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A Check List of Fungi, Bacteria, Nematodes, and Viruses Occurring in Hawaii, and Their Hosts

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A CHECK LIST OF FUNGI, BACTERIA, NEMATODES, AND VIRUSES OCCURRING IN HAWAII, AND THEIR HOSTS [1]

By G. K. Parris, Associate Professor of Plant Pathology,
University of Hawaii.

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INTRODUCTION

Stevens (64) [2/] in 1925 was the first to compile a list of the fungi present in Hawaii for a wide range of hosts, though previously Caum (15) in 1921 contributed a list of the fungi present on sugar cane. Since this time records, both published and unpublished, have accumulated, and no complete index of the organisms and their hosts is in existence.

The present publication consists of two parts: in the first part the plant hosts are listed with the organisms reported on each; in the second part the organisms are segregated into their respective systematic groups, viz., Fungi, Bacteria, Nematodes, and Viruses, and the hosts for each organism listed. The Fungi are subdivided into the Myxomycetes, Phycomycetes, Ascomycetes, Basidiomycetes, Fungi Imperfecti, and Mycelia Sterilia. Separate sections are devoted to Fungi Parasitic on Insects, and Fungi Parasitic on Nematodes. The Nematodes are subdivided into Plant Parasitic Nematodes and Predaceous Nematodes.

The nomenclature of the Myxomycetes, Phycomycetes, and Nematodes has been brought up to date. With a few exceptions, no changes in nomenclature have been made in other groups. The literature citation for each organism or host is believed to be the original record.

Thanks are due Dr. Harold L. Lyon and Dr. Royal N. Chapman, directors of the Sugar and Pineapple Experiment Stations respectively, for making available unpublished records; Dr. Harold St. John for checking botanical nomenclature; and Dr. O. N. Allen, who generously contributed unpublished records of Myxomycetes of the Hawaiian Islands.

The writer is deeply grateful to Mrs. N. D. Parris who gave so generously of her time and energy in the preparation of the card indices used in the accumulation of data, and without whose help this work would never have been attempted.

2/ Numbers in parentheses refer to citations in the bibliography.

PLANT HOSTS OF MICROORGANISMS AND VIRUSES PRESENT IN HAWAII

ABUTILON INCANUM
    Puccinia heterospora Berk. & Curt.
ABUTILON MOLLE
    Orbilia abutilonis Cash
    Puccinia heterospora Berk. & Curt.
    Schizoxylon abutilonis Cash
    Stictis radiata (L.) Pers. subsp. intermedia Speg.
ACACIA FARNESIANA
    Ravenelia siliquae Long
ACACIA KOA
    Fomes (Ganoderma) australis Fr.
    F. fasciculatus Burt
    F. fullageri (Berk.) Cke.
    Hypoxylon annulatum (Schw.) Mont.
    Lophodermium intermissum Starb.
    Meliola koae Stevens
    Nummularia guaranitica Speg.
    Schizophyllum commune Fr.
    Uromyces koae Arthur
    Xylaria rhopaloides Krs.
ACACIA sp.
    Fomes (Ganoderma) australis Fr.
    F. hawaiensis Lloyd
ACALYPHA sp.
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Diaporthe sp.
    Physalospora fusca Stevens
ACANTHOSPERMUM AUSTRALE
    Heterodera marioni (Cornu) Goodey
AGAPANTHUS UMBELLATUS
    Phoma agapanthi (Thüm.) Sacc.
AGAPANTHUS sp.
    Colletotrichum dracaenae Allesch.
AGERATUM CONYZOIDES
    Cercospora agerati Stevens
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
    Puccinia conoclinii Seym.
    Virus of yellow spot of pineapple
ALBIZZIA LEBBEK
    Phoma henningsii Sacc.
ALEURITES MOLUCCANA
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Diaporthe sp.
    Lachnea scutellata (L.) Gill

(Aleurites moluccana cont.)
Odontia sp.
Trametes corrugata (Pers.) Bres.
ALEURITES sp.
Coryne sarcoides (Jacq.) Tul.
Helotium sulphurinum Quél.
Karschia tavelinia Rehm
Mollisia peticlorum Cash
Nectria subquaternata Berk. & Br. forma farinosa Syd.
Trametes corrugata (Pers.) Bres.
Xylaria curta Fr.
X. schweinitzii Berk. & Curt.
ALLIUM CEPA
Heterodera marioni (Cornu) Goodey
Phytophthora cinnamomi Rands
P. manoana Sid.
P. palmivora Butler
P. parasitica Dastur
Pythium teratosporon Sid.
ALLIUM sp.
Bacillus carotovorus Jones
Bacterium sp.
Phoma terrestris Hansen
Macrosporium sp.
Virus of yellow spot of pineapple
ALPHITONIA PONDEROSA
Hyalocurreya sandicensis (Ell. & Ev.) Theis. & Syd.
Irene splendens Stevens
ALYXIA OLIVAEFORMIS
Amazonia psychotriae (P. Henn.) Theis.
Guignardia alyxiae Stevens
Meliola alyxiae Stevens
Trichopeltis reptans Speg.
T. rhyacoides Stevens
Trichothallus hawaiiensis Stevens
Uromyces alyxiae Arthur
AMARANTHUS GRACILIS
Heterodera marioni (Cornu) Goodey
Pratylenchus pratensis (de Man) Filipjev
Rhizoctonia sp.
AMARANTHUS HYBRIDUS
Heterodera marioni (Cornu) Goodey
AMARANTHUS SPINOSUS
Heterodera marioni (Cornu) Goodey
ANACARDIUM OCCIDENTALE
Gloeosporium sp.

ANANAS COMOSUS

Alternaria sp.
Aphanomyces sp.
Aspergillus sp.
Ceratostomella paradoxa (de Seynes) Dade
Fusarium affine Faut. & Lamb
Fusarium sp.
Heterodera marioni (Cornu) Goodey
Monilia sp.
Penicillium pinophilum Hedgcock
Phoma sp.
Phytophthora cinnamomi Rands
P. citrophthora (Sm. & Sm.) Leonian
P. palmivora Butler
P. parasitica Dastur
Pratylenchus pratensis (de Man) Filipjev
Pythium acanthophoron Sid.
P. aphanidermatum (Eds.) Fitz.
P. arrhenomanes Drechs.
Synonyms (66):
Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
N. epiphanosporon Sid.
N. hyalosticton Sid.
N. leiohyphon Sid.
N. leucosticton Sid.
N. polyandron Sid.
N. rhizophthoron Sid.
N. spaniogamon Sid.
N. thysanohyphalon Sid.
P. artotrogus (Mont.) de Bary var. macracanthum Sid.
P. ascophallon Sid.
P. debaryanum Hesse
P. butleri Subr.
P. diameson Sid.
P. euthyhyphon Sid.
P. graminicolum Subr.
P. indigoferae Butler
P. irregulare Buisman var. hawaiiense Sid.
P. mamillatum Meurs (?)
P. polycladon Sid.
P. polymorphon Sid.
P. splendens Braun var. hawaiianum Sid.
P. teratosporon Sid.
Rhizidiocystis ananasi Sid.
Rhizoctonia sp.
Rhizopus sp.
Rotylenchus multicinctus (Cobb) Filipjev
R. similis (Cobb) Filipjev

(Ananas comosus cont.)
Saccharomyces sp.
Trichoderma lignorum (Tode) Harz.
Trichoderma sp.
Verticillium sp. (heterocladum ?)
Virus of Commelina nudiflora
Virus of yellow spot of pineapple

ANTIDESMA PLATYPHYLLUM
Pestalozzia sp.

ANTIRRHINUM MAJUS
Heterodera marioni (Cornu) Goodey
Phytophthora parasitica Dastur

APIUM GRAVEOLENS VAR. DULCE
Septoria apii (Br. & Cav.) Chester
S. apii-graveolentis Dorogin

ARACHIS HYPOGAEA
Cercospora personata (Berk. & Curt.) Ell.
Heterodera marioni (Cornu) Goodey
Phyllosticta sp.
Sclerotium rolfsii Sacc.
Septogloeum arachidis Racib.

ARCTIUM LAPPA
Cercospora arctii Stevens

ARTOCARPUS INCISA
Colletotrichum artocarpi Delacr.
Mycosphaerella artocarpi Stevens & Young
Orbilia epipora (Nyl.) Karst.
Phyllosticta artocarpi Speg.
Rhizopus sp.

ASPARAGUS OFFICINALIS VAR. ALTIS
Cercospora asparagi Sacc.
Fusarium sp.

AVENA FATUA
Heterodera marioni (Cornu) Goodey

AVENA SATIVA
Heterodera marioni (Cornu) Goodey
Puccinia coronata (rhamni) Cda.
Rotylenchus multicinctus (Cobb) Filipjev
Ustilago avenae (Pers.) Jens.

BACOPA SP.
Heterodera marioni (Cornu) Goodey

BAMBUSA VULGARIS
Mosaic

BAMBUSA SP.
Lageniforma bambusae Plunkett

BARRINGTONIA ASIATICA
Gloeosporium barringtoniae Stevens & Young
Phoma barringtoniae Cke. & Massee
BEGONIA SP.
Heterodera marioni (Cornu) Goodey
BETA VULGARIS
Cercospora beticola Sacc.
Heterodera marioni (Cornu) Goodey
BETA VULGARIS VAR. CICLA
Heterodera marioni (Cornu) Goodey
BIDENS PILOSA
Heterodera marioni (Cornu) Goodey
Virus of yellow spot of pineapple
BIDENS PILOSA VAR. RADIATA
Cercospora megalopotamica Speg.
BIDENS SP.
Heterodera marioni (Cornu) Goodey
Phytophthora parasitica Dastur
BILBERGIA SP.
Pythium arrhenomanes Drechs.
Nematosporangoum leucosticton Sid.
BRASSICA CAMPESTRIS
Albugo candida (Pers.) Kuntze
Heterodera marioni (Cornu) Goodey
Rhizoctonia sp.
BRASSICA OLERACEA
Alternaria brassicae (Berk.) Sacc.
Bacterium sp.
Heterodera marioni (Cornu) Goodey
BRASSICA OLERACEA VAR. BOTRYTIS
Alternaria brassicae (Berk.) Sacc.
Heterodera marioni (Cornu) Goodey
BRASSICA OLERACEA VAR. CAPITATA
Alternaria brassicae (Berk.) Sacc.
Bacterium campestre (Pamm.) EFS.
Heterodera marioni (Cornu) Goodey
Phoma lingam (Tode) Desm.
BRASSICA PEKINENSIS
Heterodera marioni (Cornu) Goodey
Mosaic
BRASSICA RAPA
Alternaria brassicae (Berk.) Sacc.
Heterodera marioni (Cornu) Goodey
Rhizoctonia sp.
BRIGHAMIA SP.
Heterodera marioni (Cornu) Goodey

BROMUS CATHARTICUS
Ustilago bromivora (Tul.) Fisch. de Waldh.
BROMUS SECALINUS
Heterodera marioni (Cornu) Goodey
BROUSSAISIA SP.
Trichothallus hawaiiensis Stevens

CAJANUS CAJAN
Heterodera marioni (Cornu) Goodey
Phytophthora cinnamomi Rands
P. palmivora Butler
P. parasitica Dastur
Pythium arrhenomanes Drechs.
Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
N. hyphalosticton Sid.
N. polyandron Sid.
P. artotrogus (Mont.) de Bary var. macracanthum Sid.
P. debaryanum Hesse
P. diameson Sid.
P. irregulare Buisman var. hawaiiense Sid.
P. splendens Braun var. hawaiianum Sid.
P. teratosporon Sid.
Rhizoctonia sp.
Rotylenchus similis (Cobb) Filipjev
Sclerotium rolfsii Sacc.
CALLISTEPHUS CHINENSIS
Fusarium sp. (conglutinans var. callistephi ?)
Septoria callistephi Gloyer
Virus of yellow spot of pineapple
CALONYCTION ACULEATUM
Ramularia ipomoeae Stevens
Sphaerulina ipomoeae Stevens
CANAVALIA ENSIFORMIS
Fusicoccum canavaliac (no author given)
Heterodera marioni (Cornu) Goodey
Pythium artotrogus (Mont.) de Bary var. macracanthum Sid.
P. debaryanum Hesse
P. diameson Sid.
P. irregulare Buisman var. hawaiiense Sid.
P. splendens Braun var. hawaiianum Sid.
CANAVALIA GLADIATA
Heterodera marioni (Cornu) Goodey
CANAVALIA sp.
Gloeosporium canavaliae Syd.
Septoria canavaliae Lyon
CANNA EDULIS
Heterodera marioni (Cornu) Goodey
Rotylenchus similis (Cobb) Filipjev

CANNA INDICA
    Mosaic
CAPSICUM FRUTESCENS
    Bacterium vesicatorium Doidge
    Fusarium sp.
    Gloeosporium sp.
    Heterodera marioni (Cornu) Goodey
    Virus of yellow spot of pineapple
CAREX WAHUENSIS
    Uredo hawaiiensis Arthur
CARICA PAPAYA
    Heterodera marioni (Cornu) Goodey
    Phytophthora palmivora Butler
    P. parasitica Dastur
    Pythum aphanidermatum (Eds.) Fitz. var. hawaiiensis Sid.
    P. araiosporon Sid.
    P. chamaihyphon Sid.
    P. complectens Braun
CASIMIROA EDULIS
    Phyllosticta casimiroae Stevens & Weedon
CASSIA BICAPSULARIS
    Tryblidiella rufula (Spreng.) Sacc.
CASSIA LESCHENAULTIANA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
CASSIA OCCIDENTALIS
    Heterodera marioni (Cornu) Goodey
    Oidium sp.
    Pratylenchus pratensis (de Man) Filipjev
CASSIA TORA
    Heterodera marioni (Cornu) Goodey
CATTLEYA sp.
    Macrophoma cattleyicola P. Henn.
CENCHRUS ECHINATUS
    Heterodera marioni (Cornu) Goodey
CENCHRUS ECHINATUS var. HILLEBRANDIANUS
    Puccinia cenchri Diet. & Holw.
CENTELLA ASIATICA
    Heterodera marioni (Cornu) Goodey
    Septoria sp.
CEODEA UMBELLIFERA
    Echidnodes pisoniae Stevens & Ryan
CERASTIUM sp.
    Septoria cerastii Rob. & Desm.
CEREUS sp.
    Gloeosporium cerei Passer.

CHEIRODENDRON GAUDICHAUDII
    Irene cheirodendronis Stevens
CHENOPODIUM ALBUM
    Heterodera marioni (Cornu) Goodey
CHLORIS GAYANA
    Heterodera marioni (Cornu) Goodey
CHRYSANTHEMUM INDICUM
    Puccinia chrysanthemi Rose
    Septoria rostrupii Sacc. & Syd.
CHRYSOPHYLLUM CAINITO
    Gloeosporium sp.
CIBOTIUM CHAMISSOI
    Exioconidium cibotii Plunkett
    Yoshinagella nuda Stevens
    Y. polymorpha Lyon var. pauciseta Stevens
CIBOTIUM MENZIESI
    Dasyscypha javanica Penz. & Sacc.
    Sphaerulina cibotii Stevens & Guba
    Yoshinagella polymorpha Lyon
CIBOTIUM sp.
    Helminthosporium cibotii Stevens
    Holotium cremeum Stevens
    Lachnum gleicheniae Cash
    Pezizella chrysostigma (Fr.) Sacc.
    Stictis radiata (L.) Pers.
CITRULLUS VULGARIS
    Colletotrichum lagenarium (Pass.) Ell. & Hals.
    Fusarium sp. (niveum ?)
    Heterodera marioni (Cornu) Goodey
    Mosaic
CITRUS AURANTIFOLIA
    Gloeosporium limetticolum Clausen
    Penicillium italicum Wehmer
    Phytophthora citrophthora (Sm. & Sm.) Leonian
CITRUS AURANTIUM
    Colletotrichum gloeosporioides Penz.
    Heterodera marioni (Cornu) Goodey
CITRUS LIMONIA
    Colletotrichum sp.
    Heterodera marioni (Cornu) Goodey
CITRUS SINENSIS
    Heterodera marioni (Cornu) Goodey
CITRUS sp.
    Bacterium citri (Hasse) Jehle
    Sphaceloma fawcettii Jenk.

CLADIUM ANGUSTIFOLIUM
- Lophodermium arundinaceum (Schrad.) Chev.
- Meliola cyperi Pat.
- Pestalozzia sp.
- Trichopeltis reptans Speg.
- Trichothallus hawaiiensis Stevens

CLADIUM MEYENII
- Aulographella baumeae Stevens & Ryan
- Meliola cyperi Pat.
- Pestalozzia sp.
- Trichopeltis reptans Speg.

CLAOXYLON SANDWICENSE
- Asterina ildefonsiae (Rehm) Theis.
- Meliola morbosa Stevens

CLERMONTIA KAKEANA (?)
- Septoria clermontiae Stevens & Young

CLERMONTIA MULTIFLORA
- Amazonia psychotriae (P. Henn.) Theis.
- Trichopeltis reptans Speg.

CLERMONTIA OBLONGIFOLIA
- Calothyriopeltis clermontiae Stevens & Ryan

CLERMONTIA sp.
- Amazonia psychotriae (P. Henn.) Theis.
- Asterina clermontiae Stevens & Ryan
- Clypeolella clermontiae Stevens & Ryan
- Meliola lobeliae Stevens
- Septoria clermontiae Stevens & Young
- Trichopeltis reptans Speg.
- Trichothallus hawaiiensis Stevens

COCCULUS FERRANDIANUS
- Echidnodella cocculi Stevens & Ryan

COCOS NUCIFERA
- Melanconium sp.
- Pestalozzia sp.
- Phytophthora palmivora Butler

CODIAEUM MOLUCCANUM
- Phyllosticta codiaei Stevens & Young

COFFEA ARABICA
- Cercospora coffeicola Berk. & Curt.
- Heterodera marioni (Cornu) Goodey

COFFEA sp.
- Capnodium sp.
- Gloeosporium sp.

COLEUS sp.
- Heterodera marioni (Cornu) Goodey

COLOCASIA ESCULENTA
- Bacillus carotovorus Jones
- Cladosporium sp.
- Heterodera marioni (Cornu) Goodey

(Colocasia esculenta cont.)
- Phyllosticta colocasiophila Weedon
- Phytophthora colocasiae Rac.
- Pythium debaryanum Hesse (?)
- Pythium sp.
- Sclerotium rolfsii Sacc.

COMMELINA NUDIFLORA
- Heterodera marioni (Cornu) Goodey
- Mosaic
- Pratylenchus pratensis (de Man) Filipjev
- Pythium arrhenomanes Drechs.
  - Nematosporangium spaniogamon Sid.

CONVOLVULUS ARVENSIS
- Heterodera marioni (Cornu) Goodey

COPROSMA sp.
- Actinodothidopsis coprosmae Stevens
- Amazonia psychotriae (P.Henn.) Theis.

CORDYLINE TERMINALIS
- Capnodiopsis sp.
- Phyllosticta cordylinophila Young
- Virus of yellow spot of pineapple

COREOPSIS sp.
- Oidium sp.

CORTADERIA ARGENTEA
- Apiospora montagnei Sacc.

CROTALARIA INCANA
- Phytophthora palmivora Butler
- P. parasitica Dastur

CROTALARIA SALTIANA
- Heterodera marioni (Cornu) Goodey

CROTALARIA SPECTABILIS
- Cercospora demetrioniana Wint.
- Mosaic

CROTALARIA USARAMOENSIS
- Heterodera marioni (Cornu) Goodey

CROTALARIA sp.
- Fusarium vasinfectum Atk.
- Heterodera marioni (Cornu) Goodey
- Phytophthora palmivora Butler
- P. parasitica Dastur

CRYPTOCARYA MANNII
- Meliola peleae Stevens

CUCUMIS MELO
- Colletotrichum lagenarium (Pass.) Ell. & Halst.
- Heterodera marioni (Cornu) Goodey
- Mosaic
- Pseudoperonospora cubensis (Berk. & Curt.) Rostew.

CUCUMIS SATIVUS
    Heterodera marioni (Cornu) Goodey
    Mosaic
    Pseudoperonospora cubensis (Berk. & Curt.) Rostew.
CUCURBITA PEPO
    Heterodera marioni (Cornu) Goodey
    Mosaic
    Pseudoperonospora cubensis (Berk. & Curt.) Rostew.
CUPRESSUS MACROCARPA
    Pestalozzia funerea Desm.
    Phomopsis sp.
    Sporonema sp.
CYANEA ANGUSTIFOLIA
    Mycosphaerella cyaneae Stevens & Young
CYANEA sp.
    Trichopeltis reptans Speg.
CYNODON DACTYLON
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
    Puccinia cynodontis Lacroix
    Ustilago sp.
CYPERUS ROTUNDUS
    Heterodera marioni (Cornu) Goodey
    Rotylenchus similis (Cobb) Filipjev
CYPERACEAE
    Metasphaeria cumana Sacc. & Speg.
    Trichothallus hawaiiensis Stevens
CYRTANDRA CORDIFOLIA
    Irene cyrtandrae Stevens
CYRTANDRA LESSONIANA
    Irene cyrtandrae Stevens

DAHLIA sp.
    Oidium sp.
    Phomopsis achilleae (Sacc.) v. Höhn.
DAUCUS CAROTA
    Heterodera marioni (Cornu) Goodey
DAUCUS CAROTA var. SATIVA
    Cercospora apii carotae Pass.
    Heterodera marioni (Cornu) Goodey
    Sclerotium rolfsii Sacc.
DELPHINIUM sp.
    Heterodera marioni (Cornu) Goodey
    Sclerotium rolfsii Sacc.
DESMODIUM TORTUOSUM
    Heterodera marioni (Cornu) Goodey

DIANELLA SANDWICENSIS
- Colletotrichum dianellae Stevens & Young
- Meliola gregoriana Stevens
- Mosaic
- Mycosphaerella dianellae Stevens & Weedon
- Phaeosphaerella dianellae Stevens
- Pirostoma dianellae Stevens & Young

DIANTHUS CARYOPHYLLUS
- Fusarium sp.
- Heterodera marioni (Cornu) Goodey
- Septoria dianthi Desm.
- Uromyces caryophullinus (Schr.) Wint.

DIANTHUS sp.
- Pestalozzia sp.

DIGITARIA PRURIENS
- Puccinia oahuensis Ell. & Ev.

DIGITARIA SANGUINALIS
- Heterodera marioni (Cornu) Goodey
- Pratylenchus pratensis (de Man) Filipjev

DIGITARIA VIOLASCENS
- Heterodera marioni (Cornu) Goodey

DIOSPYROS HILLEBRANDII
- Asterinella mabae Stevens & Ryan

DIOSPYROS SANDWICENSIS
- Asterina aspidii Theis.
- Asterinella mabae Stevens & Ryan
- Echidnodella mabae Stevens & Ryan
- Meliola sp.

DODONAEA VISCOSA
- Meliola lyoni Stevens

DRACAENA AUREA
- Coniothyrium dracaenae Stevens & Weedon
- Leptosphaeria dracaenae S. Cam.
- Meliola dracaenae Stevens

DRACAENA DRACO
- Phyllosticta draconis Berk.

DRYMARIA CORDATA
- Virus of yellow spot of pineapple

DUBAUTIA LAXA
- Graphium dubautiae Stevens & Weedon

DUBAUTIA sp.
- Echidnodella raillardiae Stevens & Ryan

ELAPHOGLOSSUM sp.
    Pestalozzia sp.
    Trichopeltis reptans Speg.
    Trichothallus hawaiiensis Stevens
ELEUSINE INDICA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
EMILIA COCCINEA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
EMILIA SONCHIFOLIA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
    Sclerotium rolfsii Sacc.
    Virus of yellow spot of pineapple
EMILIA sp.
    Mosaic
    Virus of yellow spot of pineapple
ERAGROSTIS VARIABILIS
    Phyllochora graminis (Pers.) Fuckel
ERECHTITES HIERACIFOLIA
    Heterodera marioni (Cornu) Goodey
ERECHTITES VALERIANIFOLIA
    Heterodera marioni (Cornu) Goodey
    Virus of yellow spot of pineapple
ERECHTITES sp.
    Phyllosticta erechtitis Stevens & Young
ERIGERON CANADENSIS
    Heterodera marioni (Cornu) Goodey
    Virus of yellow spot of pineapple
ERIGERON sp.
    Oidium sp.
ERIOBOTRYA JAPONICA
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
ERYTHRINA MONOSPERMA
    Patellaria atrata (Hedw.) Fr.
    Stagonospora erythrinae Stevens & Young
EUCALYPTUS GLOBULUS
    Pestalozzia sp.
EUCALYPTUS ROBUSTA
    Harknessia hawaiiensis Stevens & Young
EUCALYPTUS sp.
    Botryosphaeria ribis chromogena Shear, Stevens & Wilcox
    Diaporthe sp.
    Fomes (Ganoderma) australis Fr.
    Lembosia eucalypti Stevens & Dixon
EUGENIA MALACCENSIS
    Pestalozzia sp.

EUGENIA SANDWICENSIS
    Meliola hawaiiensis Stevens
    Mycosphaerella eugeniae Rehm
EUGENIA sp.
    Mycosphaerella eugeniae Rehm
EUPATORIUM sp.
    Davincia helios Penz. & Sacc.
EUPHORBIA CLUSIAEFOLIA
    Amazonia psychotriae (P. Henn.) Theis.
    Questieria euphorbiae G. Arnaud
    Uredo stevensii Arthur
EUPHORBIA HOOKERI
    Puccinia velata (Ell. & Ev.) Arthur
EUPHORBIA MULTIFORMIS
    Puccinia velata (Ell. & Ev.) Arthur
EUPHORBIA SERPHYLLIFOLIA (prostrata?)
    Uromyces proeminens (DC.) Pass.
EUPHORBIA sp.
    Oidium sp.
    Uredo stevensii Arthur

FICUS CARICA
    Cercospora bolleana (Thüm.) Speg.
    Rhizopus sp.
FICUS ELASTICA
    Trametes corrugata (Pers.) Bres.
FRAGARIA sp.
    Mycosphaerella fragariae (Tul.) Lindau
FREYCINETIA ARBOREA
    Gibberella lagerheimii Rehm
    Mycosphaerella freycinetiae Stevens
    Peltella freycinetiae Stevens & Ryan
    Phyllachora freycinetiae Stevens
    Scynesia atkinsonii Stevens & Ryan
    Trichothallus hawaiiensis Stevens
FREYCINETIA sp.
    Clypeosphaeria stevensii Syd.
    Melanomma clypeatum (Sacc. & Pav.) Berk.
    Mollisia petiolorum Cash

GAHNIA GAUDICHAUDII
    Meliola cyperi Pat.
GAHNIA LEPTOSTACHYA
    Meliola cyperi Pat.
GALINSOGA PARVIFLORA
    Heterodera marioni (Cornu) Goodey
    Virus of yellow spot of pineapple
GERANIUM ARBOREUM
    Puccinia callaquensis Neger

GERANIUM GLABRATUM
    Puccinia leveillei Mont. (P. geranii-silvatici Karst.)
GLADIOLUS sp.
    Bacterium marginatum McCulloch
GLEICHENIA EMARGINATA
    Phytophthora cinnamomi Rands
GLEICHENIA GLAUCA
    Dasyschypha ulei (Wint.) Sacc.
    Leptothyrium gleicheniae Stevens & Young
GLEICHENIA LINEARIS
    Helminthosporium gleicheniae Stevens & Glick
    Phytophthora cinnamomi Rands
GLEICHENIA sp.
    Dasyscypha ulei (Wint.) Sacc.
    Helotium cremeum Cash
    Lachnum gleicheniae Cash
    Leptothyrium gleicheniae Stevens & Young
GLYCINE SOJA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
GOMPHOCARPUS PHYSOCARPUS
    Heterodera marioni (Cornu) Goodey
GOSSYPIUM sp.
    Diaporthe sp.
    Glomerella gossypii Edgerton
    Sphaeropsis malorum Peck
GOULDIA TERMINALIS
    Meliola kaduae Stevens
    M. sandwicensis Ell. & Ev.
GOULDIA TERMINALIS var. CORIACEA
    Meliola kaduae Stevens
    M. sandwicensis Ell. & Ev.
    Septoria gouldiae Stevens & Young
GOULDIA TERMINALIS var. ELONGATA and var. MACROCARPA
    Meliola sandwicensis Ell. & Ev.
GOULDIA TERMINALIS var. TYPICA f. EUTYPICA
    Asterina gouldiae Stevens & Ryan
    Dendrophoma gouldiae Stevens & Plunkett
    Meliola sandwicensis Ell. & Ev.
    Pluriporus gouldiae Stevens & Ryan
GOULDIA sp.
    Enthallopycnidium gouldiae Stevens
    Meliola kaduae Stevens
    M. sandwicensis Ell. & Ev.
    Mycosphaerella kaduae Stevens & Young
    Septoria hawaiiensis Stevens & Plunkett
    Sphaeropsis gouldiae Stevens & Plunkett

GRAMINEAE
    Crepidotus rhizomorphus Burt
    Fuligo septica (L.) Gmelin
    Scirrhia lophodermioides Ell. & Ev.
    Trichopeltis reptans Speg.
GUNNERA PETALOIDEA
    Harknessia gunnerae Stevens & Young
    Mycosphaerella hawaiiensis Stevens & Young

HEDYCHIUM CORONARIUM
    Mycosphaerella hedychii Stevens & Young

HELIANTHUS ANNUUS
    Heterodera marioni (Cornu) Goodey
    Pythium irregulare Buisman var. hawaiiense Sid.
    P. splendens Braun var. hawaiianum Sid.
HELICONIA sp.
    Phyllosticta heliconiae Stevens & Young
HEMEROCALLIS FULVA
    Ceratostomella paradoxa (de Seynes) Dade
    Phytophthora sp.
    Sclerotium rolfsii Sacc.
HEMEROCALLIS sp.
    Phomopsis achilleae (Sacc.) v. Höhn.
HETEROPOGON CONTORTUS
    Puccinia versicolor Diet. & Holw.
    Sphacelotheca monilifera (Ell. & Ev.) Clint.
HIBISCUS ESCULENTUS
    Heterodera marioni (Cornu) Goodey
    Verticillium sp.
HIBISCUS SABDARIFFA
    Botryosphaeria ribis chromogena Shear, Stevens & Wilcox
    Diaporthe sp.
    Fusarium radicicola Wollen.
    Heterodera marioni (Cornu) Goodey
    Phoma macularis Desm.
HIBISCUS TILIACEUS
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Diaporthe sp.
    Diplodia natalensis Evans
    Mollisia petiolorum Cash
    Patellaria atrata (Hedw.) Fr.
    Physalospora fusca Stevens
HIBISCUS sp.
    Heterodera marioni (Cornu) Goodey
    Microthyriella hibisci Stevens
    Xylaria sp.

HIPPEASTRUM sp.
    Mosaic
HOLCUS sp.
    Entyloma crastophilum Sacc.
    Puccinia coronata Cda. (P. rhamni Wettst.)
HORDEUM VULGARE
    Heterodera marioni (Cornu) Goodey
    Ustilago hordei (Pers.) Kell. & Sw.
HYDROCOTYLE VERTICILLATA
    Puccinia hydrocotyles (Link) Cke.
HYPOCHAERIS RADICATA
    Ditylenchus dipsaci (Kühn) Filipjev

ILEX ANOMALA
    Asterinella humiriae (P. Henn.) Theis.
INDIGOFERA SUFFRUTICOSA
    Heterodera marioni (Cornu) Goodey
    Pratylenchus pratensis (de Man) Filipjev
IPOMOEA BATATAS
    Diaporthe batatatis (Ell. & Halst.) Harter & Field
    Fusarium solani (Mart.) Sacc.
    Heterodera marioni (Cornu) Goodey
    Monilochaetes infuscans Halst.
    Pythium arrhenomanes Drechs.
        Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
        N. hyphalosticton Sid.
        N. leucosticton Sid.
        N. polyandron Sid.
        N. rhizophthoron Sid.
        N. spaniogamon Sid.
        N. thysanohyphalon Sid.
    P. artotrogus (Mont.) de Bary var. macracanthum Sid.
    P. debaryanum Hesse
    P. diameson Sid.
    P. irregulare Buisman var. hawaiiense Sid.
    P. splendens Braun var. hawaiianum Sid.
    Rhizopus nigricans Ehrenb.
    Rotylenchus similis (Cobb) Filipjev
    Septoria bataticola Taub.
IPOMOEA INDICA
    Albugo ipomoeae-panduranae (Schw.) Swing.
    Heterodera marioni (Cornu) Goodey
IPOMOEA PES-CAPRAE
    Cercospora alabamensis Atk.

JUSSIAEA VILLOSA
Guignardia jussiaeae Stevens

KADUA GLOMERATA
Polystomella kaduae Stevens & Ryan
Trichopeltis reptans Speg.
KADUA GRANDIS
Mycosphaerella kaduae Stevens & Young
Septoria gouldiae Stevens & Young
KADUA KNUDSENII
Meliola kauaiensis Stevens
M. sandwicensis Ell. & Ev.
KADUA sp.
Heterodera marioni (Cornu) Goodey
Meliola kaduae Stevens
M. kauaiensis Stevens
M. sandwicensis Ell. & Ev.
Mycosphaerella kaduae Stevens & Young
KORTHALSELLA sp.
Meliola visci Stevens

LABORDIA sp.
Amazonia psychotriae (P. Henn.) Theis.
LACTUCA SATIVA
Bacterium sp. (vitians?)
Heterodera marioni (Cornu) Goodey
Septoria lactucae Peck
LANTANA CAMARA
Diaporthe sp.
Physalospora fusca Stevens
Pratylenchus pratensis (de Man) Filipjev
Sclerodcrris lantanae Cash

LANTANA sp.
Patellaria atrata (Hedw.) Fr.
Schizoxylon insigne (De N.) Rehm
LATHYRUS ODORATUS
Fusarium sp.
Glomerella cingulata (Stonem.) S. and v.S.
LEGUMINOSEAE
Rhizobium leguminosarum Frank
LEUCAENA GLAUCA
Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
Diaporthe sp.
Sphaeropsis gouldiae Stevens & Plunkett
Tryblidiella rufula (Spreng.) Sacc.

LILIUM LONGIFLORUM
    Heterodera marioni (Cornu) Goodey
    Mosaic
LITCHI CHINENSIS
    Gloeosporium sp.
LOBELIA sp.
    Amazonia psychotriae (P. Henn.) Theis.
    Asterina fimbriata Kalch. & Cke.
    A. lobeliae Stevens & Ryan
    Calothyriopeltis metrosideri Stevens & Ryan
LOCHNERA sp.
    Phytophthora parasitica Dastur
LUPINUS HIRSUTUS
    Fusarium sp.
    Heterodera marioni (Cornu) Goodey
LYCOPERSICON ESCULENTUM
    Alternaria solani (El. & Mart.) Jones & Grout
    Colletotrichum sp.
    Fern leaf (cucumber mosaic)
    Heterodera marioni (Cornu) Goodey
    Mosaic
    Phoma destructiva Plow. emend. Jamieson
    Phytophthora cinnamomi Rands
    P. infestans (Mont.) de Bary
    P. palmivora Butler
    P. parasitica Dastur
    Pratylenchus pratensis (de Man) Filipjev
    Septoria lycopersici Speg.
    Virus of yellow spot of pineapple

MACADAMIA TERNIFOLIA
    Gloeosporium sp.
MANGIFERA INDICA
    Antennellina hawaiiensis Mendoza
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Chaetothyrium mangiferae Mendoza
    Diaporthe sp.
    Erinella longispora Karst.
    Gloeosporium sp.
    Glomerella cingulata (Stonem.) S. & v.S.
    Hypoxylon effusum Nit.
    Orbilia epispora (Nyl.) Karst.
    Phaeosphaerella mangiferae Stevens & Weedon
    Polyporus gilvus Schw.
    Trametes corrugata (Pers.) Bres.
MANIHOT ESCULENTA
    Cercospora sp.
    Gloeosporium sp.
    Heterodera marioni (Cornu) Goodey

MANIHOT GLAZIOVII
Heterodera marioni (Cornu) Goodey
MARANTA DICHOTOMA
Phyllosticta marantaceae P. Henn.
MEDICAGO DENTICULATA
Heterodera marioni (Cornu) Goodey
MEDICAGO SATIVA
Heterodera marioni (Cornu) Goodey
Pseudopeziza medicaginis (Lib.) Sacc.
Uromyces medicaginis Pass.
MELIA AZEDARACH
Phytophthora parasitica Dastur
METROSIDEROS COLLINA subsp. POLYMORPHA
Amazonia ohianus Stevens
Arcyria cinerea (Bull.) Pers.
Dasyscypha citrino-alba (Penz. & Sacc.) Cash
Diatrype princeps Penz. & Sacc.
Meliolina haplochaeta Syd.
M. sydowiana Stevens
Metasphaeria hawaiiensis Stevens & Young
Mycosphaerella metrosideri Stevens & Young
Nummularia mauritanica Berk. & Cke.
Trichopeltis reptans Speg.
Trichothallus hawaiiensis Stevens
METROSIDEROS MACROPUS
Meliolina sydowiana Stevens
METROSIDEROS sp.
Asterina rickii Theis.
Calothyriopeltis metrosideri Stevens & Ryan
Penzigia globosum (Fr.) Rehm
MICROLEPIA sp.
Ramularia microlepiae Stevens
MIMOSA PUDICA
Heterodera marioni (Cornu) Goodey
MODIOLA CAROLINIANA
Cercospora althaeina Sacc.
MOMORDICA BALSAMINA
Heterodera marioni (Cornu) Goodey
MOMORDICA CHARANTIA
Cercospora echinocystis Ell. & Mart.
MORINDA CITRIFOLIA
Chaetothyrium hawaiiense Mendoza
Phaeosaccardinula morindae Mendoza
MUCUNA GIGANTEA
Phytophthora cinnamomi Rands
P. palmivora Butler
P. parasitica Dastur

MUSA CAVENDISHII
- Fusarium cubense EFS.
- Gloeosporium sp.
- Heterodera marioni (Cornu) Goodey
- Mosiac

MUSA SAPIENTUM
- Bacterium solanacearum EFS.
- Pythium arrhenomanes Drechs.
  - Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
  - N. hyphalosticton Sid.
  - N. polyandron Sid.
  - N. rhizophthoron Sid.

MUSA sp.
- Fusarium vasinfectum Atk.
- Gloeosporium musarum Cooke and Massee
- Guignardia musae Stevens
- .Pestalozzia sp.
- Phoma musae Carp.
- Phyllosticta musae Stevens & Young
- P. musicola Stevens & Young

NEPHROLEPIS EXALTATA
- Ramularia nephrolepis Stevens

NERIUM OLEANDER
- Diaporthe sp.
- Phyllosticta nerii West.
- Sphaeropsis gouldiae Stevens & Plunkett

NICANDRA PHYSALODES
- Heterodera marioni (Cornu) Goodey

NICOTIANA GLAUCA
- Virus of yellow spot of pineapple

NICOTIANA TABACUM
- Bacterium solanacearum EFS.
- Cercospora nicotianae Ell. & Ev.
- Heterodera marioni (Cornu) Goodey
- Mosaic
- Virus of yellow spot of pineapple

NICOTIANA sp.
- Virus of yellow spot of pineapple

NOTHOPANAX sp.
- Colletotrichum peregrunum Pass.

OPUNTIA sp.
- Diplodia opuntiae Sacc.

ORYZA SATIVA
- Helminthosporium sp.
- ,Piricularia grisea (Cke.) Sacc.
- Pythium graminicolum Subr.

OSMANTHUS SANDWICENSIS
- Asterinella intensa (Cke. & Mass.) Theis.
- Aulacostroma osmanthi Stevens & Ryan
- Calothyriella osmanthi Stevens & Ryan
- Calothyrium osmanthi Stevens & Ryan
- Meliola osmanthis Sydow emend. Stevens

OSTEOMELES ANTHYLLIDIFOLIA
- Diaporthe sp.
- Physalospora obtusa (Schw.) Cke. (P. malorum (Peck) Shear)

OXALIS CORNICULATA
- Heterodera marioni (Cornu) Goodey

OXALIS MARTIANA
- Heterodera marioni (Cornu) Goodey
- Pratylenchus pratensis (de Man) Filipjev

PAEDERIA FOETIDA
- Coleosporium paederiae Diet.

PALMAE
- Meliola palmicola Wint.

PANAX sp.
- Diaporthe sp.
- Diplodia natalensis Evans

PANDANUS ODORATISSIMUS
- Botryosphaeria ribis chromogena Shear, Stevens & Wilcox
- Diaporthe sp.
- Melanconium pandani Lév.
- Schizochora pandani Stevens

PANICUM NEPHELOPHILUM
- Puccinia esclavensis Diet. & Hol.

PANICUM PURPURASCENS
- Helminthosporium sp.
- Pythium arrhenomanes Drechs.
  - Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
  - N. epiphanosporon Sid.
  - N. hyalosticton Sid.
  - N. leiohyphon Sid.
  - N. leucosticton Sid.
  - N. polyandron Sid.
  - N. rhizophthoron Sid.
  - N. spaniogamon Sid.
  - N. thysanohyphalon Sid.
- P. artotrogus (Mont.) de Bary var. macracanthum Sid.
- P. diameson Sid.
- Uromyces leptodermus Syd.

PASPALUM CONJUGATUM
- Leptosphaeria proteispora Speg.
- Sorosporium paspali McAlp.

PASPALUM DILATATUM
- Claviceps paspali Stevens & Hall
- Sorosporium paspali McAlp.

PASPALUM ORBICULARE
Claviceps paspali Stevens & Hall
Pratylenchus pratensis (de Man) Filipjev
Puccinia levis (huberi) (Sacc. and Bizz.) Magn.
Sorosporium paspali McAlp.
PASSIFLORA EDULIS
Colletotrichum passiflorae Stevens & Young
PASSIFLORA LAURIFOLIA
Colletotrichum passiflorae Stevens & Young
PASSIFLORA sp.
Botrytis sp.
Heterodera marioni (Cornu) Goodey
PELEA BARBIGERA
Meliola peleae Stevens
PELEA CINEREA
Meliola juddiana Stevens
M. peleae Stevens
PELEA CLUSIAEFOLIA
Meliola juddiana Stevens
PELEA ELLIPTICA
Meliola juddiana Stevens
M. peleae Stevens
PELEA HAWAIIENSIS
Meliola juddiana Stevens

PELEA KAUAIENSIS
Trichopeltis reptans Speg.
PELEA PARVIFOLIA
Meliola juddiana Stevens
PELEA ROTUNDIFOLIA
Hexagonella peleae Stevens & Guba
Meliola juddiana Stevens
M. peleae Stevens
PELEA SANDWICENSIS
Meliola juddiana Stevens
M. peleae Stevens
PELEA sp.
Gloeosporium peleae Stevens
Meliola juddiana Stevens
M. peleae Stevens
Phragmocapnias smilicina Mendoza
Trichopeltis reptans Speg.
Trichothallus hawaiiensis Stevens
PEPEROMIA sp.
Trichopeltis reptans Speg.

PERROTTETIA SANDWICENSIS
    Actinodothis perrottetiae Stevens
    Amazonia perrottetiae Stevens
PERSEA AMERICANA
    Gloeosporium sp.
    Glomerella cingulata (Stonem.) S. & v.S.
PERSEA sp.
    Fusarium radicicola Wollen.
PETUNIA sp.
    Bacterium solanacearum EFS.
PHASEOLUS AUREUS
    Pythium arrhenomanes Drechs.
        Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
        N. hyphalosticton Sid.
        N. polyandron Sid.
        N. rhizophthoron Sid.
    P. artotrogus (Mont.) de Bary var. macracanthum Sid.
    P. irregulare Buisman var. hawaiiense Sid.
    P. splendens Braun var. hawaiianum Sid.
PHASEOLUS LATHYROIDES
    Heterodera marioni (Cornu) Goodey
PHASEOLUS LIMENSIS
    Heterodera marioni (Cornu) Goodey
PHASEOLUS LUNATUS
    Phoma subcircinata Ell. & Ev.
PHASEOLUS VULGARIS
    Bacterium phaseoli EFS.
    Cercospora cruenta Sacc.
    Colletotrichym lindemuthianum (Sacc. & Magn.) Briosi & Cav.
    Diaporthe phaseolorum (Cke. & Ell.) Sacc.
    Heterodera marioni (Cornu) Goodey
    Isariopsis griseola Sacc.
    Phyllosticta sp.
    Uromyces phaseoli typica Arthur
PHOENIX DACTYLIFERA
    Graphiola phoenicis (Moug.) Poit.
PHYLLOCACTUS SP.
    Colletotrichum phyllocacti Ell. & Ev.
PHYLLOSTEGIA FLORIBUNDA
    Trichothallus hawaiiensis Stevens
PHYLLOSTEGIA sp.
    Astorina phyllostegiae Stevens & Ryan
PHYSALIS PERUVIANA
    Irene inermis (Kalch. & Cke.) Theis. & Syd.
PIPTURUS ALBIDUS
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Cercospora pipturi Stevens & Glick
    Diaporthe sp.
    Irene triloba (Wint.) Stevens

PIPTURUS sp.
    Cyphella villosa (Pers.) Karst.
PISUM SATIVUM
    Ascochyta sp.
    Fusarium sp.
    Heterodera marioni (Cornu) Goodey
    Virus of yellow spot of pineapple
PITHECELOBIUM sp.
    Polyporus gilvus Schw.
PITTOSPORUM sp.
    Rhabdospora pittospori Stevens & Young
PLANTAGO sp.
    Cercospora plantaginis Sacc.
PLATYDESMA CAMPANULATA
    Clypeoseptoria rockii Stevens & Young
POA ANNUA
    Puccinia epiphylla (L.) Wettst.
    Septoria poa~trivialis Cocconi
POLYGONUM GLABRUM
    Ustilago utriculosa (Nees) Tul.
POLYGONUM sp.
    Puccinia polygoni-amphibii Pers.
POLYPODIACEAE
    Fuligo septica (L.) Gmelin
    Helotium cremeum Cash
    Pezizella chrysostigma (Fr.) Sacc.
PORTULACA GRANDIFLORA
    Dichtomophthora portulacae Mehr. & Fitz.
PORTULACA LUTEA
    Dichtomophthora portulacae Mehr. & Fitz.
PORTULACA OLERACEA
    Dichotomophthora portulacae Mehr. & Fitz.
    Heterodera marioni (Cornu) Goodey
    Rhizoctonia sp.
POTHOS sp.
    Leptothyrium pothi Weedon
    Phyllosticta aricola Bubak
    P. pothicola Weedon
PRITCHARDIA sp.
    Mollisia cinerea (Batsch) Karst
PROSOPIS CHILENSIS
    Phoma musae Carp.
    Rhytidhysterium prosopidis Peck
PROSOPIS sp.
    Diaporthe sp.
    Sphaeropsis gouldiae Stevens & Plunkett
    S. malorum Peck
    Tryblidiella rufula (Spreng.) Sacc.
PRUNUS PERSICA
    Phyllosticta circumscissa Cke.
    Tranzschelia pruni-spinosa (Pers.) Diet.

PSIDIUM GUAJAVA
Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
Diaporthe sp.
Gloeosporium sp.
Limaciniella psidii Mendoza
Orbilia leucostigma Fr.
Trichopeltis reptans Speg.
PSIDIUM sp.
Aschersonia marginata Ell. & Ev.
PTERIDIUM AQUILINUM
Uredinopsis pteridis Diet. & Holw.

RAPHANUS SATIVUS
Albugo candida (Pers.) Kuntze
Heterodera marioni (Cornu) Goodey
RAPHANUS SATIVUS var. LONGIPINNATUS
Heterodera marioni (Cornu) Goodey
RAPHANUS sp.
Cercospora sp.
Mosaic
Virus of yellow spot of pineapple
RHEUM RHAPONTICUM
Phyllosticta straminella Bres.
RHUS SEMIALATA
Dasyscypha citrino-alba (Penz. & Sacc.) Cash
RHYNCHOSPORA LAVARUM
Uromyces rhyncosporae El.
RHYNCHOSPORA SCIERIOIDES
Meliola cyperi Pat.
RICHARDIA SCABRA
Heterodera marioni (Cornu) Goodey
Phytophthora cinnamomi Rands
P. parasitica Dastur
Virus of yellow spot of pineapple
RICINUS COMMUNIS
Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
Diaporthe sp.
Phytophthora cinnamomi Rands
P. manoana Sid.
P. palmivora Butler
P. parasitica Dastur
Pythium ascophallon Sid.
P. polycladon Sid.
ROCKIA SANDWICENSIS
Echidnodes pisoniae Stevens & Ryan
ROLLANDIA CRISPA
Septoria rollandiae Stevens & Young

ROLLANDIA HUMBOLDTIANA
Limaciniopsis rollandiae Mendoza
ROSA sp.
Diplocarpon rosae Wolf
Mycosphaerella rosigena Ell. & Ev.
Oidium sp.
Phragmidium disciflorum (Tode) James
Phyllosticta sp.
RUBUS HAWAIIENSIS
Anomothallus erraticus Stevens
Irene puiggarii (Speg.) Doidge
Trichothallus hawaiiensis Stevens
RUBUS ROSAEFOLIUS
Stictis hawaiensis Cash
RUBUS VILLOSUS
Kuehneola uredinis (Link) Arthur

SACCHARUM OFFICINARUM
Allantospora radicicola Wakk.
Aspergillus sp.
Bacterium albilineans Ashby
Bacterium rubilineans (Lee, Purdy, Barnum, & Martin) Elliott
Capnodium sp.
Ceratostomella paradoxa (de Seynes) Dade
Cercospora vaginae Krug. (?)
Chlorotic streak virus
Cladosporium herbarum (Pers.) Link
Clathrus columnatus Bosc.
Cochliobolus stenospilus (Carp.) M. & Y. (Helminthosporium stenospilum Drechs.)
Colletotrichum falcatum Went
Curvularia lunata (Wakk.) Boed.
Dictyophora indusiata (Vent. ex Fr.) Fisch.
Fusarium moniliforme Sheld.
Gibberella fujikuroi (Saw.) Wollen.
G. fujikuroi (Saw.) Wollen. var. Subglutinans Edw.
Gnomonia iliau Lyon
Graphium sp.
Helminthosporium sacchari (v. Breda de Haan) Butler
Heterodera marioni (Cornu) Goodey
Himantia stellifera Johns. (?)
Hormiactella sacchari Johns. (?)
Ithyphallus rubicundus (Bosc) Fisch.
Leptosphaeria sacchari v. Breda de Haan
Leptosphaeria sp.
Lophodermium sacchari Lyon
Macrosporium graminum Cke.
Marasmius sacchari Wakk.
Microspira northii Carp. & Bom. (juice)

(Saccharum officinarum cont.)

Mosaic
Mycosphaerella striatiformans Cobb
Nectria sp.
Neurospora sitophila Shear & Dodge
Nigrospora oryzae (Berk. & Br.) Petch (Basisporium gallarum Moll.)
Odontia saccharicola Burt
Penicillium glaucum Link
Phyllosticta hawaiiensis Caum (P. sorghina Sacc.)
Pleocyta sacchari (Mass.) Petr. & Syd. (Melànconium sacchari Massee)
Pratylenchus pratensis (de Man) Filipjev
Pythium arrhenomanes Drechsler
Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
N. epiphanosporon Sid.
N. hyalosticton Sid.
N. leiohyphon Sid.
N. leucosticton Sid.
N. polyandron Sid.
N. rhizophthoron Sid.
N. spaniogamon Sid.
N. thysanohyphalon Sid.
P. artotrogus (Mont.) de Bary var. macracanthum Sid.
P. debaryanum Hesse
P. diameson Sid.
P. graminicolum Subr. (?)
P. splendens Braun var. hawaiianum Sid.
Rhizoctonia sp.
Rhizopus sp.
Rotylenchus similis (Cobb) Filipjev
Schizophyllum commune Fr.
Sclerotium rolfsii Sacc.
Sclerotium sp.
Strumella sacchari Cke.
Trichoderma lignorum (Tode) Harz.
Verticillium sp.

SADLERIA sp.
Dasyscypha sadleriae Stevens & Young
Lycoperdon sp.
Pezizella chrysostigma (Fr.) Sacc.
Stictis radiata (L.) Pers.

SAGITTARIA SAGITTIFOLIA
Cercospora sagittariae Ell. & Ev.
Pestalozzia sp.

SALVIA COCCINEA
Septoria salviae-pratensis Pass.

SAMANEA SAMAN
Phyllosticta pithecolobii E. Young

SCAEVOLA CHAMISSONIANA
Irene scaevolicola Stevens
Mycosphaerella scaevolae Stevens & Young
Phyllosticta scaevolae Ell. & Ev.
Pleospora scaevolae Stevens & Young

SCAEVOLA GLABRA
Amazonia psychotriae (P.Henn.) Theis.
Irene scaevolicola Stevens
Mycosphaerella scaevolae Stevens & Young
SCAEVOLA MOLLIS
Irene scaevolicola Stevens
Mycosphaerella scaevolae Stevens & Young
SCAEVOLA sp.
Amazonia psychotriae (P. Henn.) Theis.
Calloriopsis gelatinosa (Ell. & Marts.) Syd.
Calothyriopeltis scaevolae Stevens & Ryan
Sarcosoma godronioides Rick
Trichothallus hawaiiensis Stevens
SCHINUS MOLLE
Botryosphaeria ribis chromogena Shear, Stevens & Wilcox
Diaporthe sp.
SCHINUS TEREBINTHIFOLIUS
Botryosphaeria ribis chromogena Shear, Stevens & Wilcox
Diaporthe sp.
SCIRPUS sp.
Uromyces scirpi (Cast.) Burr.
SETARIA VERTICILLATA
Heterodera marioni (Cornu) Goodey
Pratylenchus pratensis (de Man) Filipjev
SIDA RHOMBIFOLIA
Leptothyrium sidae Stevens & Young
SIDA SPINOSA
Leptothyrium sidae Stevens & Young
SIDA sp.
Colletotrichum malvarum (Braun & Casp.) Southworth
SIDEROXYLON RHYNCOSPERMUM
Pauahia sideroxyli Stevens
SIDEROXYLON SANDWICENSE
Meliola sideroxyli Stevens
SINAPIS CERNUA
Albugo candida (Pers.) Kuntze
SMILAX SANDWICENSIS
Macrophoma smilacina (Pk.) Berl. & Vogl.
Trichopeltis reptans Speg.
SMILAX sp.
Phragmocapnias smilicina Mendoza
Trichothallus hawaiiensis Stevens
SOLANUM MELONGENA
Cercospora melongenae Welles
Fusarium sp.
Heterodera marioni (Cornu) Goodey
Phomopsis vexans (Sacc. & Syd.) Harter
Phyllosticta hortorum Speg.
Septoria lycopersici Speg.
Virus of yellow spot of pineapple
SOLANUM NODIFLORUM (nigrum)
Heterodera marioni (Cornu) Goodey
Virus of yellow spot of pineapple

SOLANUM TUBEROSUM
- Actinomyces scabies (Thax.) Güssow
- Alternaria solani (Ell. & Mart.) Jones & Grout
- Bacillus atrosepticus van Hall
- Bacterium solanacearum EFS.
- Fusarium coeruleum (Lib.) Sacc.
- F. oxysporum Schlecht.
- F. radicicola Wollen.
- Heterodera marioni (Cornu) Goodey
- Mosaic
- Phytophthora infestans (Mont.) de Bary
- Pythium arrhenomanes Drechs.
  - Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
  - N. epiphanosporon Sid.
  - N. hyphalosticton Sid.
  - N. leiohyphon Sid.
  - N. leucosticton Sid.
  - N. polyandron Sid.
  - N. rhizophthoron Sid.
  - N. spaniogamon Sid.
  - N. thysanohyphalon Sid.
- P. debaryanum Hesse
- P. diameson Sid.
- Rhizoctonia solani Kühn
- Rugose mosaic
- Sclerotium rolfsii Sacc.
- Spongospora subterranea (Wallr.) Johns.
- Verticillium sp.

SOLANUM sp.
- Gibberella pulicaris (Fr.) Sacc.

SONCHUS OLERACEUS
- Alternaria sonchi Stevens
- Heterodera marioni (Cornu) Goodey
- Pratylenchus pratensis (de Man) Filipjev

SORGHUM HALEPENSE
- Puccinia purpurea Cooke

SORGHUM VULGARE
- Heterodera marioni (Cornu) Goodey

SORGHUM sp.
- Sphacelotheca reiliana (Kühn) Clint.
- S. sorghi (Lk.) Clint.

SPINACIA OLERACEA
- Blight (virus)
- Heterodera marioni (Cornu) Goodey
- Peronospora effusa (Grev.) Rabenh.
- Pythium allantocladon Sid.
- P. ascophallon Sid.
- P. teratosporon Sid.

SPOROBOLUS ELONGATUS
    Helminthosporium ravenelii Curt. & Berk.
SPOROBOLUS POIRETII
    Helminthosporium ravenelii Curt. & Berk.
STACHYS ARVENSIS
    Virus of yellow spot of pineapple
STACHYTARPHETA DICHOTOMA
    Phoma herbarum West.
STACHYTARPHETA JAMAICENSIS
    Rhizoctonia sp.
STIZOLOBIUM DEERINGIANUM
    Heterodera marioni (Cornu) Goodey
    Phytophthora palmivora Butler
    P. parasitica Dastur
STRAUSSIA HAWAIIENSIS
    Amazonia psychotriae (P. Henn.) Theis.
STRAUSSIA KADUANA
    Amazonia psychotriae (P. Henn.) Theis.
    Meliola kaduae Stevens
STRAUSSIA MARINIANA
    Amazonia psychotriae (P. Henn.) Theis.
    Chaetothyrium straussiae Mendoza
STRAUSSIA sp.
    Amazonia psychotriae (P. Henn.) Theis.
    Lyonella neurophila Syd.
    Meloola kaduae Stevens
    Trichopeltis reptans Speg.
    Trichothallus hawaiiensis Stevens
STRELITZEA REGINAE
    Fusarium sp.
SUTTONIA KAUAIENSIS
    Actinodothis suttoniae Stevens
SUTTONIA LANAIENSIS
    Beelia suttoniae Stevens & Ryan
SUTTONIA LESSERTIANA
    Actinodothis suttoniae Stevens
    Oligostroma suttoniae Stevens
    Trichopeltis reptans Speg.
SUTTONIA SANDWICENSIS
    Calothyrium suttoniae Stevens & Ryan
SUTTONIA SP.
    Asterina suttoniae Stevens & Ryan
    Hendersonia nitida Ell. & Ev.
    Meliola sp.

TARAXACUM VULGARE
    Heterodera marioni (Cornu) Goodey
    Puccinia hieracii (Schum.) Mart. (P. taraxaci Plowr.)
    Virus of yellow spot of pineapple

TECTONA GRANDIS
Cercospora tectoniae Stevens
TEPHROSIA VOGELII
Heterodera marioni (Cornu) Goodey
TERMINALIA sp.
Mollisia petiolorum Cash
TETRAPLASANDRA HAWAIIENSIS
Scynesiopeltis tetraplasandrae Stevens & Ryan
TETRAPLASANDRA MEIANDRA
Scynesiopeltis tetraplasandrae Stevens & Ryan
TRICHOLAENA REPENS
Heterodera marioni (Cornu) Goodey
TRITICUM VULGARE
Heterodera marioni (Cornu) Goodey
Puccinia rubigo-vera (DC.) Wint. (P. clematidis Lagerh.)
Pythium arrhenomanes Drechs.
Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
N. epiphanosporon Sid.
N. hyalosticton Sid.
N. leichyphon Sid.
N. leucosticton Sid.
N. polyandron Sid.
N. rhizophthoron Sid.
N. spaniogamon Sid.
N. thysanohyphalon Sid.
P. splendens Braun var. hawaiianum Sid.
TROPAEOLUM sp.
Bacterium solanacearum EFS.

VACCINIUM RETICULATUM
Irene exilis (Syd.) Stevens
Meliola alyxiae Stevens
M. vaccinii Stevens
Pucciniastrum myrtilli (Schum.) Arthur
Trichopeltis reptans Speg.
VACCINIUM sp.
Asterina delitescens Ell. & Mart.
VANILLA FRAGRANS
Gloeosporium sp.
VERBENA BONARIENSIS
Heterodera marioni (Cornu) Goodey
Stictis stellata var. philippinensis Rehm
VERBENA sp.
Oidium sp.
VERNONIA CINERIA
Heterodera marioni (Cornu) Goodey
VICIA FABA
Heterodera marioni (Cornu) Goodey
Mosaic

(Vicia faba cont.)
    Phyllosticta sp.
    Pythium arrhenomanes Drechs.
        Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
        N. spaniogamon Sid.
    P. debaryanum Hesse
    P. diameson Sid.
    P. irregulare Buisman var. hawaiiense Sid.
    P. splendens Braun var. hawaiianum Sid.
VIGNA SESQUIPEDALIS
    Uromyces phaseoli vignae (Barclay) Arthur
VIGNA SINENSIS
    Heterodera marioni (Cornu) Goodey
    Pythium artotrogus (Mont.) de Bary var. macracanthum Sid.
    P. debaryanum Hesse
    P. splendens Braun var. hawaiianum Sid.
    Uromyces phaseoli vignae (Barclay) Arthur
VIOLA sp.
    Phyllosticta violae Desmaz.

WIKSTROEMIA ELONGATA
    Amazonia psychotriae (P. Henn.) Theis.
WIKSTROEMIA FOETIDA var. OAHUENSIS
    Amazonia psychotriae (P. Henn.) Theis.
WIKSTROEMIA PHILLYREAEFOLIA
    Amazonia psychotriae (P. Henn.) Theis.
    Botryosphaeria ribis chromogena Shear, Stevens, & Wilcox
    Diaporthe sp.
    Physalospora fusca Stevens
WIKSTROEMIA UVA -URSI
    Pucciniastrum wikstroemiae Arthur
WIKSTROEMIA sp.
    Amazonia psychotriae (P. Henn.) Theis.
    Calloriopsis gelatinosa (Ell. & Mart.) Syd.

XANTHIUM SACCHARATUM
    Oidium sp.
    Puccinia xanthii Schw.

ZEA MAYS
    Heterodera marioni (Cornu) Goodey
    Pythium arrhenomanes Drechs.
        Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid.
        N. epiphanosporon Sid.
        N. hyphalosticton Sid.
        N. leiohyphon Sid.
        N. leucosticton Sid.

(Zea mays cont.)

(Pythium arrhenomanes Drechs. cont.)

N. polyandron Sid.

N. rhizophthoron Sid.

N. spaniogamon Sid.

N. thysanohyphalon Sid.

P. debaryanum Hesse

P. diameson Sid.

P. teratosporon Sid.

Ustilago zeae (Beckm.) Unger

ZINGIBER OFFICINALE

Coniothyrium zingiberi Stevens & Atienza

Fusarium sp.

Pythium sp.

ZINGIBER ZERUMBET

Phyllosticta zingiberis Stevens & Ryan

ZINNIA PAUCIFLORA

Heterodera marioni (Cornu) Goodey

ZINNIA sp.

Heterodera marioni (Cornu) Goodey

Oidium sp.

MICROORGANISMS AND VIRUSES PRESENT IN HAWAII AND THEIR HOSTS

Numbers in parentheses refer to the bibliography. Where all of the recorded hosts of an organism can be attributed to a single investigator, the citation is given after the organism rather than repeated for each host. Where no host is given, the organism is found growing on one or more of the following: dead branches, twigs, leaves, wood, bark, trunks, stems, logs, stumps, roots, dung, earth, etc.

The following symbols have been used:

I -- Organism shown to be a host by inoculation.

R -- Recognized as present in Hawaii, but not reported.

FUNGI

Myxomycetes (1)

ALWISIA BOMBARDA Berk. & Br.
ARCYRIA CARNEA G. Lister
ARCYRIA CINEREA (Bull.) Pers.
ARCYRIA CINEREA (Bull.) Pers. var. DIGITATA G. Lister
ARCYRIA DENUDATA (L.) Sheldon
ARCYRIA FERRUGINEA Sauter
ARCYRIA NUTANS (Bull.) Grev.
ARCYRIA VIRESCENS G. Lister

BADHAMIA AFFINIS Rost.
BADHAMIA AFFINIS Rost. var. ORBICULATA Rex.
BADHAMIA CAPSULIFERA (Bull.) Berk.
BADHAMIA GONIOSPORA Meyl.
BADHAMI MANDSURICA Skvor.
BADHAMIA NITENS Berk.
BADHAMIA UTRICULARIS (Bull.) Berk.
BADHAMIA VERSICOLOR Lister

CERATIOMYXA FRUCTICULOSA (Muell.) Macbr.
CERATIOMYXA FRUCTICULOSA (Muell.) Macbr. var. FLEXUOSA Lister
CIENKOWSKIA RETICULATA Rost.
CLASTODERMA DEBARYANUM Blytt
COMATRICHA LAXA Rost.
COMATRICHA LONGA Peck
COMATRICHA NIGRA Schroet.
COMATRICHA PULCHELLA Rost.
COMATRICHA PULCHELLA Rest. var GRACILIS G. Lister

COMATRICHA TYPHOIDES (Bull.) Rost.
CRATERIUM LEUCOCEPHALUM Ditm.
CRIBRARIA DICTYDIOIDES Cke. and Balf.
CRIBRARIA INTRICATA Schrad.
CRIBRARIA INTRICATA Schrad. var. DICTYDIOIDES (Cke. & Balf.) Lister
CRIBRARIA MICROCARPA Pers.
CRIBRARIA MINUTISSIMA Schw.
CRIBRARIA PIRIFORMIS Schrad.
CRIBRARIA TENELLA Schrad. var. CONCINNA G. Lister
CRIBRARIA VIOLACEA Rex.

DIACHAEA LEUCOPODA (Bull.) Rost.
DICTYDIUM CANCELLATUM (Batsch.) Macbr.
DIDERMA EFFUSUM Morg.
DIDERMA LYALLII Mass.
DIDERMA TESTACEUM Schrad.
DIDYMIUM CRUSTACEUM Fr.
DIDYMIUM FLEXUOSUM Yamashiro
DIDYMIUM MELANOSPERMUM (Pers.) Macbr.
DIDYMIUM NIGRIPES (Link) Fr.
DIDYMIUM NIGRIPES (Link) Fr. var. XANTHOPUS List.
DIDYMIUM PERFORATUM Yamashiro
DIDYMIUM SQUAMULOSUM Fr.

ERIONEMA AUREUM Penz.

FULIGO CINEREA Morg. var. ESCORTICATA Lister
FULIGO MUSCORUM Alb. & Schw.
FULIGO SEPTICA (L.) Gmel.

HEMITRICHIA CLAVATA (Pers.) Rost.
HEMITRICHIA LEIOTRICHA List.
HEMITRICHIA SERPULA (Scop.) Rost.
HEMITRICHIA VESPARIUM (Batsch.) Macbr.

LAMPRODERMA ARCYRIONEMA Rost.
LAMPRODERMA COLUMBINUM Pers.
LAMPRODERMA COLUMBINUM Pers. var. GRACILIS G. Lister
LAMPRODERMA SCINTILLANS (Berk. & Br.) Morg.
LYCOGALA EPIDENDRUM (Link) Fr.
LYCOGALA FLAVO-FUSCUM (Ehr.) Rost.

OPHIOTHECA WRIGHTII Berk. & Curt.

PERICHAENA CHRYSOSPERMA Lister
PERICHAENA DEPRESSA Libert.
PERICHAENA VERMICULARIS Rost.
PHYSARELLA OBLONGA Morg.

PHYSARUM AENEUM Fr.
PHYSARUM ASIATICUM Skvor.
PHYSARUM COMPRESSUM Alb. & Schw.
PHYSARUM CONTEXTUM Pers.
PHYSARUM CUTRINUM Schum.
PHYSARUM GRISEUM Skvor.
PHYSARUM LAYDIS Torr.
PHYSARUM LEUCOPUS Link.
PHYSARUM MELLEUM Mass.
PHYSARUM NEUCTEATUM Rex.
PHYSARUM NUTANS Pers.
PHYSARUM POLYCEPHALUM Schw.
PHYSARUM PSITTACINUM Ditm. var. FULVUM Lister
PHYSARUM PUSILIUM Lister
PHYSARUM ROSEUM Berk. & Br.
PHYSARUM ROSEUM Berk. & Br, var. DISCOCEPHALUM Yamashiro
PHYSARUM SERPULA Morg.
PHYSARUM SINUOSUM Weinm.
PHYSARUM VIRIDE (Bull.) Pers.

STEMONITIS AXIFERA (Bull.) Macbr.
STEMONITIS CONFLUENS Cooke & Ellis
STEMONITIS FLAVOGENITA Jahn.
STEMONITIS FUSCA Roth
STEMONITIS HERBATICA Pk.
STEMONITIS PALLIDA Wing
STEMONITIS SPLENDENS Rost.
STEMONITIS SPLENDENS Rost. var FLACCIDA Lister
STEMONITIS VIRGINIENSIS Rex.

TRICHIA ASIATICA Skvor.
TRICHIA CONTORTA Rost. var. INCONSPICUA Lister
TRICHIA PERSIMILIS Karst.
TUBIFERA FERRIGINOSA Gmel.
TUBIFERA STIPITATA Macbr.

Phycomycetes

ALBUGO CANDIDA (Pers.) Kuntze
    Brassica campestris (4)
    Raphanus sativus (49)
    Sinapis cernua (4)
ALBUGO IPOMOEAE- PANDURANAE (Schw.) Swing.
    Ipomoea indica (64)
APHANOMYCES sp.
    Ananas comosus (69)

MORTIERELLA ELASSON Sid. & Pax. (60)

PERONOSPORA EFFUSA (Grev.) Rabenh.
    Spinacia oleracea (54)
PHYTOPHTHORA CINNAMOMI Rands
    Allium cepa (59) I
    Ananas comosus (46)
    Cajanas cajan (69) I
    Gleichenia emarginata (46)
    Gleichenia linearis (69)
    Lycopersicon esculentum (46) I
    Mucuna gigantea (46) I
    Richardia scabra (69) I
    Ricinus communis (46) I
PHYTOPHTHORA CITROPHTHORA (Sm. & Sm.) Leonian (Pythiacystis citrophthora Sm. & Sm.)
    Ananas comosus (69) I
    Citrus aurantifolia (52)
PHYTOPHTHORA COLOCASIAE Racib.
    Colocasia esculenta (5)
PHYTOPHTHORA INFESTANS (Mont.) de Bary (3)
    Lycopersicon esculentum
    Solanum tuberosum
PHYTOPHTHORA MANOANA Sideris (P. palmivora Butler)
    Allium cepa (56) I
    Ricinus communis (46)
PHYTOPHTHORA PALMIVORA Butler
    Allium cepa (59)
    Ananas comosus (46)
    Cajanus cajan (69) I
    Carica papaya (56) I
    Cocos nucifera (70)
    Crotalaria incana (46) I
    Crotalaria sp. (69) I
    Lycopersicon esculentum (46) I
    Mucuna gigantea (46) I
    Richardia scabra (46) I
    Ricinus communis (46) I
    Stizolobium deeringianum (69) I
PHYTOPHTHORA PARASITICA Dastur
    Allium cepa (59)
    Ananas comosus (46)
    Antirrhinum majus (59)
    Bidens sp. (46)
    Cajanus cajan (46) I
    Carica papaya (46) I
    Crotalaria incana (46) I

(Phytophthora parasitica cont.)
Crotalaria sp. (69) I
Lochnera sp. (69)
Lycopersicon esculentum (46) I
Melia azedarach (46) I
Mucuna gigantea (46) I
Richardia scabra (46) I
Ricinus communis (46) I
Stizolobium deeringianum (69) I
PHYTOPHTHORA sp.
Hemerocallis fulva (70)
PSEUDOPERONOSPORA CUBENSIS (Berk. & Curt.) Rostew. (49)
Cucumis melo
Cucumis sativus
Cucurbita pepo
PYTHIUM ACANTHOPHORON Sid.
Ananas comosus (58)
PYTHIUM ALLANTOCLADON Sid.
Spinacia oleracea (57)
PYTHIUM APHANIDERMATUM (Eds.) Fitz.
Ananas comosus (58)
PYTHIUM APHANIDERMATUM (Eds.) Fitz. var. HAWAIIENSIS Sid.
Carica papaya (57)
PYTHIUM ARAIOSPORON Sid.
Carica papaya (57)
PYTHIUM ARRHENOMANES Drechs.
Nematosporangium arrhenomanes Drechs. var. hawaiiensis Sid. (66)
Ananas comosus (57)
Cajanus cajan (56) I
Ipomoea batatas (56) I
Musa sapientum (56) I
Panicum purpurascens (56) I
Phaseolus aureus (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Vicia faba (56) I
Zea mays (56) I
N. epiphanosporon (Subr.) Sid. (66)
Ananas comosus (57)
Panicum purpurascens (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea Mays (56) I
N. hyphalosticton Sid. (66)
Ananas comosus (57)
Cajanus cajan (56) I

(Pythium arrhenomanes Drechs. cont.)

N. hyphalosticton Sid. (66) cont.

Ipomoea batatas (57) I
Musa sapientum (57) I
Panicum purpurascens (56) I
Phaseolus aureus (57) I
Saccharum officinarum (69) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I

N. leiohyphon Sid. (66)

Ananas comosus (57)
Panicum purpurascens (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I

N. leucosticton Sid. (66)

Ananas comosus (57) I
Bilbergia sp. (57)
Ipomoea batatas (57) I
Panicum purpurascens (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I

N. polyandron Sid. (66)

Ananas comosus (57)
Cajanus cajan (56) I
Ipomoea batatas (56) I
Musa sapientum (56) I
Panicum purpurascens (56) I
Phaseolus aureus (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I

N. rhizophthoron Sid. (66)

Ananas comosus (57)
Ipomoea batatas (56) I
Musa sapientum (56) I
Panicum purpurascens (56) I
Phaseolus aureus (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I

(Pythium arrhenomanes cont.)
N. spaniogamon Sid. (66)
Ananas comosus (57)
Commelina nudiflora (57) I
Ipomoea batatas (56) I
Panicum purpurascens (56) I
Phaseolusaureus (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Vicia faba (56) I
Zea mays (56) I
N. thysanohyphalon Sid. (66)
Ananas comosus (57)
Ipomoea batatas (56) I
Panicum purpurascens (56) I
Saccharum officinarum (56) I
Solanum tuberosum (56) I
Triticum vulgare (56) I
Zea mays (56) I
PYTHIUM ARTOTROGUS (Mont.) deBary var. MACRACANTHUM Sid.
Ananas comosus (57)
Cajanus cajan (56) I
Canavalia ensiformis (58) I
Ipomoea batatas (58) I
Panicum purpurascens (58) I
Phaseolus aureus (56) I
Saccharum officinarum (58) I
Vigna sinensis (58) I
PYTHIUM ASCOPHALLON Sid.
Ananas comosus (58) I
Ricinus communis (58)
Spinacia oleracea (58)
PYTHIUM BUTLERI Subr.
Ananas comosus (57)
PYTHIUM CHAMAIHYPHON Sid.
Carica papaya (58)
PYTHIUM COMPLECTENS Braun (P. vexans deBary)
Carica papaya (58)
PYTHIUM DEBARYANUM Hesse
Ananas comosus (58)
Cajanus cajan (58) I
Canavalia ensiformis (58) I
Colocasia esculenta ? (9)
Ipomoea batatas (58) I
Saccharum officinarum (9)
Solanum tuberosum (58) I
Vicia faba (58) I
Vigna sinensis (58) I
Zea mays (58) I

PYTHIUM DIAMESON Sid.
    Ananas comosus (58)
    Cajanus cajan (56) I
    Canavalia ensiformis (56) I
    Ipomoea batatas (56) I
    Panicum purpurascens (56) I
    Saccharum officinarum (56) I
    Solanum tuberosum (56) I
    Vicia faba (56) I
    Zea mays (56) I
PYTHIUM EUTHYHYPHON Sid.
    Ananas comosus (58)
PYTHIUM GRAMINICOLUM Subr. (4)
    Ananas comosus
    Oryza sativa
    Saccharum officinarum (?)
PYTHIUM INDIGOFERAE Butler
    Ananas comosus (57) I
PYTHIUM IRREGULARE Buisman var. HAWAIIENSE Sid.
    Ananas comosus (58)
    Cajanus cajan (58) I
    Canavalia ensiformis (58) I
    Helianthus annuus (58) I
    Ipomoea batatas (58) I
    Phaseolus aureus (56) I
    Vicia faba (56) I
PYTHIUM MAMILLATUM Meurs
    Ananas comosus (61) I (?)
PYTHIUM POLYCLADON Sid.
    Ananas comosus (58) I
    Ricinus communis (58)
PYTHIUM POLYMORPHON Sid.
    Ananas comosus (58)
PYTHIUM SPLENDENS Braun var. HAWAIIANUM Sid.
    Ananas comosus (58)
    Cajanus canjan (58) I
    Canavalia ensirofmis (58) I
    Helianthus annuus (58) I
    Ipomoea batatas (58) I
    Phaseolus aureus (56) I
    Saccharum officinarum (56) I
    Triticum vulgare (58) I
    Vicia faba (58) I
    Vigna sinensis (58) I

PYTHIUM TERATOSPORON Sid.
    Allium cepa (58) I
    Ananas comosus (58) I
    Cajanus cajan (56) I
    Spinacea oleracea (58)
    Zea mays (58) I
PYTHIUM sp.
    Colocasia esculenta (4)
    Zingiber officinale (51)
RHIZIDIOCYSTIS ANANASI Sid.
    Ananas comosus (55)
RHIZOPUS NIGRICANS Ehrenb.
    Ipomoea batatas (64)
RHIZOPUS sp.
    Ananas comosus (canned) (69)
    Artocarpus incisa (70)
    Ficus carica (51)
    Saccharum officinarum (70)
SPONGOSPORA SUBTERRANEA (Wallr.)Johns.
    Solanum tuberosum (11)

Ascomycetes

ACTINODOTHIDOPSIS COMPROSMAE Stevens
    Coprosma sp. (64)
ACTINODOTHIS PERROTTETIAE Stevens
    Perrottetia sandwicensis (64)
ACTINODOTHIS SUTTONIAE Stevens (64)
    Suttonia kauaiensis
    Suttonia lessertiana
AMAZONIA OHIANUS Stevens
    Metrosideros collina subsp. polymorpha (64)
AMAZONIA PERROTTETIAE Stevens
    Perrottetia sandwicensis (64)
AMAZONIA PSYCHOTRIAE (P. Henn.) Theis. (64)
    Alyxia olivaeformis
    Clermontia multiflora
    Clermontia sp.
    Coprosma sp.
    Euphorbia clusiaefolia
    Labordia sp.
    Lobelia sp.
    Scaevola glabra
    Scaevola sp.
    Straussia hawaiiensis
    Straussia kaduana
    Straussia mariniana
    Straussia sp.

(Amazonia psychotriae (P. Henn.) Theis.cont.)
Wikstroemia elongata
Wikstroemia foetida var. oahuensis
Wikstroemia phillyreaefolia
Wikstroemia sp.
ANOMOTHALLUS ERRATICUS Stevens
Rubus hawaiiensis (64)
ANTENNEILINA HAWAIIENSIS Mendoza
Mangifera indica (64)
APIOSPORA MONTAGNEI Sacc.
Cortaderia argentea (64)
ASCOBOLUS STERCORARIUS (Bull.) Schroet. (13)
ASPERGILLUS NIGER V. Tiegh. (69)
ASPERGILLUS sp.
Ananas comosus (canned) (69)
Saccharum officinarum (70)
ASTERINA ASPIDII Theis.
Diospyros sandwicensis (64)
ASTERINA CLERMONTIAE Stevens & Ryan
Clermontia sp. (64)
ASTERINA DELITESCENS Ell. & Mart.
Vaccinium sp. (64)
ASTERINA FIMBRIATA Kalch. & Cooke
Lobalia sp. (64)
ASTERINA GOULDIAE Stevens & Ryan
Gouldia terminalis var. typica f. eutypica (64)
ASTERINA ILDEFONSIAE (Rehm) Theis.
Claoxylon sandwicense (64)
ASTERINA KAUAIENSIS Stevens & Ryan (64)
ASTERINA LOBELIAE Stevens & Ryan
Lobelia sp. (64)
ASTERINA PHYLLOSTEGIAE Stevens & Ryan
Phyllostegia sp. (64)
ASTERINA RICKII Theis.
Metrosideros sp. (64)
ASTERINA SUTTONIAE Stevens & Ryan
Suttonia sp. (64)
ASTERINELLA HUMIRIAE (P. Henn.) Theis.
Ilex anomala (64)
ASTERINELLA INTENSA (Cke.& Mass.) Theis.
Osmanthus sandwicensis (64)
ASTERINELLA MABAE Stevens & Ryan (64)
Diospyros hillebrandii
Diospyros sandwicensis

AULACOSTROMA OSMANTHI Stevens & Ryan
    Osmanthus sandwicensis (64)
AULOGRAPHELLA BAUMEAE Stevens & Ryan
    Cladium meyenii (64)

BEELIA SUTTONIAE Stevens & Ryan
    Suttonia lanaiensis (64)
BOTRYOSPHAERIA RIBIS CHROMOGENA Shear, Stevens & Wilcox
    Acalypha sp. (65)
    Aleurites moluccana (65)
    Eriobotrya japonica (51)
    Eucalyptus sp. (65)
    Hibiscus sabdariffa (65)
    Hibiscus tiliaceus (65)
    Leucaena glauca (65)
    Mangifera indica (65)
    Pandanus odoratissimus (65)
    Pipturus albidus (65)
    Psidium guajava (65)
    Ricinus communis (65)
    Schinus molle (65)
    Schinus terebinthifolius (65)
    Wikstroemia phillyreaefolia (65)

CALLORIOPSIS GELATINOSA (Ell.& Mart.) Syd.
    Wikstroemia sp. (11)
CALOTHYRIELLA OSMANTHI Stevens & Ryan
    Osmanthus sandwicensis (64)
CALOTHYRIOPELTIS CLERMONTIAE Stevens & Ryan
    Clermontia oblongifolia (64)
CALOTHYRIOPELTIS METROSIDERI Stevens & Ryan
    Lobelia sp. (64)
    Metrosideros sp. (64)
CALOTHYRIOPELTIS SCAEVOLAE Stevens & Ryan
    Scaevola sp.
CALOTHYRIUM OSMANTHI Stevens & Ryan
    Osmanthus sandwicensis (64)
CALOTHYRIUM SUTTONIAE Stevens & Ryan
    Suttonia sandwicensis (64)
CAPNODIOPSIS sp.
    Cordyline terminalis (70)
CAPNODIUM sp.
    Coffea sp. (4)
    Saccharum officinarum (46)
CERATOSTOMELLA PARADOXA (deSeynes) Dade
    Ananas comosus (29)
    Hemerocallis fulva (70)

(Ceratostomella paradoxa (deSeynes) Dade cont.)
    Saccharum officinarum (18)
CHAETOTHYRIUM HAWAIIENSE Mendoza
    Morinda citrifolia (64)
CHAETOTHYRIUM MANGIFERAE Mendoza
    Mangifera indica (64)
CHAETOTHYRIUM STRAUSSIAE Mendoza
    Straussia mariniana (64)
CHLOROSPLENIUM AERUGINASCENS (Nyl.) Karst. (11)
CLAVICEPS PASPALI Stevens & Hall (50)
    Paspalum dilatatum
    Paspalum orbiculare
CLYPEOLELLA CLERMONTIAE Stevens & Ryan
    Clermontia sp. (64)
CLYPEOSPHAERIA STEVENSII Syd.
    Freycinetia sp. (64)
COCHLIOBOLUS STENOSPILUS (Carp.) M. & Y.
    Saccharum officinarum (7)
CORYNE SARCOIDES (Jacq.) Tul.
    Aleurites sp. (11)

DASYSCYPHA CITRINO-ALBA (Penz. & Sacc.) Cash (11)
    Metrosideros collina subsp. polymorpha
    Rhus semialata
DASYSCYPHA JAVANICA Penz. & Sacc.
    Cibotium menziesi (11)
DASYCYPHA SADLERIAE Stevens & Young
    Sadleria sp. (64)
DASYSCYPHA ULEI (Wint.) Sacc. (64)
    Gleichenia glauca
    Gleichenia sp.
DAWINCIA HELIO Penz. & Sacc.
    Eupatorium sp. (11)
DIAPORTHE BATATATIS (Ell. & Halst.) Harter & Field
    Ipomoea batatas (8)
DIAPORTHE PHASEOLORUM (Cke. & Ell.) Sacc.
    Phaseolus vulgaris (4)
DIAPORTHE sp. (65)
    Acalypha sp.
    Aleurites moluccana
    Eucalyptus sp.
    Gossypium sp.
    Hibiscus sabdariffa
    Hibiscus tiliaceus
    Lantana camara
    Leucaena glauca
    Mangifera indica
    Nerium oleander
    Osteomeles anthyllidifolia

(Diaporthe sp. cont.)
Panax sp.
Pandanus odoratissimus
Pipturus albidus
Prosopis sp.
Psidium guajava
Ricinus communis
Schinus molle
Schinus terebinthifolius
Wikstroemia phillyreaefolia
DIATRYPE PRINCEPS Penz. & Sacc.
Metrosideros collina subsp. polymorpha (64)
DIPLOCARPON ROSAE Wolf
Rosa sp. (50)

ECHIDNODELLA COCCULI Stevens & Ryan
Cocculus ferrandianus (64)
ECHIDNODELLA MABAE Stevens & Ryan
Diospyros sandwicensis (64)
ECHIDNODELLA RAILLARDIAE Stevens & Ryan
Dubautia sp. (54)
ECHIDNODES PISONIAE Stevens & Ryan (64)
Ceodes umbellifera
Rockia sandwicensis
ENTHALLOPYCNIDIUM GOULDIAE Stevens
Gouldia sp. (64)
ERINELLA LONGISPORA Karst.
Mangifera indica (64)
ERYSIPHE CICHORACEARUM DC. (64)
ERYSIPHE POLYGONI DC. (64)

GIBBERELLA FUJIKUROI (Saw.) Wollen.
Saccharum officinarum (30)
GIBBERELLA FUJIKUROI (Saw.) Wollenw. var. SUBGLUTINANS Edw.
Saccharum officinarum (66)
GIBBERELLA LAGERHEIMII Rehm
Freycinetia arborea (64)
GIBBERELLA PULICARIS (Fr.) Sacc.
Solanum sp. (64)
GLOMERELLA CINGULATA (Stonem.) S. & v.S.
Lathyrus odoratus (50)
Mangifera indica (4)
Persea americana (4)
GLOMERELLA GOSSYPII Edgerton
Gossypium sp. (4)

GNOMONIA ILIAU Lyon
    Saccharum officinarum (38)
GUIGNARDIA ALYXIAE Stevens
    Alyxia olivaeformis (64)
GUIGNARDIA JUSSIAEAE Stevens
    Jussiaea villosa (64)
GUIGNARDIA MUSAE Stevens
    Musa sp. (64)

HELOTIUM CREMEUM Cash (11)
    Cibotium sp.
    Gleichenia sp.
    Polypodiaceae
HELOTIUM SULPHURINUM Quél.
    Aleurites sp. (11)
HEXAGONELLA PELEAE Stevens & Guba
    Pelea rotundifolia (64)
HUMARIA GRANULATA (Bull.) Quél. (11)
HYALOCURREYA SANDICENSIS (Ell. & Ev.) Theis. & Syd.
    Alphitonia ponderosa (19, p. 135)
HYPOXYLON ANNULATUM (Schw.) Mont.
    Acacia koa (64)
HYPOXYLON ARCHERI Berk. (64)
HYPOXYLON EFFUSUM Nit.
    Mangifera indica (64)
HYPOXYLON MARGINATUM (Schw.) Berk. (64)
HYPOXYLON PLACENTIFORME Berk. & Curt. (64)
HYPOXYLON RUBIGINOSUM (Pers.) Fr. (64)
HYPOXYLON SANDWICENSE Reich. (64)

IRENE CHEIRODENDRONIS Stevens
    Cheirodendron gaudichaudii (64)
IRENE CYRTANDRAE Stevens (64)
    Cyrtandra cordifolia
    Cyrtandra lessoniana
IRENE EXILIS (Syd.) Stevens
    Vaccinium reticulatum (64)
IRENE INERMIS (Kalch. & Cke.) Theis. & Syd.
    Physalis peruviana (64)
IRENE PUIGGARII (Speg.) Doidge
    Rubus hawaiiensis (64)
IRENE SCAEVOLICOLA Stevens (64)
    Scaevola chamissoniana
    Scaevola glabra
    Scaevola mollis

IRENE SPLENDENS Stevens
    Alphitonia ponderosa (64)
IRENE TRILOBA (Wint.) Stevens
    Pipturus albidus (64)

KARSCHIA LIGNYOTA (Fr.) Sacc. (11)
KARSCHIA TAVELINIA Rehm
    Aleurites sp. (11)

LACHNEA COPRINARIA (Cke.) Phill. (11)
LACHNEA SCUTELLATA (L.) Gill
    Aleurites moluccana (11)
LACHNUM GLEICHENIAE Cash (11)
    Gleichenia sp.
    Cibotium sp.
LAGENIFORMA BAMBUSAE Plunkett
    Bambusa sp. (64)
LEMBOSIA EUCALYPTI Stevens & Dixon
    Eucalyptus sp. (64)
LEPTOSPHAERIA DRACAENAE S. Cam.
    Dracaena aurea (64)
LEPTOSPHAERIA PROTEISPORA Speg.
    Paspalum conjugatum (64)
LEPTOSPHAERIA SACCHARI v. Breda de Haan
    Saccharum officinarum (15)
LEPTOSPHAERIA sp.
    Saccharum officinarum (11)
LIMACINIELLA PSIDII Mendoza
    Psidium guajava (64)
LIMACINIOPSIS ROLLANDIAE Mendoza
    Rollandia humboltiana (64)
LOPHODERMIUM ARUNDINACEUM (Schrad.) Chev.
    Cladium angustifolium (64)
LOPHODERMIUM INTERMISSUM Starb.
    Acacia koa (64)
LOPHODERMIUM SACCHARI Lyon
    Saccharum officinarum (40)
LYONELLA NEUROPHILA Syd.
    Straussia sp. (64)

MASSALONGIELLA CANAVALIAE Stevens & Young (64)
MELANOMMA CLYPEATUM (Sacc. & Pav.) Berk.
    Freycinetia sp. (64)

MELIOLA ALYXIAE Stevens (64)
- Alyxia olivaeformis
- Vaccinium reticulatum

MELIOLA CYPERI Pat. (64)
- Cladium angustifolium
- Cladium meyenii
- Gahnia gaudichaudii
- Gahnia leptostachya
- Rhynchospora sclerioides

MELIOLA DRACAENAE Stevens
- Dracaena aurea (64)

MELIOLA GREGORIANA Stevens
- Dianella sandwicensis (64)

MELIOLA HAWAIIENSIS Stevens
- Eugenia sandwicensis (64)

MELIOLA JUDDIANA Stevens (64)
- Pelea cinerea
- Pelea clusiaefolia
- Pelea elliptica
- Pelea hawaiiensis
- Pelea parvifolia
- Pelea rotundifolia
- Pelea sandwicensis
- Pelea sp.

MELIOLA KADUAE Stevens (64)
- Gouldia terminalis
- Gouldia terminalis var. coriacea
- Gouldia sp.
- Kadua sp.
- Straussia kaduana
- Straussia sp.

MELIOLA KAUAIENSIS Stevens (64)
- Kadua knudsenii
- Kadua sp.

MELIOLA KOAE Stevens
- Acadia koa (64)

MELIOLA LOBELIAE Stevens
- Clermontia sp. (64)

MELIOLA LYONI Stevens
- Dodonaea viscosa (64)

MELIOLA MORBOSA Stevens
- Claoxylon sandwicense (64)

MELIOLA OSMANTHI Sydow emend. Stevens
- Osmanthus sandwicensis (64)

MELIOLA PALMICOLA Wint.
- Palmae (64)

MELIOLA PELEAE Stevens (64)
- Cryptocarya mannii
- Pelea barbigera

Meliola peleae Stevens cont.)
    Pelea cinerea
    Pelea elliptica
    Pelea rotundifolia
    Pelea sandwicensis
    Pelea sp.
MELIOLA SANDWICENSIS Ell. & Ev. (64)
    Gouldia terminalis
    Gouldia terminals var. coriacea
    Gouldia terminalis var. elongata
    Gouldia terminalis var. macrocarpa
    Gouldia terminalis var. typica f. eutypica
    Gouldia sp.
    Kadua knudsenii
    Kadua sp.
MELIOLA SIDEROXYLI Stevens
    Sideroxylon sandwicense (64)
MELIOLA VACCINII Stevens
    Vacinium reticulatum (64)
MELIOLA VISCI Stevens
    Korthalsella sp. (64)
MELIOLA Sp. (64)
    Diospyros sandwicensis
    Suttonia sp.
MELIOLINA HAPLOCHAETA Syd.
    Metrosideros collina subsp. polymorpha (64)
MELIOLINA SYDOWIANA Stevens (64)
    Metrosideros collina subsp. polymorpha
    Metrosideros collina subsp. polymorpha var. incana
    Metrosideros macropus
METASPHAERIA CUMANA Sacc. & Speg.
    Cyperaceae (64)
METASPHAERIA HAWAIIENSIS Stevens & Young
    Metrosideros collina subsp. polymorpha (64)
MICROSPHAERA EUPHORBIAE (Pk.) Berk. & Curt. (64)
MICROTHYRIELLA HIBISCI Stevens
    Hibiscus sp. (64)
MOLLISIA CINEREA (Batsch) Karst.
    Pritchardia sp. (11)
MOLLISIA PETIOLORUM Cash (11)
    Aleurites sp
    Freycinetia sp. (?)
    Hibiscus tiliaceus
    Terminalia sp.
MYCOSPHAERELLA ARTOCARPI Stevens & Young
    Artocarpus incisa (64)

MYCOSPHAERELLA CYANEAE Stevens & Young
Cyanea angustifolia (64)
MYCOSPHAERELLA DIANELLAE Stevens & Weedon
Dianella sandwicensis (64)
MYCOSPHAERELLA EUGENIAE Rehm (64)
Eugenia sandwicensis
Eugenia sp.
MYCOSPHAERELLA FRAGARIAE (Tul.) Lindau
Fragaria sp. (49)
MYCOSPHAERELLA FREYCINETIAE Stevens
Freycinetia arborea (64)
MYCOSPHAERELLA HAWAIIENSIS Stevens & Young
Gunnera petaloidea (64)
MYCOSPHAERELLA HEDYCHII Stevens & Young
Hedychium coronarium (64)
MYCOSPHAERELLA KADUAE Stevens & Young (64)
Gouldia sp.
Kadua grandis
Kadua sp.
MYCOSPHAERELLA METROSIDERI Stevens & Young
Metrosideros collina subsp. polymorpha
MYCOSPHAERELLA ROSIGENA (Ell. & Ev.) Lindau
Rosa sp. (64)
MYCOSPHAERELLA SCAEVOLAE Stevens & Young (64)
Scaevola chamissoniana
Scaevola glabra
Scaevola mollis
MYCOSPHAERELLA STRIATIFORMANS Cobb
Saccharum officinarum (17)

NECTRIA SUBQUATERNATA Berk. & Br. f. FARINOSA Syd.
Aleurites sp. (64)
NECTRIA sp.
Saccharum officinarum (15)
NEUROSPORA SITOPHILA Shear & Dodge
Saccharum officinarum (15)
NUMMULARIA MAURITANICA Berk. & Cke.
Metrosideros collina subsp. polymorpha (62)

OLIGOSTROMA SUTTONIAE Stevens
Suttonia lessertiana (64)
ORBILIA ABUTILONIS Cash
Abutilon molle (11)
ORBILIA EPIPORA (Nyl.) Karst. (11)
Artocarpus incisa
Mangifera indica

ORBILIA LEUCOSTIGMA Fr.
    Psidium guajava (11)

PATELLARIA ATRATA (Hedw.) Fr. (11)
    Erythrina monosperma
    Hibiscus tiliaceus
    Lantana sp.
PAUAHIA SIDEROXYLI Stevens
    Sideroxylon rhyncospermum (64)
PELTELLA FREYCINETIAE Stevens & Ryan
    Freycinetia arborea (64)
PENICILLIUM GLAUCUM Link
    Saccharum officinarum (67)
PENICILLIUM ITALICUM Wehmer
    Citrus aurantifolia (52)
PENICILLIUM PINOPHILUM Hedgcock
    Ananas comosus (69)
PENICILLIUM sp.
    Ananascomosus (69)
    Saccharum officinarum (67)
PENZIGIA GLOBOSUM (Fr.) Rehm
    Metrosideros sp. (64)
PENZIGIA TUBERIFORMIS (Berk.) Rehm (64)
PEZIZA CLYPEATA Schw. (8)
PEZIZA GELATINOSA Hall (64)
PEZIZELLA CHRYSOSTIGMA (Fr.) Sacc. (11)
    Cibotium sp
    Polypodiaceae
    Sadleria sp.
PHAEOSACCARDINULA MORINDAE Mendoza
    Morinda citrifolia (64)
PHAEOSPHAERELLA DIANELLAE Stevens
    Dianella sandwicensis (64)
PHAEOSPHAERELLA HAWAIIENSIS Stevens & McMunn (64)
PHAEOSPHAERELLA MANGIFERAE Stevens & Weedon
    Mangifera indica (64)
PHRAGMOCAPNIAS SMILICINA Mendoza (64)
    Pelea sp.
    Smilax sp.
PHYLLACHORA FREYCINETIAE Stevens
    Freycinetia arborea (64)
PHYLLACHORA GRAMINIS (Pers.) Fuckel
    Eragrostis variabilis (64)
PHYSALOSPORA FUSCA Stevens (65)
    Acalypha sp.
    Hibiscus tiliaceus
    Lantana camara
    Wikstroemia phillyreaefolia

PHYSALOSPORA OBTUSA (Schw.) Cke. (P. malorum(Peck) Shear)
    Osteomeles anthyllidifolia (5)
PLEOSPORA SCAEVOLAE Stevens & Young
    Scaevola chamissoniana (64)
PLURIPORUS GOULDIAE Stevens & Ryan
    Gouldia terminalis var. typica f. eutypica (64)
POLYSTOMELLA KADUAE Stevens & Ryan
    Kadua glomerata (64)
PROPOLIS FAGINEA (Schrad.) Karst. (11)
PSEUDOPEZIZA MEDICAGINIS (Lib.) Sacc.
    Medicago sativa (64)
PYRONEMA OMPHALODES (Bull.) Fuckel (11)

QUESTIERIA EUPHORBIAE Arnaud
    Euphorbia clusiaefolia (64)

RHYTIDHYSTERIUM PROSOPIDIS Peck
    Prosopis chilensis (64)
ROSELLINIA CITRIFORMIS Stevens & Weedon (64)

SACCHAROMYCES sp.
    Ananas comosus (canned) (69)
SARCOSOMA GODRONIOIDES Rick (11)
    Scaevola sp.
SCHIZOCHORA PANDANI Stevens
    Pandanus odoratissimus (64)
SCHIZOXYLON ABUTILONIS Cash
    Abutilon molle (11)
SCHIZOXYLON INSIGNE (De N.) Rehm
    Lantana sp. (11)
SCIRRHIA LOPHODERMIOIDES Ell. & Ev.
    Gramineae (64)
SCLERODERRIS LANTANAE Cash
    Lantana camara (11)
SEYNESIA ATKINSONII Stevens & Ryan
    Freycinetia arborea (64)
SEYNESIOPELTIS TETRAPLASANDRAE Stevens & Ryan (64)
    Tetraplasandra hawaiiensis
    Tetraplasandra meiandra
SPHAEROTHECA HUMULI (DC.) Bur. (64)
SPHAEROTHECA PANNOSA (Wallr.) Lév. (9)
SPHAERULINA CIBOTII Stevens & Guba
    Cibotium menziesi (64)
SPHAERULINA IPOMOEAE Stevens
    Calonyction aculeatum (64)

STICTIS HAWAIIENSIS Cash
Rubus rosaefolius (11)
STICTIS RADIATIA (L.) Pers. (13)
Cibotium sp.
Sadleria sp.
STICTIS RADIATA (L.) Pers. subsp. INTERMEDIA Speg. (11)
Abutilon molle
STICTIS STELLATA var. PHILIPPINENSIS Speg. (11)
Verbena bonariensis

TRABUTIA MINIMA Stevens & Weedon (64)
TRICHOPELTIS REPTANS Speg. (64)
Alyxia olivaeformis
Cladium angustifolium
Cladium meyenii
Clermontia multiflora
Clermontia sp.
Cyanea sp.
Elaphoglossum sp.
Gramineae
Kadua glomerata
Metrosideros collina subsp. polymorpha
Pelea kauaiensis
Pelea sp.
Peperomia sp.
Psidium guajava
Smilax sandwicensis
Straussia sp.
Suttonia lessertiana
Vaccinium reticulatum
TRICHOPELTIS RHYACOIDES Stevens
Alyxia olivaeformis .(64)
TRICHOTHALLUS HAWAIIENSIS Stevens (64)
Alyxia olivaeformis
Broussaisia sp.
Cladium angustifolium
Clermontia sp.
Cyperaceae
Elaphoglossum sp.
Freycinetia arborea
Metrosideros collina subsp. polymorpha
Pelea sp.
Phyllostegia floribunda
Rubus hawaiiensis
Scaevola sp.
Smilax sp.
Straussia sp.
TRYBLIDIELLA RUFULA (Spreng.) Sacc. (11)
Cassia bicapsularia
Leucaena glauca
Prosopis sp.

USTULINA VULGARIS Tul. (2)
USTULINA ZONATA (Lév.) Sacc. (64)

XENOLOPHIUM LEVE Syd. (64)
XENOLOPHIUM VERRUCOSUM Syd. (64)
XYLARIA APICULATA Cooke (64)
XYLARIA CURTA Fr. (64)
XYLARIA GIGANTEA (Zipp. and Lév.) Fr. (64)
XYLARIA HYPOXYLON (L.) Grev. (64)
XYLARIA MORCHELLIFORMIS Rehm (64)
XYLARIA MULTIPLEX (Kuntz & Fr.) Berk. & Curt. (64)
XYLARIA RHOPALOIDES Krs. (64)
XYLARIA SCHWEINITZII Berk. & Curt. (64)
XYLARIA TUBEROSA (Pers.) Cooke (64)
XYLARIA sp.
    Hibiscus sp. (41)

YOSHINAGELLA NUDA Stevens
    Cibotium chamissoi (64)
YOSHINAGELLA POLYMORPHA Lyon
    Cibotium chamissoi (64)
YOSHINAGELLA POLYMORPHA Lyon var. PAUCISETA Stevens
    Cibotium chamissoi (64)

Basidiomycetes

AGARICUS CAMPESTRIS L. (71)
AGARICUS sp. (4)
ALEURODISCUS PERIDENIAE (Berk. & Br.) Henn. (2)
AURICULARIA AURICULA-JUDAE (L.) Schrt. (2)
AURICULARIA NIGRESCENS (Swartz) Farl. (2)
AURICULARIA TENUIS (Lév.) Farl. (2)

CLATHRUS COLUMNATUS Bosc.
    Saccharum officinarum (15)
COLEOSPORIUM PAEDERIAE Diet.
    Paederia foetida (64)
COLLYBIA VELUTIPES Curt. (71)
CORTICIUM ARACHNOIDEUM Berk.
    Cibotium sp. (2)
CORTICIUM GRANULARE Burt (2)
CREPIDOTUS FULVOTOMENTOSUS Peck (2)
CREPIDOTUS RHIZOMORPHUS Burt
    Gramineae (4)

CYPHELLA VILLOSA (Pers.) Karst.
    Pipturus sp. (2)

DAEDALIA SP. (18)
DICTYOPHORA INDUSIATA (Vent. ex Fr.) Fisch. (15)

ENTYLOMA CRASTOPHILUM Sacc.
    Holcus sp. (64)
EPITHELE HYDNOIDES Burt
    Cibotium sp. (2)

FOMES (GANODERMA) APPLANATUS (Pers.) Wallr.) (2)
FOMES (GANODERMA) AUSTRALIS Fr. (2)
    Acacia koa
    Acacia sp.
    Eucalyptus sp.
FOMES (GANODERMA) FASCIATUS (Sw.) Fr. (2)
FOMES FASCICULATUS Burt
    Acacia koa (2)
FOMES FULLAGERI (Berk.) Cooke
    Acacia koa (2)
FOMES HAWAIENSIS Lloyd
    Acacia sp. (2)
FOMES KORTHALSII (Lév.) Cooke (2)
FOMES RIMOSUS Berk. (2)
FOMES ROBUSTUS Karst. (2)

GRAPHIOLA PHOENICIS (Moug.) Poit.
    Phoenix dactylifera (64)

HYDNUM sp. (4)
HYMENOCHAETE CINNAMOMEA (Pers.) Bres. (2)
HYMENOCHAETE SPRETA Peck (2)
HYMENOCHAETE TENUISSIMA Berk. (2)

ITHYPHALLUS RUBICUNDUS (Bosc) Fish. (15)

KUEHNEOLA UREDINIS (Link) Arth. (64)
    Rubus villosus

LASCHIA CUCULLATA (Jungh.)Bres. (2)
LEPIOTA CEPAESTIPES Sower. (18)
LEPIOTA XYLOPHILA Peck (2)
LYCOPERDON CEPAEFORME (Bull.) Lloyd (2)
LYCOPERDON GEMMATUM Batsch. (2)
LYCOPERDON WRIGHTII B. & C. (2)
LYCOPERDON sp.
    Sadleria sp. (2)

MARASMIUS SACCHARI Wakk.
    Saccharum officinarum (15)
MARASMIUS SACCHARI Wakk. var. HAWAIIENSIS Cobb
    Saccharum officinarum
MYCENASTRUM CORIUM (Guers.) Desv. (2)
MYRIOSTOMA COLIFORME (Dicks.) Cda. (2)

NAUCORIA TRISCOPODA Fr. (2)

ODONTIA SACCHARICOLA Burt
    Saccharum officinarum (15)
ODONTIA WRIGHTII (Berk. & Curt.) Pat. (2)
ODONTIA sp.
    Aleurites moluccana (2)

PHOLIOTA ADIPOSA Fr. (71)
PHOLIOTA MARGINATA (Batsch.) Fr. (2)
PHRAGMIDIUM DISCIFLORUM (Tode) James
    Rosa sp. (64)
PLEUROTUS FLABELLATUS Berk. & Br. (2)
PLEUROTUS OSTREATUS Jacq. (2)
PLEUROTUS sp. (2)
POLYPORUS ARCULARIUS (Batsch.) Fr. (2)
POLYPORUS CHIONEUS Fr. (2)
POLYPORUS DRYOPHILUS Berk. (2)
POLYPORUS FLABELLARIS Lloyd (2)
POLYPORUS GILVUS Schw. (2)
    Mangifera indica
    Pithecelobium sp.
POLYPORUS LIGNOSUS Kl. (2)
POLYPORUS SULPHUREUS (Bull.) Fr. (2)
POLYSTICTUS FLOCCOSUS (Jungh.) Fr. (2)
POLYSTICTUS HIRSUTUS (Wulf.) Fr. (2)
POLYSTICTUS FIBULA Fr. (2)
POLYSTICTUS MICROLOMA Lév. (2)
POLYSTICTUS PINSITUS Fr. (2)
PORIA FASCICULATA Burt (2)
PORIA sp. (2)
PSATHYRA sp. (2)
PUCCINIA CALLAQUENSIS Neger
    Geranium arboreum (64)
PUCCINIA CENCHRI Diet. & Holw.
    Cenchrus echinatus var.hillebrandianus (64)
PUCCINIA CHRYSANTHEMI Rose
    Chrysanthemum indicum (64)

PUCCINIA CONOCLINII Seym.
    Ageratum conyzoides (64)
PUCCINIA CORONATA Cda. (P. rhamni Wettst.) (64)
    Avena sativa
    Holcus sp.
PUCCINIA CYNODONTIS Lacroix
    Cynodon dactylon (64)
PUCCINIA EPIPHYLLA (L.) Wettst.
    Poa annua (64)
PUCCINIA ESCLAVENSIS Diet. & Holw.
    Panicum nephelophilum (64)
PUCCINIA HETEROSPORA Berk. & Curt. (64)
    Abutilon incanum
    Abutilon molle
PUCCINIA HIERACII (Schum.) Mart. (P. taraxaci Plowr.)
    Taraxacum vulgare (64)
PUCCINIA HYDROCOTYLES (Link) Cke.
    Hydrocotyle verticillata (64)
PUCCINIA LEVEILLEI Mont. (P. geranii-silvatici Karst.)
    Geranium glabratum (64)
PUCCINIA LEVIS (Sacc. & Bizz.) Magn. (P. huberi P. Henn.)
    Paspalum orbiculare (64)
PUCCINIA OAHUENSIS Ell. & Ev.
    Digitaria pruriens (64)
PUCCINIA POLYGONI-AMPHIBII Pers.
    Polygonum sp. (64)
PUCCINIA PURPUREA Cke.
    Sorghum halepense (64)
PUCCINIA RUBIGO-VERA (DC.) Wint. (P. clematidis Lagerh.)
    Triticum vulgare (64)
PUCCINIA VELATA (Ell. & Ev.) Arth. (64)
    Euphorbia hookeri
    Euphorbia multiformis
PUCCINIA VERSICOLOR Diet. & Holw.
    Heteropogon contortus (64)
PUCCINIA XANTHII Schw.
    Xanthium saccharatum (64)
PUCCINIASTRUM MYRTILLI (Schum.) Arth.
    Vaccinium reticulatum (64)
PUCCINIASTRUM WIKSTROEMIAE Arthur
    Wikstroemia Uva-ursi (64)

RAVENELIA SILIQUAE Long
    Acacia farnesiana (64)

SCHIZOPHYLLUM COMMUNE Fr.
    Acacia koa (2)
    Saccharum officinarum (15)

SCHIZOXYLON ABUTILONIS Cash
    Abutilon molle (11)
SCHIZOXYLON INSIGNE (De N.) Rehm
    Lantana sp. (11)
SOROSPORIUM PASPALI McAlp.
    Paspalum conjugatum (64)
    Paspalum dilatatum (50)
    Paspalum orbiculare (64)
SPHACELOTHECA MONILIFERA (Ell. & Ev.) Clint.
    Heteropogon contortus (64)
SPHACELOTHECA REILIANA (Kühn) Clint.
    Sorghum sp. (64)
SPHACELOTHECA SORGHI (L.) Clint.
    Sorghum sp. (64)
STEREUM ELEGANS (Mey.) Lloyd (2)
STEREUM LATUM Cke. & Mass. (2)

TRAMETES CORRUGATA (Pers.) Bres. (2)
    Aleurites moluccana
    Aleurites sp.
    Ficus elastica
    Mangifera indica
TRAMETES LACTINEA Berk. (2)
TRAMETES sp. (2)
TRANZSCHELIA PRUNI-SPINOSAE (Pers.) Diet.
    Prunus persica (64)
TRICHOLOMA sp. (71)

UREDINOPSIS PTERIDIS Diet. & Holw.
    Pteridium aquilinum (64)
UREDO HAWAIIENSIS Arthur
    Carex wahuensis (64)
UREDO STEVENSII Arthur (64)
    Euphorbia clusiaefolia
    Euphorbia sp.
UROMYCES ALYXIAE Arthur
    Alyxia olivaeformis (64)
UROMYCES CARYOPHYLLINUS (Schr.) Wint.
    Dianthus caryophyllus (64)
UROMYCES KOAE Arthur
    Acacia koa (64)
UROMYCES LEPTODERMUS Syd.
    Panicum purpurascens (64)
UROMYCES MEDICAGINIS Pass.
    Medicago sativa (64)
UROMYCES PHASEOLI TYPICA Arthur
    Phaseolus vulgaris (4)

UROMYCES PHASEOLI VIGNAE (Barclay) Arthur (22)
    Vigna sesquipedalis
    Vigna sinensis
UROMYCES PROEMINENS (DC.) Pass.
    Euphorbia serpyllifolia (prostrata?) (64)
UROMYCES RHYNOCOSPORAE El.
    Rhynchospora lavarum (64)
UROMYCES SCIRPI (Cast.) Burr.
    Scirpus sp. (64)
USTILAGO AVENAE (Pers.) Jens.
    Avena sativa (64)
USTILAGO BROMIVORA (Tul.) Fisch. de Waldh.
    Bromus catharticus (50)
USTILAGO HORDEI (Pers.) Kell. & Sw.
    Hordeum vulgare (64)
USTILAGO UTRICULOSA (Nees) Tul.
    Polygonum glabrum (51)
USTILAGO ZEAE (Beckm.) Unger
    Zea mays (50)
USTILAGO sp.
    Cynodon dactylon (70)

Fungi Imperfecti

ALLANTOSPORA RADICICOLA Wakk.
    Saccharum officinarum (15)
ALTERNARIA BRASSICAE (Berk.) Sacc.
    Brassica oleracea (51)
    Brassica oleracea var. botrytis R
    Brassica oleracea var. capitata (49)
    Brassica rapa (50)
ALTERNARIA SOLANI (Ell. & Mart.) Jones & Grout
    Lycopersicon esculentum (51)
    Solanum tuberosum (3)
ALTERNARIA SONCHI Stevens
    Sonchus oleraceus (64)
ALTERNARIA sp.
    Ananas comosus (61)
ASCHERSONIA MARGINATA Ell. & Ev.
    Psidium sp. (64)
ASCOCHYTA sp. (pisi ?)
    Pisum sativum (50)

BOTRYTIS sp.
    Passiflora sp. (64)

CERCOSPORA AGERATI Stevens
    Ageratum conyzoides (64)

CERCOSPORA ALABAMENSIS Atk.
Ipomoea pes-caprae (64)
CERCOSPORA ALTHAEINA Sacc.
Modiola caroliniana (64)
CERCOSPORA APII CAROTAE Pass.
Daucus carota var. sativa (49)
CERCOSPORA ARCTII Stevens
Arctium lappa (64)
CERCOSPORA ASPARAGI Sacc.
Asparagus officinalis var. altis (49)
CERCOSPORA BETICOLA Sacc.
Beta vulgaris (64)
CERCOSPORA BOLLEANA (Thüm.) Speg.
Figus carica (5)
CERCOSPORA COFFEICOLA Berk. & Curt.
Coffea arabica (64)
CERCOSPORA CRUENTA Sacc.
Phaseolus vulgaris (49)
CERCOSPORA DEMETRIONIANA Wint.
Crotalaria spectabilis (51)
CERCOSPORA ECHINOCYSTIS Ell. & Mart.
Momordica charantia (64)
CERCOSPORA MEGALOPOTAMICA Speg.
Bidens pilosa var. radiata (64)
CERCOSPORA MELONGENAE Welles
Solanum melongena (49)
CERCOSPORA NICOTIANAE Ell. & Ev.
Nicotiana tabacum (64)
CERCOSPORA PERSONATA (Berk. & Curt.) Ell.
Arachis hypogaea (49)
CERCOSPORA PIPTURI Stevens & Glick
Pipturus albidus (64)
CERCOSPORA PLANTAGINIS Sacc.
Plantago sp. (64)
CERCOSPORA SAGITTARIAE Ell. & Kell.
Sagittaria sagittifolia (64)
CERCOSPORA TECTONIAE Stevens
Tectona grandis (64)
CERCOSPORA VAGINAE Krüg.
Saccharum officinarum (64)
CERCOSPORA sp. (49)
Manihot esculenta
Raphanus sp.
CLADOSPORIUM HERBARUM (Pers.) Link
Saccharum officinarum (70)
CLADOSPORIUM sp.
Colocasia esculenta (64)
CLYPEOSEPTORIA ROCKII Stevens & Young
Platydesma campanulata (64)

COLLETOTRICHUM ARTOCARPI DeLacr.
    Artocarpus incisa (64)
COLLETOTRICHUM DIANELLAE Stevens & Young
    Dianella sandwicensis (64)
COLLETOTRICHUM DRACAENAE Allesch.
    Agapanthus sp. (64)
COLLETOTRICHUM FALCATUM Went
    Saccharum officinarum (15)
COLLETOTRICHUM GLOEOSPORIOIDES Penz.
    Citrus aurantium (64)
    Citrus limonia (50)
COLLETOTRICHUM LAGENARIUM (Pass.) Ell. & Halst.
    Citrullus vulgaris (70)
    Cucumis melo (49)
COLLETOTRICHUM LINDEMUTHIANUM (Sacc. & Magn.) Briosi & Cav.
    Phaseolus vulgaris (3)
COLLETOTRICHUM MALVARUM (Braun & Casp.) Southworth
    Sida sp. (64)
COLLETOTRICHUM PASSIFLORAE Stevens & Young (64)
    Passiflora edulis
    Passiflora laurifolia
COLLETOTRICHUM PEREGRINUM Pass.
    Nothopanax sp. (64)
COLLETOTRICHUM PHYLLOCACTI Ell. & Ev.
    Phyllocactus sp. (62)
COLLETOTRICHUM sp.
    Lycopersicon esculentum (49)
CONIOTHYRIUM DRACAENAE Stevens & Weedon
    Dracaena aurea (64)
CONIOTHYRIUM ZINGIBERI Stevens & Atienza
    Zingiber officinale (48)
CURVULARIA LUNATA (Wakk.) Boed.
    Saccharum officinarum (15)

DENDROPHOMA GOULDIAE Stevens & Plunkett
    Gouldia terminalis var. typica f. eutypica (64)
DICHOTOMOPHTHORA PORTULACAE Mehr. & Fitz.
    Portulaca grandiflora (69)
    Portulaca lutea (69)
    Portulaca oleracea (47)
DIPLODIA NATALENSIS Evans (65)
    Hibiscus tiliaceus
    Panax sp.
DIPLODIA OPUNTIAE Sacc.
    Opuntia sp. (4)

EXIOCONIDIUM CIBOTII Plunkett
    Cibotium chamissoi (64)

FUSARIUM AFFINE Faut. & Lamb.
    Ananas comosus (69)

FUSARIUM COERULEUM (Lib.) Sacc.
    Solanum tuberosum (6)
FUSARIUM CUBENSE EFS.
    Musa cavendishii (49)
FUSARIUM MARTII App. & Woll. (54)
FUSARIUM MONILIFORME Sheldon
    Saccharum officinarum (30)
FUSARIUM OXYSPORUM Schlect.
    Solanum tuberosum (3)
FUSARIUM RADICICOLA Wollen.
    Hibiscus sabdariffa (4)
    Persea sp. (4)
    Solanum tuberosum (3)
FUSARIUM SOLANI (Mart.) Sacc.
    Ipomoea batatas (3)
FUSARIUM VASINFECTUM Atk.
    Crotalaria sp. (70)
    Musa sp. (3)
FUSARIUM sp. (conglutinans var. callistephi?)
    Callistephus chinensis (51)
FUSARIUM sp. (niveum?)
    Citrullus vulgaris (51)
FUSARIUM sp.
    Ananas comosus (29)
    Asparagus officinalis var. altis (50)
    Capsicum frutescens (50)
    Dianthus caryophyllus (70)
    Lathyrus odoratus (50)
    Lupinus hirsutus (49)
    Pisum sativum (69)
    Saccharum officinarum (29)
    Solanum melongena (49)
    Strelitzea reginae (51)
    Zingiber officinale (51)
FUSICOCCUM CANAVALIAE (no author given)
    Canavalia ensiformis (64)

GLOEOSPORIUM AFFINE E. & R. (64)
GLOEOSPORIUM BARRINGTONIAE Stevens & Young
    Barringtonia asiatica (64)
GLOEOSPORIUM CANAVALIAE Syd.
    Canavalia sp. (39, p. 287)
GLOEOSPORIUM CEREI Passer.
    Cereus sp. (64)
GLOEOSPORIUM LIMETTICOLUM Clausen
    Citrus aurantifolia (52)

OEOSPORIUM MUSARUM Cke. & Mass.
Musa sp. (64)
OEOSPORIUM PEIEAE Stevens
Pelea sp. (64)
OEOSPORIUM sp.
Anacardium occidentale
Capsium frutescens (49)
Coffea sp. (4)
Chrysophyllum cainito (5)
Litchi chinensis (3)
Macadamia ternifolia (50)
Mangifera indica (3)
Manihot esculenta (3)
Musa cavendishii (3)
Persea americana (3)
Psidium guajava (3)
Vailla fragans (3)
RAPHIUM DUBAUTIAE Stevens & Weedon
Dubautia laxa (64)
RAPHIUM sp.
Saccharum officinarum (15)

ARKNESSIA GUNNERAE Stevens & Young
Gunnera petaloidea (64)
ARKNESSIA HAWAIIENSIS Stevens & Young
Eucalyptus robusta (64)
ELMINTHOSPORIUM CIBOTII Stevens & Weedon
Cibotium sp. (64)
ELMINTHOSPORIUM GLEICHENIAE Stevens & Click
Gleichenia linearis (64)
ELMINTHOSPORIUM RAVENELII Curt. & Berk.
Sporobolus elongatus (64)
Sporobolus poiretii (50)
ELMINTHOSPORIUM SACCHARI (v. Breda de Haan) Butler
Saccharum officinarum (29)
ELMINTHOSPORIUM STENOSPILUM Drechs.
Saccharum officinarum (42)
ELMINTHOSPORIUM sp.
Oryza sativa (50)
Panicum purpurascens (49)
ENDERSONIA NITIDA Ell. & Ev.
Suttonia sp. (64)
IMANTIA STELLIFERA Johns.
Saccharum officinarum (18)
ORMIACTELLA SACCHARI Johns. (?)
Saccharum officinarum (66)

HORMODENDRUM CLADOSPORIODES Sacc. (70)

ISARIOPSIS GRISEOLA Sacc.
Phaseolus vulgaris (4)

LEPTOTHYRIUM GLEICHENIAE Stevens & Young (64)
Gleichenia glauca
Gleichenia sp.
LEPTOTHYRIUM POTHI Weedon
Pothos sp. (64)
LEPTOTHYRIUM SIDAE Stevens & Young
Sida rhombifolia (51)
Sida spinosa (64)

MACROPHOMA CATTLEYICOLA P. Henn.
Cattleya sp. (64)
MACROPHOMA SMILACINA (Pk.) Berl. & Vogl.
Smilax sandwicensis (64)
MACROSPORIUM GRAMINUM Cke.
Saccharum officinarum (69)
MACROSPORIUM Sp.
Allium sp. (49)
MELANCONIUM PANDANI Lév.
Pandanus odoratissimus (64)
MELANCONIUM SACCHARI Mass.
Saccharum officinarum (15)
MELANCONIUM sp.
Cocos nucifera (70)
MONILIA AUREOFULVA C. & E. (64)
MONILIA SITOPHILA (Mont.) Sacc. (15)
MONILIA sp.
Ananas comosus (69)
MONILOCHAETES INFUSCANS Halst.
Ipomoea batatas (3)

NIGROSPORA ORYZAE (Berk. & Br.) Petch
Saccharum officinarum (15)

OIDIUM sp. (64)
Cassia occidentalis
Coreopsis sp.
Dahlia sp.
Erigeron sp.
Euphorbia sp.
Rosa sp.
Verbena sp.
Xanthium saccharatum
Zinnia sp.

PESTALOZZIA FUNEREA Desm.
    Cupressus macrocarpa (70)
PESTALOZZIA sp.
    Antidesma platyphyllum (64)
    Cladium angustifolium (64)
    Cladium meyenii (64)
    Cocos nucifera (70)
    Dianthus sp. (64)
    Elaphoglossum sp. (64)
    Eucalyptus globosus (64)
    Eugenia malaccensis (64)
    Musa sp. (64)
    Sagittaria sagittifolia (49)
PHOMA AGAPANTHI (Thüm) Sacc
    Agapanthus umbellatus (64)
PHOMA BARRINGTONIAE Cke. & Mass.
    Barringtonia asiatica (64)
PHOMA DESTRUCTIVA Plow. emend. Jamieson
    Lycopersicon esculentum (50)
PHOMA HENNINGSII Sacc.
    Albizzia lebbek (64)
PHOMA HERBARUM West.
    Stachytarpheta dichotoma (64)
PHOMA LINGAM (Tode) Desm.
    Brassica oleracea var. capitata (49)
PHOMA MACULARIS Desm.
    Hibiscus sabdariffa (64)
PHOMA MUSAE Carp. (4)
    Musa cavendishii
    Prosopis chilensis
PHOMA SUBCIRCINATA Ell. & Ev.
    Phaseolus lunatus (49)
PHOMA TERRESTRIS Hansen
    Allium sp. (50)
PHOMA sp.
    Ananas comosus (61)
PHOMOPSIS ACHILLEAE (Sacc.) v. Höhn. (64)
    Dahlia sp.
    Hemerocallis sp.
PHOMOPSIS VEXANS (Sacc. & Syd.)Harter
    Solanum melongena (64)
PHOMOPSIS sp.
    Cupressus macrocarpa (70)
PHYLLOSTICTA ARICOLA Bubak
    Pothos sp. (64)
PHYLLOSTICTA ARTOCARPI Speg.
    Artocarpus incisa (64)

PHYLLOSTICTA CASIMIROAE Stevens & Weedon
    Casimiroa edulis (64)
PHYLLOSTICTA CIRCUMSCISSA Cooke
    Prunus persica (64)
PHYLLOSTICTA CODIAEI Stevens & Young
    Codiaeum moluccanum (64)
PHYLLOSTICTA COLOCASIOPHILA Weedon
    Colocasia esculenta (64)
PHYLLOSTICTA CORDYLINOPHILA Young
    Cordyline terminalis (64)
PHYLLOSTICTA DRACONIS Berk.
    Dracaena draco (64)
PHYLLOSTICTA ERECHTITIS Stevens & Young
    Erechtites sp. (64)
PHYLLOSTICTA HAWAIIENSIS Caum (P. sorghina Sacc.) (44)
    Saccharum officinarum (14, p. 278)
PHYLLOSTICTA HELICONIAE Stevens & Young
    Heliconia sp. (64)
PHYLLOSTICTA HORTORUM Speg.
    Solanum melongena (4)
PHYLLOSTICTA MARANTACEAE P. Henn.
    Maranta dichtoma (64)
PHYLLOSTICTA MUSAE Stevens & Young
    Musa sp. (64)
PHYLLOSTICTA MUSICOLA Stevens & Young
    Musa sp. (64)
PHYLLOSTICTA NERII West.
    Nerium oleander (64)
PHYLLOSTICTA PITHECOLOBII E. Young
    Samanea saman (64)
PHYLLOSTICTA POTHICOLA Weedon
    Pothos sp. (64)
PHYLLOSTICTA SCAEVOLAE Ell. & Ev.
    Scaevola chamissoniana (64)
PHYLLOSTICTA STRAMINELLA Bres.
    Rheum rhaponticum (50)
PHYLLOSTICTA VIOLAE Desmaz.
    Viola sp. (51)
PHYLLOSTICTA ZINGIBERIS Stevens & Ryan
    Zingiber zerumbet (64)
PHYLLOSTICTA sp.
    Arachis hypogaea (50)
    Phaseolus vulgaris (51)
    Rosa sp. (50)
    Vicia faba (49)
PIRICULARIA GRISEA (Cooke) Sacc.
    Oryza sativa (4)
PIROSTOMA DIANELLAE Stevens
    Dianella sandwicensis (64)

PLEOCYTA SACCHARI (Mass.) Petr. & Syd.
Saccharum officinarum (44)

RAMULARIA IPOMOEAE Stevens
Calonyction aculeatum (64)
RAMULARIA MICROLEPIAE Stevens
Microlepia sp. (64)
RAMULARIA NEPHROLEPIS Stevens
Neprolepis exaltata (64)
RHABDOSPORA PITTOSPORI Stevens & Young
Pittosporum sp. (64)

SEPTOGLOEUM ARACHIDIS Racib.
Arachis hypogaea (4)
SEPTORIA APII (Br. & Cav.) Chester
Apium graveolens var. dulce (3)
SEPTORIA APII-GRAVEOLENTIS Dorogin
Apium graveolens var dulce (49)
SEPTORIA BATATICOLA Taub.
Ipomoea batatas (3)
SEPTORIA CALLISTEPHI Gloyer
Callistephus chinensis (51)
SEPTORIA CANAVALIAE Lyon
Canavalia sp. (67)
SEPTORIA CERASTII Rob. & Desm.
Cerastium sp. (64)
SEPTORIA CLERMONTIAE Stevens & Young (64)
Clermontia kakeana (?)
Clermontia sp.
SEPTORIA DIANTHI Desm.
Dianthus caryophyllus (50)
SEPTORIA GOULDIAE Stevens & Young (64)
Gouldia terminalis var. coriacea
Kadua grandis
SEPTORIA GRAMINUM Desm. (64)
SEPTORIA HAWAIIENSIS Stevens & Plunkett
Gouldia sp. (64)
SEPTORIA LACTUCAE Peck
Lactuca sativa (49)
SEPTORIA LYCOPERSICI Speg.
Lycopersicon esculentum (3)
Solanum melongena (49)
SEPTORIA POA-TRIVIALIS Cocconi
Poa annua (64)
SEPTORIA ROLLANDIAE Stevens & Young
Rollandia crispa (64)

SEPTORIA ROSTRUPII Sacc. & Syd.
Chrysanthemum indicum (64)
SEPTORIA SALVIAE-PRATENSIS Pass,
Salvia coccinea (64)
SEPTORIA sp.
Centella asiatica (51)
SPHACELOMA FAWCETTII Jenk.
Citrus sp. (50)
SPHAEROPSIS GOULDIAE Stevens & Plunkett
Gouldia sp. (64)
Leucaena glauca (?) (65)
Nerium oleander (?) (65
Prosopis sp. (?) (65)
SPHAEROPSIS MALORUM Peck (65)
Gossypium sp.
Prosopis sp.
SPORONEMA sp.
Cupressus macrocarpa (70)
STAGONOSPORA ERYTHRINAE Stevens & Young
Erythrina monosperma (64)
STRUMELLA SACCHARI Cke.
Saccharum officinarum (15)

TRICHODERMA LIGNORUM (Tode) Harz
Ananas comosus (29)
Saccharum officinarum (15)
TRICHODERMA sp.
Ananas comosus (61)

VERTICILLIOPSIS sp. (69)
VERTICILLIUM sp. (heterocladum ?)
Ananas comosus (61)
VERTICILLIUM sp.
Ananas comosus (61)
Hibiscus esculentus (51)
Saccharum officinarum (70)
Solanum tuberosum (70)

Mycelia Sterilia

RHIZOCTONIA SOLANI Kühn
Solanum tuberosum (3)
RHIZOCTONIA sp.
Amaranthus gracilis (69)
Ananas comosus (69)
Brassica campestris (4)

(Rhizoctonia sp. cont.)
- Brassica rapa (4)
- Cajanus cajan (70)
- Portulaca oleracea (47)
- Saccharum officinarum (15)
- Stachytarpheta jamaicensis (69)

SCLEROTIUM ROLFSII Sacc.
- Arachis hypogaea (4)
- Cajanus cajan (70)
- Colocasia esculenta (5)
- Daucus carota var. sativa (49)
- Delphinium sp. (50)
- Emilia sonchifolia (69)
- Hemerocallis fulva (70)
- Saccharum officinarum (15)
- Solanum tuberosum (6)

SCLEROTIUM sp.
- Saccharum officinarum (15)

ZASMIDIUM (Rhacodium) TROPICUM (Mont.) Reich. (64)

Fungi Parasitic on, or Associated with, Other Fungi

DARLUCA FILUM (Biv.) Cast. (64)
- Puccinia versicolor Diet. & Holw.
- Uromyces leptodermus Syd.
- Uromyces rhyncosporae El.

CALLORIOPSIS GELATINOSA (Ell. & Mart.) Syd.
- Perisporiaceae (11)

CICINNOBOLUS CESATII de Bary
- Oidium sp. (64)

PARASCORIAS sp. (byrsonimae ?)
- Antennellina hawaiiensis Mendoza (64)

PLOCHMOPELTIDELLA SP. (smilicina ?)
- Phragmocapnias smilicina Mendoza (64)

SPEGAZZINIA ORNATA Sacc.
- Meliola sp. (64)

Fungi Parasitic on Insects

ASPERGILLUS PARASITICUS Speare
- Trionymus sacchari (63)

BOTRYTIS sp. (grassi ?) (64)
- Adoretus sinicus
- Anomala orientalis

(Botrytis sp. cont.)
    Calandra remota
    Pseudolus hospes
    Scolytidae
    Stenommatus musae

CORDYCEPS sp. (63)
    Perkinsiella saccharicida
    Siphanta acuta

ENTOMOPHTHORA PSEUDOCOCCI Speare (63)
    Trionymus sacchari
    Pseudococcus virgatus
ENTOMOPHTHORA sp.
    Perkinsiella saccharicida (63)
FUSARIUM MONILIFORME Sheldon
    Syagrius fulvitarsis (70)

ISARIA SAUSSUREI Cooke
    Polistes sp. (63)

LABOULBENIA CAULICULATA Thaxter (68)
    Atelothrus constrictus
    Atelothrus depressus
    Colpocaccus lanaiensis
    Colpocaccus marginatus
    Mesothriscus alternans
    Mesothriscus hawaiiensis
    Mesothriscus muscicola
    Metromenus fraudator
LABOULBENIA CAULICULATA var. PROLIXA Thaxter (68)
    Mesothriscus collaris
    Mesothriscus tricolor
    Metromenus aequalis
LABOULBENIA CAULICULATA var. SPECTABILI Thaxter (68)
    Metromenus caliginosus
    Metromenus latifrons
    Metromenus mutabilis
LABOULBENIA DISENOCHI Thaxter (68)
    Anchonymus agonoides
    Brosconymus optatus
    Disenochus ?aterimus
    Disenochus fractus
    Disenochus sulcipennis
LABOULBENIA HAWAIIENSIS Thaxter (68)
    Atelothrus erro
    Atelothrus gracilis

(Laboulbenia hawaiiensis Thaxter cont.)
- Bembidium sp.
- Colpocaccus hawaiiensis
- Colpocaccus lanaiensis
- Colpocaccus posticatus
- Colpocaccus tantalus
- Colpodiscus lucipetens
- Mauna frigida
- Mecyclothorax montivagus
- Mecyclothorax ovipennis
- Mecyclothorax pusillus
- Mesothriscus alternans
- Mesothriscus muscicola
- Mesothriscus tricolor

LABOULBENIA SPEYRI Thaxter (68)
- Metromenus caliginosus
- Metromenus epicurus
- Metromenus latifrons

METARRHIZIUM ANISOPLIAE (Metsch.) Sorok. (63)
- Adoretus sinicus
- Anomala orientalis
- Gonocephalum seriatum
- Conoderus exsul
- Asynonychus godmani
- Plusia chalcites
- Rhabdocnemis obscura

NECTRIA SUBCOCCINEA Sacc. & Ell.
- Coccidae (64)

OPHIONECTRIA COCCICOLA (Ell. & Ev.) Berl. & Vogl.
- Lepidosaphes beckii (63)

SPHAEROSTILBE COCCOPHILA Tul.
- Lepidosaphes beckii (5)

SPOROTRICHUM sp. (64)
- Genophantis sp.
- Perkinsiella saccharicida
- Somnoprepia sp.

TORRUBIELLA sp.
- Omiodes accepta (63)

Fungi Parasitic on Nematodes

ARTHROBOTRYS OLIGOSPORA Fresenius
Various nematodes (33)

CATENARIA ANGUILLULAE Sorokin
Various nematodes (33)

HARPOSPORIUM ANGUILLULAE Lohde
Various nematodes (33)

MICROCERA sp.
Heterodera marioni (Cornu) Goodey (48) (H. radicicola (Greeff) Müller)

PENICILLIUM sp.
Heterodera marioni (Cornu) Goodey (69) (H. radicicola (Greeff) Müller)

STYLOPAGE HADRA Drechs.
Various nematodes (33)

BACTERIA

ACTINOMYCES SCABIES (Thax.) Güssow
Solanum tuberosum (3)

BACTERIUM sp.
Allium sp. (50)
Brassica oleracea (49)
Lactuca sativa (49)

ERWINIA ATROSEPTICA (van Hall) Bergey et al.
Solanum tuberosum (69)
ERWINIA CAROTOVORA (Jones) Holland
Allium sp. (50)
Colocasia esculenta (49)

MICROSPIRA NORTHII Carp. & Bom.
Saccharum officinarum (juice) (9)

PHYTOMONAS ALBILINEANS (Ashby) Magrou
Saccharum officinarum (45)
PHYTOMONAS CAMPESTRIS (Pamm.) Bergey et al.
Brassica oleracea var. capitata (49)

PHYTOMONAS CITRI (Hasse) Bergey et al.
    Citrus sp. (20)
PHYTOMONAS MARGINATA (McCulloch) Bergey et al.
    Gladiolus sp. (50)
PHYTOMONAS PHASEOLI (EFS.) Bergey et al.
    Phaseolus vulgaris (49)
PHYTOMONAS RUBRILINEANS Lee, Purdy, Barnum, & Martin
    Saccharum officinarum (15)
PHYTOMONAS SOLANACEARUM (EFS.) Bergey et al.
    Musa sapientum (70)
    Nicotiana tabacum (4)
    Petunia sp. (70)
    Solanum tuberosum (70)
    Tropaeolum sp. (70)
PHYTOMONAS VESICATORIA (Doidge) Bergey et al.
    Capsium frutescens (49)

NEMATODES

Synonyms in nomenclature in this section are those found in Hawaiian literature.

Plant Parasitic Nematodes

APHELENCHOIDES PARIETINUS (Bastian) Steiner
    Various fungi (35)
APHELENCHUS AVENAE Bastian
    Various fungi (35)

DITYLENCHUS DIPSACI (Kühn) Filipjev (21) (Anguillulina dipsaci (Kühn) Gerv. & v.Bens., Tylenchus dipsaci (Kühn) Bastian).
    Hypochaeris radicata (25)

HETERODERA MARIONI (Cornu) Goodey (H. radicicola (Greeff) Müller)
    Acanthospermum australe (69)
    Ageratum conyzoides (69)
    Allium cepa R
    Amaranthus gracilis (69)
    Amaranthus hybridus (69)
    Amaranthus spinosus (69)
    Ananas comosus (29)
    Antirrhinum majus R
    Arachis hypogaea (49)
    Avena fatua (69)

(Heterodera marioni cont.)

Avena sativa (69)
Bacopa sp. (69)
Begonia sp. (51)
Beta vulgaris (51)
Beta vulgaris var. cicla R
Bidens pilosa (69)
Bidens sp. (69)
Brassica campestris (69)
Brassica oleracea (50)
Brassica oleracea var. botrytis R
Brassica oleracea var. capitata R
Brassica pekinensis R
Brassica rapa (69)
Brighamia sp. (69)
Bromus secalinus (69)

Cajanus cajan (69)
Canavalia ensiformis (69)
Canavalia gladiata (69)
Canna edulis (24)
Capsicum frutescens (51)
Carica papaya (51)
Cassia leschenaultiana (69)
Cassia occidentalis (69)
Cassia tora (69)
Cenchrus echinatus (69)
Centella asiatica (69)
Chenopodium album (69)
Chloris gayana (69)
Citrullus vulgaris R
Citrus aurantium R
Citrus limonia R
Citrus sinensis R
Coffea arabica R
Coleus sp. (51)
Commelina nudiflora (69)
Convolvulus arvensis (69)
Crotalaria saltiana (69)
Crotalaria usaramoensis (69)
Crotalaria sp. (69)
Cucumis melo R
Cucumis sativus (51)
Cucurbita pepo R
Cynodon dactylon (69)
Cyperus rotundus (69)

(Heterodera marioni cont.)

Daucus carota (4)
Daucus carota var. sativa (51)
Delphinium sp. R
Desmodium tortuosum (69)
Dianthus caryophyllus (71)
Digitaria sanguinalis (69)
Digitaria violascens (69)

Eleusine indica (69)
Emilia coccinea (69)
Emilia sonchifolia (69)
Erechtites hieracifolia (69)
Erechtites valerianifolia (69)
Erigeron canadensis (69)

Galinsoga parviflora (69)
Glycine soja (69)
Gomphocarpus physocarpus (69)

Helianthus annuus R
Hibiscus esculentus R
Hibiscus sabdariffa R
Hibiscus sp. (5)
Hordeum vulgare (69)

Indigofera suffruticosa (69)
Ipomoea batatas R
Ipomoea insularis (69)

Kadua sp. (69)

Lactuca sativa (69)
Lilium longiflorum R
Lupinus hirsutus (49)
Lycopersicon esculentum (49)

Manihot esculenta R
Manihot glaziovii (62)
Medicago denticulata (69)
Medicago sativa (70)
Mimosa pudica (69)
Momordica balsamina (69)
Musa cavendishii (4)

(Heterodera marioni cont.)

Nicandra physalodes (69)
Nicotiana tabacum (18)

Oxalis corniculata (69)
Oxalis martiana (69)

Passiflora sp. (69)
Phaseolus lathyroides (69)
Phaseolus limensis (69)
Phaseolus vulgaris R
Pisum sativum (69)
Portulaca oleracea (69)

Raphanus sativus (69)
Raphanus sativus var. longipinnatus (69)
Richardia scabra (69)

Saccharum officinarum (18)
Setaria verticillata (69)
Solanum melongena R
Solanum nodiflorum (nigrum) (29)
Solanum tuberosum (6)
Sonchus oleraceus (69)
Sorghum vulgare (69)
Spinacia oleracea R
Stizolobium deeringianum (69)

Taraxacum vulgare (69)
Tephrosia vogelii (51)
Tricholaena repens (69)
Triticum vulgare (69)

Verbena bonariensis (69)
Vernonia cineria (69)
Vicia faba R
Vigna sinensis (18)

Zea mays R
Zinnia pauciflora (69)

PRATYLENCHUS PRATENSIS (de Man) Filipjev (21) (Anguillulina pratensis (de Man) Goffart, Tylenchus brachyurus Godfrey)

Ageratum conyzoides (69)
Amaranthus gracilis (69)
Ananas comosus (23)
Cassia leschenaultiana (69)
Cassia occidentalis (69)
Commelina nudiflora (69)
Cynodon dactylon (69)

(Pratylenchus pratensis cont.)

Digitaria sanguinalis (69)
Elusine indica (69)
Emilia coccinea (69
Emilia sonchifolia (23)
Glycine soja (23)
Indigofera suffruticosa (69)
Lantana camara (69)
Lycopersicon esculentum (23)
Oxalis martiana (69)
Paspalum orbiculare (69)
Saccharum officinarum (23)
Setaria verticillata (69)
Sonchus oleraceus (69)

ROTYLENCHUS MULTICINCTUS (Cobb) Filipjev (21) (Anguillulina multicincta (Cobb) Goodey, Tylenchus spiralis Cassidy, T. oleae Cobb)
Ananas comosus (69)
Avena sativa (69)

ROTYLENCHUS SIMILIS (Cobb) Filipjev (21) (Anguillulina similis (Cobb) Goodey, Tylenchus biformis Cobb, T. similis Cobb)
Ananas comosus (12)
Cajanus cajan (12)
Canna edulis (24)
Cyperus rotundus (48)
Ipomoea batatas (24)
Saccharum officinarum (18)

Predaceous Nematodes

ACTINOLAIMUS sp.
Various other nematodes (34)

APHELENCHOIDES LINFORDI Christie
Various other nematodes (16)

APHELENCHOIDES OAHUENSIS Christie
Various other nematodes (16)

APHELENCHOIDES OLIVEIRAE Christie
Various other nematodes (16)

APHELENCHOIDES TENUICAUDATUS (de Man) Goodey (34)
Heterodera marioni (Cornu) Goodey (H. radicicola (Greeff) Müller)
Pratylenchus pratensis (de Man) Filipjev (Anguillulina pratensis (de Man) Goffart, Tylenchus brachyurus Godfrey)
Various other nematodes

APHELENCHOIDES WINCHESI (Goodey) Filipjev var. FILICAUDATUS Christie
Various other nematodes (16)

DORYLAIMUS spp.
Various other nematodes (35)

MONONCHUS BRACHYLAIMUS Cobb (12)
Heterodera marioni (Cornu) Goodey (H. radicicola (Greeff) Müller
Rotylenchus similis (Cobb) Filipjev (Anguillulina similis (Cobb) Goodey, Tylenchus biformis Cobb, T. similis Cobb)
MONONCHUS BRACHYURUS Bütsch.
Various other nematodes (12)
MONONCHUS COBBI Cassidy
Various other nematodes (12)
MONONCHUS HAWAIIENSIS Cassidy
Various other nematodes (12)
MONONCHUS INDEX Cobb
Various other nematodes (12)
MONONCHUS LACUSTRIS Cobb
Various other nematodes (12)
MONONCHUS LONGICAUDATUS Cobb
Various other nematodes (12)
MONONCHUS MUSCORUM (Dujardin) Bastian
Various other nematodes (12)
MONONCHUS PAPILLATUS Bastian
Heterodera marioni (Cornu) Goodey (26) (H. radicicola (Greeff) Müller)
Various other nematodes (12)
MONONCHUS PARVUS de Man
Various other nematodes (12)
MONONCHUS SIGMATURUS Cobb (12)
Heterodera marioni (Cornu) Goodey (H. radicicola (Greeff) Müller)
Rotylenchus similis (Cobb) Filipjev (Anguillulina similis (Cobb) Goodey, Tylenchus biformis Cobb, T. similis Cobb)
MONONCHUS sp.
Rotylenchus similis (Cobb) Filipjev (13) (Anguillulina similis (Cobb) Goodey, Tylenchus biformis Cobb, T. similis Cobb)

VIRUSES

BLIGHT
Spinacia oleracea (49)

CHLOROTIC STREAK
Saccharum officinarum (43)

MOSAIC

Ananas comosus (10) (mosaic of Commelina nudiflora)
Bambusa vulgaris (27)
Brassica pekinensis (28)
Canna indica (27)
Citrullus vulgaris (70)
Commelina nudiflora (27)
Crotalaria spectabilis (51)
Cucumis melo (49)
Cucumis sativus (49)
Cucurbita pepo (49)
Dianella sandwicensis (27)
Emilia sp. (69)
Hippeastrum sp. (27)
Lactuca sativa (51)
Lilium longiflorum (49)
Lycopersicon esculentum (49)
Musa cavendishii (27)
Nicotiana tabacum (4)
Raphanus sp. (50)
Saccharum officinarum (36)
Solanum tuberosum (49)
Vicia faba (49)
Zea mays (27)

YELLOW SPOT OF PINEAPPLE (Spotted Wilt of Tomato ?)

Ageratum conyzoides (53)
Allium sp. (53)
Ananas comosus (32)
Bidens pilosa (53)
Callistephus chinensis (53)
Capsicum frutescens (53)
Cordyline terminalis (53)
Drymaria cordata (53)
Emilia coccinea (53)
Emilia sonchifolia (32)
Emilia sp. (53)
Erechtites valerianifolia (69)
Erigeron canadensis (69)
Galinsoga parviflora (53)
Lycopersicon esculentum
Nicotiana glauca (53)
Nicotiana tabacum (53)
Pisum sativum (31)
Raphanus sp. (69)
Richardia scabra (53)

(Yellow spot of pineapple cont.)
Solanum melongena (53)
Solanum nodiflorum (nigrum) (53)
Stachys arvensis (53)
Taraxacum vulgare (53)

SYNONYMS AND CORRECTIONS IN NOMENCLATURE OF HOSTS

Present Usage	Previous Usage
Alphitonia ponderosa	Alphitonia excelsa
Bidens pilosa var. radiata	Bidens leucantha
Cajanus cajan	Cajanus indicus
Calonyction aculeatum	Ipomoea bona-nox
Carex wahuensis	Carex oahuensis
Cassia leschenaultiana	Cassia mimosoides
Cenchrus echinatus var. hillebrandianus	Cenchrus hillibrandianus
Ceodes umbellifera	Pisonia umbellifera
Cladium angustifolium	Vincentia angustifolia
Cladium meyenii	Baumea meyenii
Cynodon dactylon	Capriola dactylon
Desmodium tortuosum	Meibomia tortuosa
Dianella sandwicensis	Dianella odorata
Digitaria pruriens	Syntherisma pruriens
Diospyros hillebrandii	Maba hillebrandii
D. sandwicensis	M. sandwicensis
Dubautia sp.	Railliardia sp.
Elaphoglossum sp.	Acrostichum sp.
Emilia sonchifolia	Emilia sagittata
Freycinetia arborea	Freycinetia arnotti

Present Usage	Previous Usage
Gleichenia emarginata	Dicranopteris emeraginata
G. glauca	Gleichenia longissima
G. linearis	G. dichotoma
Glycine soja	Glycine max
Gouldia terminalis var coriacea	Gouldia lanceolata
G. terminalis var. elongata	Gouldia elongata
G. terminalis var. macrocarpa	G. macrocarpa
G. terminalis var. typica f. eutypica	G. coriacea
Holcus sp.	Notholcus
Ilex anomala	Byronia sandwicensis
Ipomoea indica	Ipomoea insularis
Korthalsella sp.	Viscum articulatum
Labordia sp.	Labordea sp.
Lantana camara	Lantana aculeata
Lochnera sp.	Vinca sp.
Manihot esculenta	Manihot utilissima
Metrosideros collina subsp. polymorpha	Metrosideros collina polymorpha var. incana
	M. polymorpha
Modiola caroliniana	Modiola carolina
Mucuna gigantea	Macuna gigantea
Nicandra physalodes	Nicandra physaloides
Panicum purpurascens	Panicum barbinode
Peperomia sp.	Piperomia sp.
Persea americana	Persea gratissima
Prosopis chilensis	Prosopis juliflora
Rhynchospora sclerioides	Rhynchospora thrysoidea
Richardia scabra	Richardsonia scabra
Rockia sandwicensis	Pisonia sandwicensis
Rollandia humboldtiana	Rollandia racemosa

Present Usage	Previous Usage
Samanea saman	Pithecolobium saman
Sorghum halepense	Holcus halepensis
Sporobolus elongatus	Sporobolis elongatus
Suttonia sp.	Myrsine sp.
Taraxacum vulgare	Taraxacum officinale
Tricholaena repens	Tricholaena rosea
Xanthium saccharatum	Xanthium italicum

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71. List of importations of fungal cultures, in Files of the Territorial Plant Inspection Bureau, Honolulu, T.H. Made available by the Head Inspector.

THE PLANT DISEASE REPORTER

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Division of Mycology and Disease Survey

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Supplement 122

A BRIEF HOST INDEX OF SOME PLANT PATHOGENS AND VIRUS DISEASES IN EASTERN ASIA

May 1, 1940

A BRIEF HOST INDEX OF SOME PLANT PATHOGENS AND VIRUS DISEASES IN EASTERN ASIA

By G. D. Darker
Farlow Herbarium, Harvard University

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The following index has been compiled on the basis of records which may be traced in Merrill and Walker's "A Bibliography of Eastern Asiatic Botany," Arnold Arboretum of Harvard University, Jamaica Plain, Massachusetts, 1938. It is hoped that it will serve as a supplement to the more comprehensive host indexes already published for the region. The latter have been enumerated in this list under the heading "Plants," with the secondary notation "(Host index)."

HOST INDEX

ALGAE

AEGAGROPILA sauteri (Nees) Kützing
Pythium akanense Tokunaga: Tokunaga, Y., 1932.

MARINE ALGAE
Nadsoniomyces sphenoideus Kudriâvtsev: Kudriâvtsev, V.I., 1932.

FUNGI

ELAPHOMYCES
Cordyceps: Imai, Sanshi, 1929.

ELAPHOMYCES subvariegatus Imai
Cordyceps intermedia Imai: Imai, Sanshi, 1934a.

OIDIUM astericola Hino & Katô
Cicinnobolus asteris Hino & Katô: Hino, Iwao, and Katô, Huzio, 1929.

OIDIUM euonymi-japonici (Arcang.) Sacc.
Cicinnobolus euonymi-japonici Arcang.: Hino, Iwao, and Katô, Huzio, 1929.

LICHENES

LICHENES
Chlorocyphella aeruginascens (Karst.) Keissler: Keissler, K. von, 1933.
Leciographa inspersa Rehm: Keissler, K. von, 1933.
Parasites: Keissler, K. von, 1927.
Phoma lichenis Pass.: Keissler, K. von, 1933.
Tichothecium pygmaeum Körb. var. ecatonsporum (Anzi) Wint.: Keissler, K. von, 1933.

MUSCI

POLYTRICHUM gracile Dicks.
Stagonospora komarovii Ohl: Ohl, I. A., 1922.

FILICALES

FILICALES
Diseases: Bubák, G., 1916.
Hyalopsora polypodii (Diet.) P. Magn.: Hiratsuka, Naohide, and Uemura, Yokuta, 1932b.
Milesina: Kamei, S., 1932b.
Uredinopsis: Kamei, S., 1932b.
Uredinopsis adianti Kom.: Magnus, P., 1901b.

POLYPODIUM vulgare L.
Milesina jezoensis Kamei & Hirats. f.: Kamei, S., 1931.

POLYSTICHUM
Milesina exigua Faull: Hiratsuka, Naohide, and Yoshida, Yasuo, 1932.
Milesina vogesiaca P. & H. Syd.: Hiratsuka, Naohide, and Yoshida, Yasuo, 1932.
Witches'-broom: Kodama, S., 1911b.

POLYSTICHUM aristatum Swartz
Taphrina cornu-cervi Giesenh.: Kodama, S., 1911b.

POLYSTICHUM braunii Lawson
Milesina vogesiaca P. & H. Syd.: Kamei, S., 1930b.

CONIFERAE

ABIES
Arceuthobium chinense Lecomte: Turrill, W. B., 1920c.

ABIES firma Sieb. & Zucc.
Milesina vogesiaca P. & H. Syd.: Kamei, S., 1930b.

ABIES mayriana Miyabe & Kudô
Milesina vogesiaca P. & H. Syd.: Kamei, S., 1930b.

ABIES sachalinensis Mast.
Milesina vogesiaca P. & H. Syd.: Kamei, S., 1930b.

ABIES sibirica Ledeb.
Calyptospora goeppertiana Kühn: Kravtzov, B. I., 1933.
Diseases: Kravtzov, B. I., 1933.
Fomes robustus Karst.: Kravtzov, B. I., 1933.
Trametes carnea Nees: Kravtzov, B. I., 1933.

CHAMAECYPARIS formosensis Matsum.
Stereum sulcatum Burt: Yamamoto, Wataro, and Itô, Takeo, 1932-33.

CHAMAECYPARIS obtusa Sieb. & Zucc. f. formosana Hayata
Hymenochaete: Yamamoto, Watarô, and Itô, Takeo, 1936.

CONIFERAE
Hypodermataceae: Darker, G. D., 1932.
Phomopsis cryptomeriae Kitashima & Kamei: Hahn, G. G., 1930.
Witches'-brooms: Kusano, S., 1904f.
Wood-destroying Fungi: Hemmi, T., 1932c.

CRYPTOMERIA japonica D. Don
Cercospora: Kawamura, Seiichi, 1915a.
Cercospora cryptomeriae Shirai: Kitashima, Kimizô, 1916.
Disease: Miyake, Ichirô, 1935.
Fomes ulmarius Fr.: Hemmi, T., Hirayama, S., and Nojima, T., 1929.
Phyllosticta: Kawamura, Seiichi, 1915a.
Valsa cryptomeriae Kitashima: Kitashima, Kimizo, 1933b.

GINKGO
Diseases: Wang, Schauder, 1933.

JUNIPERUS
Gymnosporangium: Soh You-kuh, [Date?], Chinese append.

JUNIPERUS chinensis L.
Gymnosporangium chinense Long: Long, W. H., 1914.
Gymnosporangium haraeanum Syd.: Long, W. H., 1914.
Gymnosporangium japonicum Syd.: Long, W. H., 1914.
Gymnosporangium yamadae Miyabe: Tai, Fang-lan, 1930b.

JUNIPERUS rigida Sieb. & Zucc.
Gymnosporangium asiaticum Miyabe: Ideta, A., 1904a.

LARIX
Melampsora: Hiratsuka, Naohide, 1927c.
Polyporus officinalis Fr.: Murashkinski, K. E., 1927.

PINUS
Ceratostomella ips Rumb.: Nishikado, Y., and Yamauti, K., 1933-35.
Ceratostomella piceae Münch: Nishikado, Y., and Yamauti, K., 1933-35, 1935.
Ceratostomella pini Münch: Nishikado, Y., and Yamauti, K., 1933-35.
Collybia conigena (P.) Bres.: Kawamura, Seiichi, 1928c.
Disease: Shirai, M., 1899b.
Hypoderma brachysporum v. Tub.: Itô, Takeo, 1936.
Lophodermium pinastri (Schrad. ex Fr.) Chev.: Itô, Takeo, 1936.
Polyporus orientalis Lloyd: Hemmi, T., and Nojima, T., 1928.
Trametes pini (Thore) Fr.: Liubarskii, L. V., 1936b.

PINUS pumila Regel
Hypodermella hiratsukae Darker: Darker, G. D., 1935.

PODOCARPUS thunbergii Sieb.
Corynelia: Winter, G., 1884.

THUJOPSIS dolobrata Sieb. & Zucc.
Witches'-broom: Tubeuf, K. von, 1895.
Fomes robustus Karst.: Kitashima, Kimizo, 1931.

TSUGA sieboldii Carr.
Enteridium yabeanum Emoto: Emoto, Y., 1932a.

PHANEROGAMAE

ACACIA confusa Merr.
Uromyces hyalosporus Sawada: Hirane, Seiichi, 1934.
Sawada, Kaneyoshi, 1913a.

ACER
Taphrina nikkoensis Kusano: Kusano, S., 1907a.

ACER trifidum Hook. & Arn.
Uncinula nankinensis Tai: Tai, Fang-lan, 1930a.

AGAPANTHUS
Phytophthora parasitica Dastur: Takimoto, S., 1934f.

AGROPYRON
Rust: Asuyama, H., 1935.

ALLIUM (Onion)
Fusarium cepae Hanzawa: Hanzawa, Jun, 1914.
Puccinia allii Rud.: Sawada, Kaneyoshi, 1928b.
Puccinia porri (Sowerb.) Wint.: Sawada, Kaneyoshi, 1929.

ALLIUM (Welsh Onion)
Peronospora schleideniana de By.: Hori, Shôtarô, 1893.

ALLIUM bakeri Regel
Helotium: Asuyama, H., Nagai, Yukio, and Nishikiôri, T., 1935.

ALLIUM fistulosum L.
Macrosporium porri Ell: Yoshii, Hazime, 1929b.
Puccinia allii Rud.: Gotô, Kazuo, 1933-35.
Puccinia porri (Sowerb.) Wint.: Gotô, Kazuo, 1933-35.

ALNUS
Melampsoridium: Hiratsuka, Naohide, 1926c.
Taphrina: Kusano, S., 1904b.

AMORPHOPHALLUS rivieri Dur. var. konjac (C. Koch) Ess.
Bacillus aroideae Townsend: Takimoto, S., 1927a.
Fusarium solani (Mart.) App. & Wr.: Kasai, M., 1924a.
Soft rot: Hirata, E., 1927.

ANCHUSA
Rust: Transhel, V., 1934.

ANTIRRHINUM majus L.
Bacteria: Takimoto, S., 1920.
Pythium spinosum Sawada: Sawada, Kaneyoshi, and Chên, Ch'i-ch'ang, 1926.

APPLE [see Malus (Apple)]

ARACHIS hypogaea L. (Peanut)
Botrytis: Suematu, Naogi, 1924.
Sclerotinia: Hanzawa, Jun, 1911a.
Sclerotinia arachidis Hanzawa: Chu, Vong-mey, 1933b.
Sclerotinia miyabeana Hanzawa: Chu, Vong-mey, 1933b.

ARCTIUM lappa L.
Bacillus nigromaculans Takimoto: Takimoto, S., 1927g.

ARUNDINARIA simoni Riv.
Coccoidella arundinariae Hara: Hara, Kanesuke, 1911b.

ASTER scaber Thunb.
Coleosporium pini-asteris Orishimo: Orishimo, Y., 1910.

ASTER tataricus L.f. (Tatar Aster)
Oidium astericola Hino & Katô: Hino, Iwao, and Katô, Huzio, 1929.

ASTILBE chinensis Franch. & Sav.
Pucciniostele clarkiana Transhel & Kom.: Komarov, V. L., 1899.

ASTRAGALUS
Bacterium astragali Takimoto: Takimoto, S., 1930c.

ASTRAGALUS (Milk Vetch)
Sclerotinia trifoliorum Erikss.: Hino, Iwao, 1930.

ASTRAGALUS sinicus L.
Sclerotinia trifoliorum Erikss.: Hori, Shôtarô, 1901d.
Thyrospora astragali Yoshii: Yoshii, Hazime, 1929c.
Tuberculina nomuriana Sacc.: Nomura, H., 1904.

AUCUBA japonica Thunb.
Disease: Tanaka, Nobujirô, 1888a.

AZALEA
Cercospora handelii Bubák: Hemmi, T., and Kurata, S., 1931a.
Rhytisma shiraiana Hemmi & Kurata: Hemmi, T., and Kurata, S., 1931a.
Septoria azaleae Voglino: Hemmi, T., and Kurata, S., 1931b.
Venturia rhododendri Tengwall: Hemmi, T., and Kurata, S., 1931a.

BAMBOO [see BAMBUSEAE (Bamboo)]

BAMBUSA shimadai Hayata
Disease: Kawamura, Seiichi, 1928a.

BAMBUSEAE (Bamboo)
Aciculosporium take Miyake: Miyake, Ichirô, 1908b.
Ceratosphaeria: Kawamura, Seiichi, 1936b.
Chaetosphaeria: Kawamura, Seiichi, 1936b.
Fungi: Hara, Kanesuke, 1913a.
Kawamura, Seiichi, 1907, 1927a.
Miyake, Ichirô, and Hara, Kanesuke, 1910.
Loculistroma bambusae Patterson & Charles: Patterson, F. W., and Charles, V. K., 1910.
Miyoshiella: Kawamura, Seiichi, 1936b.
Puccinia: Hara, Kanesuke, 1933a.
Puccinia phyllostachydis Kusano: Kusano, S., 1908c.
Puccinia sasae Kusano: Kusano, S., 1908c.

BARLEY [see HORDEUM (Barley)]

BEAN [see PHASEOLUS (Bean)]

BEGONIA
Bacterium begoniae Takimoto: Takimoto, S., 1934b.

BERBERIS
Rust: Transhel, V., 1934.

BETA vulgaris L. (Sugar Beet)
Bacillus betivorus Takimoto: Takimoto, S., 1931b.
Bacterium aptatum Brown & Jamieson: Hirata, E., 1928.
Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.

BETA vulgaris L. (Sugar Beet)--Continued
Bacterium tumefaciens Smith & Townsend: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Cercospora beticola Sacc.: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Colletotrichum omnivorum Halsted: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Corticium vagum B. & C.: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Diseases: Nakata, K., and Takimoto, S., 1922b.
Hypochnus centrifugus (Lév.) Bres.: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Phoma betae Frank: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Physarum cinereum (Batsch) P.: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.
Pseudomonas destructans Potter: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1922.

BOEHMERIA nivea Gaud. (Ramie)
Ascochyta boehmeriae Watanabe: Watanabe, Tatsuwo, 1935.
Ramularia boehmeriae Fujiwara: Fujiwara, S., 1916.

BRASSICA campestris L.
Gloeosporium: Yoshino, Kiichi, 1910.

BRASSICA oleracea L. (Cabbage)
Bacillus aroideae Townsend: Takimoto, S., 1927a.
Bacterium campestre (Pammel) E. F. Smith: Takimoto, S., 1928b.

BRASSICA pekinensis Rupr. (Chinese Cabbage, Pe-tsai)
Bacillus aroideae Townsend: Takimoto, S., 1927e.
Bacterium campestre (Pammel) E. F. Smith: Takimoto, S., 1928b.
Bacterium maculicola McCulloch: Takimoto, S., 1931a.

BUCKWHEAT [see FAGOPYRUM (Buckwheat)]

CABBAGE [see BRASSICA oleracea L. (Cabbage)]

CALADIUM
Gloeosporium: Hemmi, T., 1918c.

CALENDULA officinalis L. (Marigold)
Bacterium calendulae Takimoto: Takimoto, S., 1935-36.

CALENDULA officinalis L. var. subspathulata
Alternaria: Yamamoto, Sigeo, 1934.

CALLISTEPHUS chinensis Nees (China Aster)
Disease: Nakamura, Hisao, 1926.
Septoria callistephi Gloyer: Nakamura, Hisao, 1931.

CAMELLIA japonica L.
    Disease: Tanaka, Nobujirô, 1888a.

CAMPHOR [see CINNAMOMUM camphora Nees & Eberm. (Camphor)]

CAPSICUM (Pepper)
    Brachysporium: Hiroe, Isamu, and Watanabe, N., 1934.

CAPSICUM annuum L.
    Bacillus carotovorus Jones: Yoshii, Hazime, 1926, 1927.
    Bacteria: Takimoto, S., 1921b.
    Bacterium vesicatorium Doidge: Yoshii, Hazime, 1928b.

CARICA papaya L.
    Gloeosporium papayae P. Henn.: Lin, Liang-tung, 1929.

CARROT [see DAUCUS carota L. (Carrot)]

CARTHAMUS tinctorius L.
    Gloeosporium carthami (Fukui) Hori & Hemmi: Hemmi, T., 1919a.

CASTANEA (Chestnut)
    Bacterium castaneae Kawamura: Kawamura, Eikichi, 1934a.
    Blight: Chevalier, A., 1921.
        Fairchild, D. G., 1913a.
        Galloway, B. T., 1926.
    Endothia parasitica (Murr.) P. J. & H. W. Anderson: Shear, C. L., and Stevens, N. E., 1913, 1916.
    Trametes dickinsii B.: Hemmi, T., 1933.

CASTANOPSIS
    Blight: Chevalier, A., 1921.
        Galloway, B. T., 1926.

CASTOR OIL PLANT [see RICINUS communis L. (Castor Oil Plant)]

CELOSIA cristata L.
    Fusarium celosiae Abe: Abe, Takuji, 1928b.

CHELIDONIUM majus L.
    Caeoma: Matsumoto, Takashi, 1926.

CHERRY [see PRUNUS cerasus L. (Cherry)]
CHERRY, JAPANESE [see PRUNUS (Japanese Cherry)]
CHESTNUT [see CASTANEA (Chestnut)]
CHINA ASTER [see CALLISTEPHUS chinensis Nees (China Aster)]
CHINESE CABBAGE [see BRASSICA pekinensis Rupr. (Chinese Cabbage; Pe-tsai)]

CHRYSANTHEMUM
Puccinia: Kusano, S., 1904g.
Puccinia chrysanthemi Roze: Kusano, S., 1904g, 1908a.
Puccinia horiana P. Henn.: Kusano, S., 1904g, 1908a.
Septoria: Hemmi, T., 1917.
Septoria chrysanthemella Sacc.: Hemmi, T., and Nakamura, Hisao, 1927.
Septoria obesa Syd.: Hemmi, T., and Nakamura, Hisao, 1927.
Uredo autumnalis Diet.: Kusano, S., 1908a.

CHRYSANTHEMUM cinerariifolium Vis.
Diplodia chrysanthemella Ikata: Ikata, Suchiko, 1928.

CHRYSANTHEMUM indicum L.
Puccinia chrysanthemi Roze: Jacky, E., 1900-03.
Roze, E., 1900c.
Uredo chrysanthemi Roze: Roze, E., 1900a.

CINCHONA
Phytophthora cinchonae Sawada: Sawada, Kaneyoshi, 1936.

CINNAMOMUM camphora Nees & Eberm. (Camphor)
Diseases: Kurosawa, Gompei, 1911.
Fomes lamaensis (Murr.) Sacc. & Trott.: Sawada, Kaneyoshi, 1928a.
Glomerella cinnamomi Yoshino: Yoshino, Kiichi, 1907.
Pestalozzia camphori Kurosawa: Kurosawa, Gompei, 1908, 1911.

CINNAMOMUM loureirii Nees
Disease: Tanaka, Nobujirô, 1888a.

CITRUS
Cladosporium citri Massee: Sawada, Kaneyoshi, and Kurosawa, Gompei, 1925b.
Corticium zimmermannii Sacc. & Syd.: Sawada, Kaneyoshi, 1918c.
Diplodia natalensis Evans: Yü, Ta-fu, 1934c.
Diseases: Anonymous, 1892a.
Fawcett, H. S., and Lee, H. A., 1926.
Hara, Kanesuke, 1933c.
Ikata, Suchiko, 1927a.
Jenkins, A. E., and Fawcett, H. S., 1933.
Nishida, Toji, 1907, 1910, 1914, 1927.
Reinking, O. A., 1921.
Sawada, Kaneyoshi, 1927-30.
Takeuchi, Haruyoshi, 1929, 1931a.
Loranthus: Sawada, Kaneyoshi, 1922a.
Ovularia citri Br. & Farn.: Sawada, Kaneyoshi, and Kurosawa, Gompei, 1925a.
Penicillium fructigenum Takeuchi: Takeuchi, Haruyoshi, 1929.
Phoma citricarpa McAlp.: Kanayama, I., 1932.
Pseudomonas citri Hasse: Tanaka, Tyôzaburô, 1918b.
Sooty mold: Hara, Kanesuke, [no date].
Viscum: Sawada, Kaneyoshi, 1922a.

CITRUS (Orange)
Corticium salmonicolor B. & Br.: Hori, Shôtarô, 1921b.
Sphaceloma: Lu, Ta-ching, and Cheo, C. C., 1934.

CLADRASTRIS
Uromyces: Kusano, S., 1905c.

CLAUSENA lansium (Lour.) Skeels
Gloeosporium: Li, L. Y., 1936.

CLOVER, RED [see TRIFOLIUM (Red Clover)]
CLOVER, WHITE [see TRIFOLIUM (White Clover)]

COFFEA (Coffee)
Cercospora coffeae Zimm.: Fujikuro, Y., 1914g.
Diseases: Du Pasquier, R., 1933.

COFFEE [see COFFEA (Coffee)]

COLOCASIA (Taro)
Bacillus aroideae Townsend: Kawamura, Eikichi, 1931b.
Bacterium colocasiae Takimoto: Takimoto, S., 1932.
Kawakamia colocasiae (Racib.) Sawada: Sawada, Kaneysohi, 1911a.
Phytophthora colocasiae Racib.: Tai, Fang-lan, 1923.

COMPOSITAE
Coleosporium: Hiratsuka, Naohide, 1927g.
Puccinia: Kuprevich, V. F., 1935.

CONVALLARIA majalis L.
Urocystis miyabeana Togashi & Ônuma: Togashi, K., and Ônuma, Fusaji, 1930.

CORYDALIS incisa P.
Caeoma: Matsumoto, Takashi, 1926.

CRATAEGUS
Gymnosporangium magnum Crowell: Crowell, I. H., 1936.

CROCUS
Bacillus croci Mizusawa: Mizusawa, Y., 1923.

CROCUS sativus L.
Bacillus croci Mizusawa: Mizusawa, Y., 1921.
Fusarium bulbigenum Cke. & Mass. var. blasticola (Rostr.) Wr: Abe, Takuji, 1933.

CRUCIFERAE
Albugo candida (P.) Kuntze: Hiura, M., 1930.
Alternaria: Yoshii, Hazime, 1933b.
Bacterium maculicola McCulloch: Takimoto, S., 1931c.

DIOSPYROS (Persimmon)
Gloeosporium kaki Itô: Itô, Seiya, 1911b.

DIOSPYROS kaki L. f.
Pestalozzia diospyri Syd.: Nojima, T., 1929.
Pestalozzia theae Sawada: Nojima, T., 1929.

ECHINOCHLOA crus-galli (L.) Beauv. (Panicum crus-galli L.)
Helminthosporium crus-galli Nishikado & Miyake: Nishikado, Y., and Miyake, Chuichi, 1924b, 1924c.

ECHINOCHLOA crus-galli (L.) Beauv. subsp. submutica Honda var. typica Honda
Sclerotium fumigatum Nakata: Endô, Sigeru, and Sakita, S., 1933.

ECONOMIC PLANTS [see PLANTS, ECONOMIC]

EDGEWORTHIA papyrifera Zucc.
Helicobasidium mompa Tanaka: Honda, Kôsuke, 1891.

EGGPLANT [see SOLANUM melongena L. (Eggplant)]

ERAGROSTIS major Host.
Helminthosporium: Nishidako, Y., 1928c.
Ophiobolus kusanoi Nishikado, Y., 1928c.

ERICACEAE
Pucciniastreae: Hiratsuka, Naohide, 1927b.

ERIOBOTRYA japonica Lindl. (Loquat)
Bacterium eriobotryae Takimoto: Takimoto, S., 1931h.
Entomosporium: Takimoto, S., 1934a.

EVONYMUS
Oidium: Foex, E., 1910.

EVONYMUS japonica L. (Japanese Spindle Tree)
Gloeosporium evonymicola Hemmi: Hemmi, T., 1918a.
Oidium euonymi-japonici (Arcang.) Salm.: Hino, Iwao, and Katô, Huzio, 1929.

FAGOPYRUM [Buckwheat]
Phytophthora fagopyri Takimoto: Takimoto, S., 1935b.

FAGUS
Trametes dickinsii B.: Hemmi, T., 1933.

FAGUS crenata Blume
Endoconidiophora bunae Kitashima: Kitashima, K., 1936.

FIBER PLANTS, BAST
Diseases: Gitman, L., and Boichenko, E., 1934.

FLAX [see Linum (Flax)]

FLOWERS
Bacillus amidoae Townsend: Takimoto, S., 1927a.

FOREST TREES [see TREES, FOREST]

FORTUNELLA (Kumquat)
Pythiacystis citrophthora R. E. & E. H. Smith: Takimoto, S., 1931j.

FRAXINUS rhynchophylla Hance
Uropyxis fraxini (Kom.) P. Magn.: Magnus, P., 1899a.

FRITILLARIA kamtschatcensis Ker-Gawl.
Uromyces miurae Syd.: Rees, C. C., 1917.

FRUIT
Diseases: Fujikuro, Y., 1917.
Ho, William T. H., 1935-36.
Yü, Ta-fu, 1934b, 1934c.

FRUIT TREES [see TREES, FRUIT]
GINSENG [see PANAX (Ginseng)]
GLYCINE hispida Maxim. [see GLYCINE max Merr. (Soy Bean)]

GLYCINE max Merr. (Soy Bean)
Bacterium sojae Wolf: Takimoto, S., 1921a.
Bacterium sojae Wolf. var. japonicum Takimoto: Takimoto, S., 1927h.
Cercospora diazu Miura: Abramov, I. N., 1931.
Cercospora kikuchii Matsumoto & Tomoyasu: Matsumoto, Takashi, and Tomoyasu, R., 1925.
Diaporthe: Yoshii, Hazime, and Sasaki, Seisaburô, 1927.
Diseases: Kataeva, O. E., 1932.
Fusarium: Nojima, T., 1926.
Phomopsis: Sasaki, Syun'iti, 1929b.
Phyllosticta sojaecola Massal.: Abramov, I. N., 1931.
Sclerotinia libertiana Fckl.: Abramov, I. N., 1931.
Septoria glycines Hemmi: Hemmi, T., 1915b.

GOMPHRENA globosa L.
Alternaria gomphrenae Togashi: Togashi, K., 1926a.
Yoshii, Hazime, 1933a.

GOSSYPIUM (Cotton)
Alternaria macrospora Zimm.: Takimoto, S., 1934c.
Bacterium malvacearum E. F. Smith: Nakata, K., Nakajima, Tomosuke, and Takimoto, S., 1924.

GOSSYPIUM (Cotton)--Continued
Diseases: Cook, O. F., 1920.
Jaczewski, A. A., 1931.
Takimoto, S., 1924.
Glomerella gossypii Edgerton: Nakata, K., and Takimoto, S., 1917.

GRAMINEAE
Brachysporium: Hiroe, Isamu, 1935-36.
Diseases: Hemmi, T., 1934a.
Tai, Fang-lan, 1927b.
Drechslera: Itô, Seiya, 1930.
Fusarium: Murashkinski, K. E., 1924.
Gibberella moniliformis (Sheld.) Wineland: Nishikado, Y., 1931-33, 1932.
Helminthosporium: Itô, Seiya, 1930.
Nishikado, Y., 1925, 1928a, 1929b.
Lisea fujikuroi Sawada: Nishidado, Y., 1931-33, 1932.
Ophiobolus: Itô, Seiya, 1930.
Puccinia: Hemmi, T., 1934b.
Takahashi, Yoshinao, 1906a.
Puccinia graminis P. var. tritici Erikss. & Henn.: Rusakov, L.F., 1925, 1927.
Puccinia triticina Erikss.: Rusakov, L.F., 1925, 1927.
Pyrenophora: Itô, Seiya, 1930.
Typhula graminum Karst.: Tasugi, H., 1929, 1930.
Typhula itoana Imai: Imai, Sanshi, 1936b.
Uredinales: Itô, Seiya, 1908-09.
Manabe, A., 1906.
Takahashi, Yoshinao, 1905b, 1906a.
Urocystis: Woo, Chang-tsi, 1934.
Ustilagineae: Hori, Shôtarô, 1896a, 1896b.
Ustilago: Hara, Kanesuke, 1934c.
Woo, Chang-tsi, 1934.

GRAPE [see VITIS (Grape)]

HELIANTHUS (Sunflower)
Bacterium helianthi Kawamura: Kawamura, Eikichi, 1934b.

HEVEA (Rubber Tree)
Fomes semitostus (B.) Cke.: Sawada, Kaneyoshi, 1916d.

HIBISCUS
Bacterium hibisci Nakata & Takimoto: Nakata, K., and Takimoto, S., 1923.

HOP [see HUMULUS (Hop)]

HORDEUM (Barley)
Helminthosporium gramineum Rabh.: Yü, Ta-fu, 1936a.
Ophiobolus graminis Sacc.: Hori, Shôtarô, 1901c.

HORDEUM (Barley)--Continued

Pyrenophora teres (Died.) Drechsler: Nishikado, Y., and Miyake, Chuichi, 1928.

Rhizoctonia: Yokogi, K., 1931.

Sclerotial disease: Matsumoto, Takashi, 1928.

Tilletia pancicii Bubák & Ranoj.: Tasugi, H., and Yamada, Wataru, 1925.

Ustilago hordei (P.) Kellerm. & Swingle: Yü, Ta-fu, and Chen, Hung-kwei, 1930.

Ustilago nuda (Jensen) Kellerm. & Swingle: Hori, Shotaro, 1896c.

HUMULUS (Hop)

Peronoplasmopara humuli Miyabe & Takahashi: Miyabe, K., and Takahashi, Yoshinao, 1906.

HYACINTH (see *Hyacinthus* (Hyacinth)]

HYACINTHUS (Hyacinth)

Bacterium aroideae (Townsend) Stapp: Takimoto, S., 1935-36.

ILLICIUM *anisatum* L.

Gloeosporium illicii Hemmi: Hemmi, T., 1920a.

IMPATIENS *balsamina* L.

Cercospora fukushiana Matsuura: Matsuura, Isamu, 1928.

IRIS

Bacterium iridicola Takimoto: Takimoto, S., 1931d.

JUNCUS

Cercosporina juncicola Hori & Kasai: Kasai, M., 1922.

Sclerotium: Nakata, K., 1933.

JUNCUS *effusus* L. var. *decipiens* Buch.

Cercosporina juncicola Hori & Kasai: Kasai, M., 1923b.

KAOLIANG [see SORGHUM *nervosum* Bess. (Kaoliang)]

KONJAC [see AMORPHOPHALLUS *rivieri* Dur. var. *konjac* (C. Koch) Engler (Konjac)]

KUMQUAT [see FORTUNELLA (Kumquat)]

LACTUCA *sativa* L. (Lettuce)

Disease: Fukushi, T., 1929.

LACTUCA *sativa* L. var. *angustata*

Bacterium lactucae Yamamoto: Yamamoto, Sigeo, 1934.

LEPIRONIA *mucronata* Rich.

Phytophthora lepironiae Sawada: Sawada, Kaneyoshi, 1919a.

LEGUMINOSAE
Ceratophorum setosum Kirchner: Hemmi, T., 1919b.

LEPTOCHLOA chinensis Nees
Helminthosporium leptochloae Nishikado & Miyake: Nishikado, Y., and Miyake, Chuichi, 1924a.

LESPEDEZA
Uromyces: Hiratsuka, Naohide, and Tobina, E., 1935.

LETTUCE [see *LACTUCA sativa* L. (Lettuce)]

LILIUM (Lily)
Bacteria: Bokura, U., 1919.
Botrytis liliorum Fujikuro: Fujikuro, Y., 1914a.
Cercosporella inconspicua (Wint.) v. Höhn.: Hiura, M., 1925.
Rhizopus necans Mass.: Anonymous, 1897c.

LILY [see *LILIUM* (Lily)]

LINUM (Flax)
Colletotrichum lini (Westerdijk) Tochinai: Hiura, M., 1924a.
Colletotrichum linicola Pethybr. & Laff.: Hiura, M., 1923.
Diseases: Oleinikova, V. M., 1935.
Melampsora liniperda (Körn.) Palm: Hiratsuka, Naohide, 1926-28.

LINUM usitatissimum L.
Colletotrichum linicola Pethybr. & Laff.: Hemmi, T., 1920a.

LIQUIDAMBAR formosana Hance
Penicillium (?): Fauvel, A. A., 1884c.

LOQUAT [see *ERIOBOTRYA japonica* Lindl. (Loquat)]

LYCIUM chinense Mill.
Diseases: Itô, Tokutarô, 1887d.
Spegazzini, C., and Itô, Tokutarô, 1888.

LYCOPERSICUM esculentum Mill. (Tomato)
Bacillus aroideae Townsend: Takimoto, S., 1927a.
Phoma destructiva Plowr.: Takimoto, S., 1931g.
Phytophthora terrestris Sherb.: Takimoto, S., 1931g.

MACHILUS longifolia Blume
Cintractia machili Hino & Nagaoka: Hino, Iwao, and Nagaoka, E., 1931.

MACHILUS thunbergii Sieb. & Zucc. var. *glaucescens* Blume
Cintractia machili Hino & Nagaoka: Hino, Iwao, and Nagaoka, E., 1931.

MAHONIA japonica DC.
Gloeosporium japonicum Hemmi: Hemmi, T., 1920a.

MAIZE [see ZEA mays L. (Maize)]

MALLOTUS japonicus Muell.
Aplanobacter malloti Takimoto: Takimoto, S., 1930a.

MALUS (Apple)
Diseases: Takahashi, Yoshimao, and Okamoto, Hanjirô, 1908.
Gymnosporangium yamadae Miyabe: Fukushi, T., 1925.
Tai, Fang-lan, 1929.
Phytophthora cactorum (Leb. & Cohn) Schröt.: Takimoto, S., 1919.
Sclerotinia mali Takahashi: Takahashi, Yoshinao, 1915.
Sphaeropsis malorum Pk.: Takimoto, S., 1923.
Valsa mali Miyabe & Yamada: Togashi, K., 1924b.

MALUS sieboldii Rehd.
Gymnosporangium leve Crowell: Crowell, I. H., 1936.

MECONOPSIS
Disease: Cotton, A. D., 1929.

MELIA azedarach L.
Fomes: Yamamoto, Watarô, 1936.

MICROLESPEDEZA
Uromyces: Hiratsuka, Naohide, and Tobina, E., 1935.

MILLET [see SETARIA (Millet)]
MILLET, ITALIAN [see SETARIA italica (L.) Beauv. (Italian Millet)]

MORUS (Mulberry)
Aecidium mori Barclay: Hiura, M., 1931.
Bacteria: Nomura, H., 1908.
Bacterium mori Boyer & Lambert: Takimoto, S., 1927c.
Coniothyrina mori Yendo & Takase: Yendo, Yasutarô, and Takase, Kiiti, 1932.
Dematophora necatrix Hartig: Nomura, H., 1901b.
Diaporthe: Yamauchi, T., 1930.
Diseases: Hotta, T., 1934.
Sawada, Kaneyoshi, 1912c.
Helicobasidium mompa Tanaka: Tanaka, Nobujirô, 1890f.
Helicobasidium tanakae Miyabe: Ts'ui, Po-t'ang, 1934.
Uredo: Tanaka, Nobujirô, 1890d.

MORUS alba L.
Coryneum mori Nomura: Nomura, H., 1904.
Phoma niphonia Nomura: Nomura, H., 1904.

MULBERRY [see MORUS (Mulberry)]

NARCISSUS
Sporotrichum narcissi Tochinai & Shimada: Tochinai, Yoshihiko, and Shimada, Shoichi, 1930.

NICOTIANA tabacum L. (Tobacco)
Alternaria longipes (Ell. & Ev.) Tisdale & Wadkins: Takimoto, S., 1934c.
Bacillus aroideae Townsend: Nakata, K., 1927a.
Bacterium nicotianum Takimoto: Takimoto, S., 1926.
Colletotrichum: Takimoto, S., 1934d.
Diseases: Nakamura, Hisao, 1932.

ONION [see ALLIUM (Onion)]
ONION, WELSH [see ALLIUM (Welsh Onion)]
ORANGE [see CITRUS (Orange)]
ORNAMENTAL PLANTS [see PLANTS, ORNAMENTAL]

ORYZA sativa L. (Rice)
Absidia: Miyake, Ichirô, and Takada, K., 1922.
Achlya prolifera (Nees) de By.: Abe, Takuji, 1928a.
Hemmi, T., and Abe, T., 1928.
Sawada, Kaneyoshi, 1912d.
Bacterium oryzae (Uyeda & Ishiyama) Nakata: Takeuchi, Haruyoshi, 1930.
Brachysporium oryzae Itô & Ishiyama: Itô, Seiya, and Ishiyama, Tetsuji, 1929.
Dactylaria: Sawada, Kaneyoshi, 1917b.
Dactylaria parasitans Cavara: Shirai, M., 1905b.
Diseases: Chu, Hsüeh-tsêng, 1931.
Hara, Kanesuke, 1918.
Hemmi, T., 1928.
Hori, Shôtarô, 1890.
Itô, Seiya, 1932.
Kurosawa, Gompei, 1911.
Kuwana, S. L., 1930.
Miyake, Ichirô, 1908a, 1909, 1910.
Nishikado, Y., 1917b, 1936.
Nishikado, Y., and Matsumoto, Hiroyoshi, 1932.
Tasugi, H., 1931.
Wei, C. T., 1931, 1934b.
Wood, J. I., 1934.
Epicoccum neglectum Desm.: Itô, Seiya, and Iwadare, S., 1934.
Epicoccum oryzae Itô & Iwadare: Itô, Seiya, and Iwadare, S., 1934.
Fusarium: Setô, F., 1928.
Fusarium heterosporum Nees: Andô, Hirotarô, 1898.
Fujikuro, Y., 1916.
Gibberella fujikuroi (Sawada) Wr.: Itô, Seiya, 1932.
Itô, Seiya, and Kimura, Jinya, 1931.
Nishikado, Y., Matsumoto, Hiroyoshi, and Yamauti, K., 1934b.
Setô, F., 1935.

ORYZA sativa L. (Rice)--Continued

- Gibberella saubinetii (Mont.) Sacc.: Ikeya, J., 1933.
  - Kasai, M., 1923a.
- Helicoma echinosporium Itô & Sasaki: Itô, Seiya, 1932.
- Helminthosporium: Hemmi, T., and Yokogi, K., 1928.
  - Nishikado, Y., 1926b, 1927b.
  - Nishikado, Y., and Miyake, Chuichi, 1922.
- Helminthosporium oryzae Miyabe & Hori: Hori, Shôtarô, 1901f.
  - Kurosawa, Gompei, 1911.
  - Wei, C. T., 1936.
- Hypochnus: Hemmi, T., and Yokogi, K., 1928.
  - Sakurai, Motoi, 1917.
- Lisea fujikuroi Sawada: Kurosawa, Gompei, 1928.
  - Nishikado, Y., and Matsumoto, Hiroyoshi, 1932.
- Ophiobolus miyabeanus Itô & Kuribayashi: Itô, Seiya, 1932.
  - Suzuki, Hashio, 1930.
- Penicillium commune Thom: Miyake, Ichirô, and Tanaka, K., 1922.
- Piricularia grisea Miyabe & Hori: Hori, Shôtarô, 1899.
- Piricularia oryzae Briosi & Cav.: Abramov, I. N., 1928.
  - Hara, Kanesuke, 1911d.
  - Itô, Seiya, 1932.
  - Nishikado, Y., 1927a.
  - Shirai, M., 1905b.
  - "Sueda, Heishichi", 1928.
  - Suzuki, Hashio, 1930, 1934.
- Pseudomonas itoana Tochinai: Tochinai, Yoshihiko, 1932.
- Pseudomonas oryzae Uyeda & Ishiyama: Ishiyama, Shin'ichi, 1928.
- Pythium echinocarpum Itô & Tokunaga: Itô, Seiya, and Tokunaga, Y., 1933.
- Pythium nagaii Itô & Tokunaga: Itô, Seiya, and Tokunaga, Y., 1933.
- Pythium oryzae Itô & Tokunaga: Itô, Seiya, and Tokunaga, Y., 1933.
- Rhizoctonia: Wei, C. T., 1934a.
- Sclerospora: Yamada, Gentarô, 1911b.
- Sclerospora macrospora Sacc.: Yamada, Gentarô, 1911a.
- Sclerotium: Hemmi, T., and Yokogi, K., 1927, 1928.
  - Sakurai, Motoi, 1917.
- Tilletia horrida Takahashi: Takahashi, Yoshinao, 1896.
- Ustilago virens Cke.: Hori, Shôtarô, 1893.
  - Takahashi, Yoshinao, 1896.

PANAX (Ginseng)

- Bacillus araliavorus Uyeda: Uyeda, Yeijirô, 1908b.
- Diseases: Nakata, K., and Takimoto, S., 1922a.
- Phytophthora cactorum (Leb. & Cohn) Schröt.: Hori, Shôtarô, 1907b.
- Sclerotinia: Takimoto, S., 1915a.

PANICUM crus-galli L. [see ECHINOCHLOA crus-galli (L.) Beauv. (Panicum crus-galli L.)]

PANICUM miliaceum L.

- Tolyposporium bullatum Schröt.: Takahashi, Yoshinao, 1902b.
- Ustilago crus-galli Tracy & Earle: Takahashi, Yoshinao, 1902b.

PANICUM miliaceum L.--Continued
  Ustilago panici-miliacei (P.) Wint.: Hori, Shôtarô, 1901c.
    Takahashi, Yoshinao, 1902a.
  Ustilago spacrogona Burr.: Takahashi, Yoshinao, 1902b.

PAPAVER (Poppy)
  Bacterium papavericola Bryan & McWhorter: Takimoto, S., 1931i.
  Bacterium papaveris Takimoto: Takimoto, S., 1935c.
  Helminthosporium: Sawada, Kaneyoshi, 1918a.

PASANIA
  Trametes dickinsii B.: Hemmi, T., 1933.

PASANIA cuspidata Oerst.
  Irpex tabacinoides Yasuda: Yasuda, A., 1919c.

PAULOWNIA
  Gloeosporium kawakamii Miyabe: Yoshii, Hazime, 1928a.
  Witches'-broom: Hori, Shôtarô, 1921c.

PAULOWNIA tomentosa Steud.
  Diseases: Hara, Kanesuke, 1933b.
  Gloeosporium kawakamii Miyabe: Kawakami, Takiya, [1903?].
    Yoshii, Hazime, 1933c.
  Valsa paulowniae Miyabe & Hemmi: Hemmi, T., 1916a, 1916d.

PEA [see PISUM sativum L. (Pea)]
PEACH [see PRUNUS persica (L.) Stokes (Peach)]
PEANUT [see ARACHIS hypogaea L. (Peanut)]
PEAR [see PYRUS (Pear)]
PEPPER [see CAPSICUM (Pepper)]
PERSIMMON [see DIOSPYROS (Persimmon)]
PERSIMMON, JAPANESE [see DIOSPYROS (Japanese Persimmon)]

PETASITES
  Bacterium petasitis Takimoto: Takimoto, S., 1927b.

PE-TSAI [see BRASSICA pekinensis Rupr. (Chinese Cabbage: Pe-tsai)]

PETUNIA violacea Lindl.
  Cercosporina petuniae Saitô: Saitô, Hidesaku, 1931.

PHANEROGAMAE
  Diseases: Patouillard, N., 1886a.

PHASEOLUS (Bean)
  Bacterium phaseoli E. F. Smith: Takimoto, S., 1928a.
  Colletotrichum truncatum (S.) Andrus & Moore: Hwang, Liang, 1935.

PHASEOLUS radiatus L. var. aurea Prain
Colletotrichum phaseolorum Takimoto: Sasaki, Mitsuo, 1936.
Takimoto, S., 1934g.

PHYLLOSTACHYS
Ustilago shiraiana P. Henn.: Hori, Shôtarô, 1905.

PHYLLOSTACHYS nigra Munro var. henonis Stapf
Colletotrichum hsienjenchang Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934a.
Sclerotium japonicum Endô & Hidaka: Endô, Sigeru, and Hidaka, Z., 1935.

PHYLLOSTACHYS reticulata C. Koch
Asterinella hiugensis Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934b.
Colletotrichum hsienjenchang Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934a.
Phragmothyrium japonicum Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934b.
Sclerotium japonicum Endô & Hidaka: Endô, Sigeru, and Hidaka, Z., 1935.

PISUM sativum L. (Pea)
Alternaria fasciculata (Cke. & Ell.) Jones & Grout: Iwadare, S., 1931.
Ascochyta pinodella L. K. Jones: Takimoto, S., 1935a.
Ascochyta pinodes L. K. Jones: Takimoto, S., 1935a.
Ascochyta pisi Lib.: Takimoto, S., 1935a.
Fusarium: Togashi, K., and Tsukamoto, Eiji, 1926-28.
Fusarium anguioides Sherb.: Togashi, K., 1928.
Fusarium arthrosporioides Sherb.: Togashi, K., 1928.
Fusarium sporotrichioides Sherb.: Togashi, K., 1928.
Mycosphaerella pinodes (B. & Blox.) R. E. Stone: Takimoto, S., 1933.

PLANTS
Bacteria: Okabe, N., 1932-35 (Formosa).
Erysiphaceae: Tai, Fang-lan, 1935a (China; Host index).
Fungi: Bencis, C. A., 1927 (Yakutsk).
Chang, Tsu-shun, 1916 (Peking).
Ch'ien, Sui-sun, 1918 (Peking).
Chu, Vong-nay, 1927 (China); 1933a (Chekiang).
Gareshin, S. S., and Transhel, V., 1913 (Irkutsk; Host index).
Hara, Kanesuke, 1928b (Japan).
Hemmi, T., 1926 (Control; Japan).
Ho, Tsun-fung (Japan: Hosts).
Ideta, A., 1932 (Yamagouchi Pref.).
Itô, Seiya, 1921 (Hokkaido); [date ?] (Japan).
Nishikado, Y., Matsumoto, Hiroyoshi, and others, 1927-33 (Index literature; Japan).

PLANTS--Continued

Fungi--Continued

Stevenson, J. A., 1926 (Host index).
Sawada, Kaneyoshi, 1931 (Formosa: Host index).
Tai, Fang-lan, 1936-37 (China; Host index).
Takeuchi, Haruyoshi, and Shimizu, Masayasu, 1930 (Korea).
T'u, Chih, 1930 (China).

Hypochnus centrifugus (Lév.) Tul.: Endô, Sigeru, 1931 (Japan; Hosts).
Ovulariopsis: Sawada, Kaneyoshi, 1930 (Formosa; Host index).
Phyllactinia corylea (P.) Karst.: Sawada, Kaneyoshi, 1930 (Formosa; Host list).
Phytophthora: Tucker, C. M., 1933 (Hosts).
Synchytrium: Kusano, S., 1909 (Hosts).
Uredinales: Jørstad, I., 1934 (Kamchatka; Host index).
Ustulina: Wilkins, W. H., 1934 (Host index).
Valsa: Togashi, K., 1929 (Hosts).
Virus diseases: Fukushi, T., 1932 (Japan; Hosts).
Otero, J. J., and Cook, M. T., 1934 (Bibliography).

PLANTS, CULTIVATED

Anthracnoses: Hemmi, T., and Nojima, T., 1927 (Japan).
Diseases: Asuyama, H., 1935-36 (Japan).
Dosiâtkin, N. L., 1936a (Mongolia).
Fujikuro, Y., 1914c, 1914d, 1918 (Formosa).
Hara, Kanesuke, 1928a (Japan).
Ishiyama, Tetsuji, 1936a, 1936b (s. Sachalin).
Katô, M., [date ?] (Korea).
Kawakami, Takiya, and Suzuki, R., 1908 (Formosa).
Lavrov, N. N., 1932 (Siberia).
Miura, Michiya, 1921-30 (Manchuria).
Nakata, K., and Takimoto, S., 1928 (Korea).
Palchevsky, N. A., 1891 (s. Ussuri).
Porter, R. H., 1926b. (c. China).
Sawada, Kaneyoshi, 1902-12 (Formosa).
Sorokin, N., 1890 (s. Ussuri).
Tsou, Ping-wên, and Tsou, Chung-lin, 1919 (China).

Fusarium: Savari, A. I., 1923b (Primorsk).
Hypochnus: Sawada, Kaneyoshi, 1912b (Formosa).
Typhula: Imai, Sanshi, 1931 (Japan).

PLANTS, ECONOMIC

Diseases: Fukui, Takeji, 1916 (Japan).
Han, Lü-ch'ên, 1927-28 (Kwangtung).
Hori, Shôtarô, 1893, 1910-16 (Japan).
Miyake, Ichirô, 1907 (Japan).
Reinking, O. A., 1919 (s. China).
Shirai, M., 1888-90 (Japan).
T'u, Chih, 1932 (s. China; Host index).
Wang, Schauder, 1934a (Hangchow)

Virus diseases: Ho, William T. H., and Li, L. Y., 1936 (Kwangtung).

PLANTS, ORNAMENTAL
Diseases: Hara, Kanesuke, 1920 (Japan).

PLANTS, WOODY
Diseases: Hara, Kanesuke, 1927b (Japan).

PLANTS, WILD
Diseases: Desiatkin, N. L., 1936a (Mongolia).
Tsou, Ping-wên, and Tsou, Chung-lin, 1919 (China).

PLUM [see PRUNUS (Plum)]

POLYGONATUM
Cylindrosporium komarowi Jaczewski: Jaczewski, A. A., 1900a, 1900d.

POLYGONUM multiflorum Thunb.
Diseases: Spegazzini, C., and Itô, Tokutarô, 1888.
Itô, Tokutarô, 1887d.

POMEGRANATE [see PUNICA (Pomegranate)]
POPPY [see PAPAVER (Poppy)]
POTATO [see SOLANUM tuberosum L. (Potato)]

PRUNUS
Caeoma makinoi Kusano: Kusano, S., 1906.
Thekopsora: Hiratsuka, Naohide, 1927d.

PRUNUS (Japanese Cherry)
Caeoma radiatum Shirai: Shirai, M., 1895d.

PRUNUS (Plum)
Disease: Ishiyama, Shin'ichi, 1922.

PRUNUS cerasus L. (Cherry)
Mycosphaerella cerasella Aderh.: Miyake, Chuichi, 1923.
Thekopsora: Kuprevich, V. F., 1933.

PRUNUS mume Sieb. & Zucc.
Caeoma makinoi Kusano: Kusano, S., 1903a, 1911b.
Camarosporium: Homma, Y., 1927.
Camarosporium persicae Maubl.: Homma, Y., 1926.
Valsa japonica Miyabe & Hemmi: Hemmi, T., 1916c.

PRUNUS padus L.
Thekopsora: Kuprevich, V. F., 1933.

PRUNUS persica (L.) Stokes (Peach)
Camarosporium: Homma, Y., 1927.
Camarosporium persicae Maubl.: Homma, Y., 1926.

PRUNUS persica (L.) Stokes (Peach)--Continued
 Cladosporium carpophilum Thüm.: Fujikuro, Y., 1914f.
 Leucostoma leucostoma F.: Togashi, K., 1930.
 Puccinia pruni-persicae Hori: Hori, Shôtarô, 1912.
 Valsa japonica Miyabe & Hemmi: Togashi, K., 1930.

PRUNUS pseudo-cerasus Lindl.
 Taphria pseudo-cerasus Shirai: Shirai, M., 1895c.

PRUNUS yedoensis Mats.
 Valsa japonica Miyabe & Hemmi: Hemmi, T., 1916c.

PSIDIUM guajava L.
 Myxosporium psidii Sawada & Kurosawa: Kurosawa, Gompei, 1926.

PUERARIA thunbergiana Benth.
 Synchytrium puerariae (P. Henn.) Miyabe: Kusano, S., 1908b.

PUNICA (Pomegranate)
 Zythia versoniana Sacc.: Tai, Fang-lan, and Cheo, C. C., 1933, 1934.

PYRUS (Pear)
 Blight: Reimer, F. C., 1925.
 Colletotrichopsis piri (Noack) Bubák: Kurosawa, Gompei, 1912.
 Diaporthe ambigua Nitschke: Tanaka, Ichirô, 1934.
 Glomerella cingulata (Stonem.) Spauld. & v. Schrenk: Yü, Ta-fu, and Yeh, Ho-ts'ai, 1934.
 Gymnosporangium: Soh You-kuh, [date ?], Chinese append.
 Gymnosporangium haraeanum Syd.: Tai, Fang-lan, 1933.
 Phomopsis: Endô, Sigeru, 1927.
  Nakajima, Tomosuke, and Takimoto, S., 1924.
 Phomopsis fukushii Endô & Tanaka: Tanaka, Sôichi, and Endô, Sigeru, 1930.

PYRUS bretschneideri Rehd.
 Corticium centrifugum (Lév.) Bres.: Cheo, C. C., 1936.

PYRUS serotina Rehd.
 Alternaria kikuchiana Tanaka: Tanaka, Sôichi, 1933.

QUERCUS
 Irpex purpureus Yasuda: Yasuda, A., 1919c.
 Microsphaera dentatae Liou: Liou, Tchen-ngo, 1931b.
 Stereum induratum B.: Hemmi, T., 1933.
 Trametes dickinsii B.: Hemmi, T., 1933.
 Tremella fuciformis B.: Cheng, Chi-hsi, 1934.
 Witches'-brooms: Kusano, S., 1903c.

QUERCUS glandulifera Blume
 Typhulochaeta: Itô, Seiya, 1915b.
 Uncinula septata Salmon: Salmon, E. S., 1900a.

QUERCUS glauca Thunb.
Diseases: Yoshinaga, Torama, 1918.

QUERCUS mongolica Fisch.
Diseases: Kravtzev, B. I., 1935.

RADISH [see RAPHANUS (Radish)]
RAMIE [see BOEHMERIA nivea Gaud. (Ramie)]

RAPHANUS (Radish)
Bacillus aroideae Townsend: Takimoto, S., 1927c.
Bacterium campestre Pammel: Takimoto, S., 1928b.
Bacterium solanacearum E. F. Smith: Takimoto, S., 1930d.

RANUNCULACEAE
Puccinia: Itô, Seiya, 1911a.

RAPHIOLEPIS umbellata Makino
Coleopuccinia: Ido, Kiyoharu, 1935.

RHAMNUS
Rust: Transhel, V., 1934.

RHUS semi-alata Murr. var. osbeckii DC.
Uromyces spiralis Hori: Hori, Shôtarô, 1892a.

RICE [see ORYZA sativa L. (Rice)]

RICINUS communis L. (Castor Oil Plant)
Bacterium ricini Yoshii & Takimoto: Yoshii, Hazime, and Takimoto, S., 1928.
Macrosporium ricini Yoshii: Yoshii, Hazime, 1929a, 1931b.

ROSA (Rose)
Kuehneola rosae Sawada: Sawada, Kaneyoshi, 1918c.
Sphaceloma: Jenkins, A. E., 1932.

ROSACEAE
Sclerotinia: Hanzawa, Jun, 1905a.
Takahashi, Yoshinao, 1911.

ROSE [see ROSA (Rose)]
RUBBER TREE [see HEVEA (Rubber Tree)]

RUBUS
Hamaspora: Hiratsuka, Naohide, 1935f.

RUBUS sieboldii Blume
Phragmidium rubi-sieboldii Kawagoe: Kawagoe, S., 1915b.

SACCHARUM officinarum L. (Sugar Cane)
Cercospora taiwanensis Matsumoto & Yamamoto: Matsumoto, Takashi, and Yamamoto, Watarô, 1934.
Diseases: Ho, William T. H., 1935.
Helminthosporium: Matsumoto, Takashi, and Yamamoto, Watarô, 1935a.

SAGITTARIA trifolia L. var. sinensis Makino
Doassansiopsis horiana (P. Henn.) Nishikado & Matsumoto: Nishikado, Y., and Matsumoto, Hiroyoshi, 1936.

SALIX (Willow)
Gloeosporium: Fukushi, T., 1921.
Melampsora: Matsumoto, Takashi, 1917.
Physalospora miyabeana Fukushi: Fukushi, T., 1921.

SALIX pierotii Miq.
Melampsora chelidonii-pierotii Matsumoto: Matsumoto, Takashi, 1926.

SEMIARUNDINARIA fastuosa Makino
Disease: Kawamura, Seiichi, 1928a.

SEMIARUNDINARIA narihira Mak.
Phragmothyrium japonicum Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934b.
Phragmothyrium semiarundianariae Hino & Hidaka: Hino, Iwao, and Hidaka, Z., 1934b.

SESAMUM
Bacterium sesamicola Takimoto: Takimoto, S., 1927f.
Fusarium vasinfectum Atk.: Terui, M., 1934.

SESAMUM indicum L.
Alternaria sesamicola Kawamura: Kawamura, Eikichi, 1931c.
Macrosporium sesami Kawamura: Kawamura, Eikichi, 1931c.

SETARIA (Millet)
Diseases: Wai, Ngan-shou, 1930.
Yoshino, Kiichi, 1906.

SETARIA italica (L.) Beauv. (Italian Millet)
Sclerospora graminicola (Sacc.) Schröt.: Hiura, M., 1929b, 1935.
Shirai, M., 1897a.

SHRUBS
Diseases: Hara, Kanesuke, 1927a.

SOLANUM melongena L. (Eggplant)
Ascochyta: Takimoto, S., 1927d.
Phomopsis vexans (Sacc. & Syd.) Harter: Takimoto, S., 1927d.
Rhabdospora melongenae Hanzawa: Hanzawa, Jun, 1910b.

SOLANUM tuberosum L. (Potato).
    Bacillus aroideae Townsend: Takimoto, S., 1927a.
    Bacterium solanacearum E. F. Smith: Takimoto, S., 1930b.
    Macrosporium solani Cke.: Yoshii, H., 1929e.
    Phytophthora infestans (Mont.) de By.: Nomura, H., 1901a.

SOPHORA
    Uredineae: Kusano, S., 1904a.
    Uromyces: Kusano, S., 1905c.

SORGHUM nervosum Bess. (Kaoliang)
    Anthracnose: Ch'ên, Hung k'uei, 1928-35.

SOYBEAN [see GLYCINE max Merr. (Soybean)]

SPINACIA oleracea L.
    Colletotrichum spinaciae Ell. & Halst.: Hemmi, T., Kurata, S., and Tohara, Y., 1933.
    Gloeosporium olivarum D'Alm.: Hemmi, T., Kurata, S., and Tohara, Y., 1933.

SPINDLE TREE, JAPANESE [see EVONYMUS japonica L. (Japanese Spindle Tree)]
SQUASH [see CUCURBITA (Squash)]

STEWARTIA pseudo-camellia Maxim.
    Pucciniastrum yoshinagai Hiratsuka f.: Hiratsuka, Naohide, 1931b.

SUGAR BEET [see BETA vulgaris L. (Sugar Beet)]
SUGAR CANE [see SACCHARUM officinarum L. (Sugar Cane)]
SUNFLOWER [see HELIANTHUS (Sunflower)]

SYMPLOCOS japonica A. DC.
    Exobasidium symploci-japonicae Kusano: Kusano, S., 1907c.

TARAXACUM ceratophorum DC.
    Sphaerotheca fuliginea (Schlecht.) Pollacci: Homma, Y., 1934.

TARO [see COLOCASIA (Taro)]
TATAR ASTER [see ASTER tataricus L.f. (Tatar Aster)]
TEA [see THEA (Tea)]

THALICTRUM
    Rust: Transhel, V., 1934.

THEA (Tea)
    Dematophora necatrix Hartig: Nomura, H., 1901b.
    Diseases: Du Pasquier, R., 1933.
        Sawada, Kaneyoshi, 1913b.
    Exobasidium reticulatum Itô & Sawada: Itô, Seiya, and Sawada, Kaneyoshi, 1912.

TOBACCO [see NICOTIANA tabacum L. (Tobacco)]
TOMATO [see LYCOPERSICUM esculentum Mill. (Tomato)]

TREES
  Anthostomella (?): Kitashima, Kimizô, 1925.
    Diseases: Hara, Kanesuke, 1927a.

TREES, FOREST
  Diseases: Liubarskii, L. V., 1934, 1936a.
  Valsa: Togashi, K., 1929.

TREES, FRUIT
  Diseases: Hara, Kanesuke, 1916.
    Ikata, Suehiko, 1927b.
  Sclerotinia: Takahashi, Yoshinao, 1911.
  Valsa: Togashi, K., 1929.

TRIFOLIUM (Red Clover)
  Diseases: Matsuura, Isamu, 1930.

TRIFOLIUM (White Clover)
  Diseases: Matsuura, Isamu, 1930.

TRIFOLIUM repens L.
  Olpidium trifolii (Pass.) Schröt.: Kusano, S., 1929.

TRITICUM (Wheat)
  Cephalosporium gramineum Nishikado & Ikata: Nishikado, Y., Matsumoto, Hiroyoshi, and Yamauti, K., 1934a.
    Nishikado, Y., and Ikata, Suehiko, 1934.
  Diseases: Tai, Fang-lan, 1927b.
  Helminthosporium tritici-vulgaris Nishikado: Nishikado, Y., 1929a.
  Ophiobolus graminis Sacc.: Hori, Shôtarô, 1901c.
  Puccinia: Takahashi, Yoshinao, 1904.
  Puccinia graminis P. var. tritici Erikss. & Henn.: T'u, Chih, 1934.
  Puccinia triticina Erikss.: Bryzgalova, V. A., 1935.
  Tilletia laevis Rabh.: Hori, Shôtarô, 1901a.
  Tilletia tritici (Bjerk.) Wint.: Hori, Shôtarô, 1901a.
  Urocystis occulta (Wallr.) Rabh.: Hori, Shôtarô, 1901b.

TRITICUM vulgare Vill.
  Helminthosporium tritici-vulgaris Nishikado: Nishikado, Y., 1928b.

ULMUS
  Disease: Nishikado, Y., and Matsumoto, Hiroyoshi, 1929a.
  Gnomonia oharana Nishikado & Matsumoto: Nishikado, Y., and Matsumoto, Hiroyoshi, 1929b.

ULMUS parviflora Jacq.
  Gnomonia oharana Nishikado & Matsumoto: Matsumoto, Hiroyoshi, 1931.

UMBELLIFERAE
Puccinia: Miyake, Tsutomu, 1906.
Uredinales: Lindroth, J. I., 1902.

VEGETABLES
Bacillus aroideae Townsend: Takimoto, S., 1927a.
Diseases: Fujikuro, Y., 1917.
Hara, Kanesuke, 1920.

VERONICA arvensis L.
Sorosphaera veronicae Schröt.: Hemmi, T., and Nojima, T., 1934.

VETCH, MILK [see ASTRAGALUS (Milk Vetch)]
VETCH, SAND [see VICIA villosa Roth (Sand Vetch)]

VICIA faba L.
Bacterium viciae Uyeda: Takimoto, S., 1915b.
Gibberella saubinetii (Mont.) Sacc.: Miyake, Chuichi, 1924.
Phytomonas viciae Yü: Yü, Ta-fu, 1936b.

VICIA villosa Roth (Sand Vetch)
Ovularia schwarziana Magn.: Tanaka, Ichirô, and Iwadare, S., 1931c.

VIGNA catjang Walp. var. sinensis King
Cercospora vignicola Kawamura: Kawamura, Eikichi, 1931a.

VITIS (Grape)
Acrospermum viticola Ikata: Ikata, Suehiko, and Hitomi, T., 1931.
Coniothyrium: Nishikado, Y., 1923.
Dematophora necatrix Hartig: Nomura, H., 1901b.
Glomerella rufomaculans Spaulding & v. Schrenk: Hara, Kanesuke, 1911c.
Physalospora: Nishikado, Y., 1923.
Physalospora baccae Cavara: Nishikado, Y., 1921.
Root-neck blight: Hiura, M., 1924b.

WASABIA pungens Matsumura
Bacillus alliariae Ômori: Ômori, J., 1896c.

WEEDS
Diseases: Desiatkin, N. L., 1936a
Fungi: Hanzawa, Jun, 1910a.

WHEAT [see TRITICUM (Wheat)]
WILD PLANTS [see PLANTS, WILD]
WILLOW [see SALIX (Willow)]

WISTARIA
Bacillus millettiae Kawakami & Ikata: Hino, Iwao, 1933b.

WOOD
Chlorosplenium aeruginellum (Nyl.) Karst.: Akai, S., 1934.
Chlorosplenium aeruginosum (Oeder) Karst.: Akai, S., 1934.
Decay: Burt, E. A., 1931.
Wai, Ngan-shou, 1928.
Sap stain: Nishikado, Y., and Yamauti, K., 1933-35.

WOODY PLANTS [see PLANTS, WOODY]
YAM [see DIOSCOREA (Yam)]

ZEA mays L. (Maize)
Diseases: Nishikado, Y., 1926a.
Helminthosporium: Nishikado, Y., and Miyake, Chuichi, 1926b.
Yü, Ta-fu, 1933.
Helminthosporium maydis Nishikado & Miyake: Nishikado, Y., and Miyake, Chuichi, 1926a, 1926c.
Helminthosporium turcicum Passerini: Nishikado, Y., and Miyake, Chuichi, 1926a, 1926c.
Ophiobolus heterostrophus Drechsler: Nishikado, Y., and Miyake, Chuichi, 1926c.
Yü, Ta-fu, 1933.

ZINGIBER officinale Roscoe
Pseudomonas zingiberi Uyeda: Uyeda, Yei jirô, 1908a.

INVERTEBRATA

ARACHNIDA (Spider)
Isaria arachnophila Ditm. ex P.: Yasuda, A., 1894c.

BOMBYX mori L. (Silk Worm)
Aspergillus flavus Lk.: Nomura, H., 1897.
Aspergillus glaucus Lk.: Nomura, H., 1897.

COLEOPTERA (Beetle)
Tilachlidiopsis: Yakushiki, E., and Kumazawa, M., 1930c.

HOMOPTERA (Scale Insect)
Fungi: Miyabe, K., and Sawada, Kaneyoshi, 1913.
Sawada, Kaneyoshi, 1914d.

HYMENOPTERA (Ant)
Fungi: Bequaert, J., 1922.

INSECTA
Fungi: Hara, Kanesuke, 1914b.
Petch, T., 1914, 1921, 1931-35.
Sawada, Kaneyoshi, 1914b.

LATOUCHIA japonica Kishida
Isaria atypicola Yasuda: Yakushiji, E., and Kumazawa, M., 1930d.

PYRAUSTA nubilalis Hübner
Beauveria bassiana (Bals.) Vuill.: Lefebvre, C. L., 1931.
Beauveria globulifera (Speg.) Picard: Lefebvre, C. L., 1931.

THE PLANT DISEASE REPORTER

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Supplement 123

PRELIMINARY HOST INDEX

TO FUNGI OF MOUNT SHASTA, CALIFORNIA

October 1, 1940

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

PRELIMINARY HOST INDEX TO FUNGI OF MOUNT SHASTA, CALIFORNIA

By Wm. Bridge Cooke 1/

Plant Disease Reporter
Supplement 123 October 1, 1940.

During the summers of 1937, 1938, and 1939, the writer had the privilege of spending at least three months each summer at timberline on the southwest slopes of Mount Shasta, California. The area studied lies in the Mount Shasta Recreational Area of the Shasta National Forest in south-central Siskiyou County. Mt. Shasta is a Cascade volcano with a comparatively poor flora of few more than 400 species of flowering plants. The area studied roughly coincides with that described in "A Flora of Mount Shasta", by the writer, published in the American Midland Naturalist for May-June 1940.

The collection of saprobic species of fungi was largely confined to a brief period of time during and immediately following the rapid melting of the winter snows in late June and early July. At those times, because of inconvenience of reaching other stands, the fungi saprobic on Abies magnifica var. shastensis, the Shasta red fir, have been collected most intensively. While Pinus albicaulis, the white-bark pine, occurred near my headquarters, the Shasta Alpine Lodge at Horse Camp, it was rather free from such fungi. Saprobic species on Tsuga mertensiana, the mountain hemlock, were not collected thoroughly because of the locations of the two large communities of this tree.

Of the parasitic fungi several seem to be reported from California for the first time, especially in the groups of rusts and smuts. Leaf spots are very infrequent.

I am indebted to the following persons for assistance with determinations: Dr. D. H. Linder, Farlow Herbarium; Dr. A. H. Smith, University of Michigan; Dr. Lee Bonar, University of California; Dr. Roderick Sprague, Division of Cereal Crops and Diseases, U. S. Bureau of Plant Industry; Dr. Fred J. Seaver, New York Botanical Gardens; Dr. George L. Zundel, Pennsylvania State College; Dr. L. E. Wehmeyer, University of Michigan; Dr. Ruth Remsberg, Cornell University; Dr. G. W. Martin, State University of Iowa; and Dr. A. J. Mix,

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1/ Custodian of the Shasta Alpine Lodge for the Sierra Club of California

University of Kansas. I am also indebted to Dr. J. H. Hoskins and the Botany Department of the University of Cincinnati for use of laboratory space and equipment while studying many of these species.

A number in brackets following the name of a species, (Exs.1), indicates the number of the fungus in the writer's recently issued exsiccati.

Abies concolor Lindl. & Gord.
Hypoderma robustum Tub. (Exs. 69)

Abies magnifica Murr. var. shastensis Lemmon
Armillaria sp. Rhizomorphs seen.
Botryobasidium ochraceum (Mass.) Donk
Coniophora olivaceus (Fr.) Karst.
Corticium cremoricolor Berk. & Curt.
Corticium roseum Pers. ex Fr.
Corticium scutellare Berk. & Curt.
Cryptoporus volvatus (Pk.) Hubbard
?Cylindrocolla sp. Probably the imperfect stage of Guepiniopsis alpinus
Dacrymyces deliquescens (Bull.) DBy. Both perfect and imperfect stages collected together.
Dasyscypha arida (Phil.) Sacc. (Exs.66)
Dasyscypha sp.
Echinodontium tinctorum Ell. & Ev.
Fomes annosus (Fr.) Cke.
Fomes subroseus (Fr.) Cke.
Flammula penetrans (Fr.) Quel.
Ganoderma oregonensis Murr.
Guepiniopsis alpinus (Tr. & Earle) Brasfield (Exs. 50)
Hymenochaete rugispora Ell. & Ev. (Exs. 45)
Hysterographium formosum (Cke.) Sacc. (Exs. 34)
Lachnellula chrysophthalma (Pers.) Karst.
Merulius americanus Burt (Exs. 46)
Merulius bellus Berk. & Curt. (Exs. 47)
Merulius ceracellus Berk. & Curt. (Exs. 48)
Neopeckia coulteri (Pk.) Sacc.
Odontotrema minus Nyl.
Oxydontia alboviride (Morgan) Miller
Patella scutellata (L.) Morgan
Phlebia centrifuga Karst.
Pleurotus petaloides (Fr.) Quel.
Polyporus abietinus Fr.
Polyporus alboluteus Ell. & Ev. (Exs. 49)
Polyporus leucospongia Cke. & Hark. (Exs. 30A)

Abies magnifica Murr. var. shastensis Lemmon (Continued)
Poria candidissima (Schw.) Sacc.
Poria lenis Karst.
Poria subincarnata (Pk.) Murr. (Exs. 57)
Sepedonium chrysospermum (Bull.) Fr.
Solenia candida Pers. ex Fr. (Exs. 44)
?Sorangium sp. A member of the Myxobacteriaceae.
Sphaeridium luteum v. Hoehn.
Tilachlidium tomentosum (Schrad.) Lindau
Trametes pini Fr. var. abietis Karst.
Tremellodon gelatinosum Pers. ex Fr.
Tulasnella fuscoviolacea Bres.
Tympanis pinastri (Tul.) Rehm.

Agoseris scorzoneraefolia Greene
Puccinia hieracii (Schum.) Mart.

Agrostis exarata Trin.
Erysiphe graminis DC. (Exs. 20)

Allium validum Wats.
Uromyces aureus Diet. & Holw. (Exs. 15)

Amelanchier alnifolia Nutt.
Gymnosporangium libocedri (P. Henn.) Kern (Exs. 37)

Arabis platysperma Gray var. howellii (Wats.) Jepson
Puccinia monoica (Pk.) Arth.

Arctostaphylos nevadensis Gray
Exobasidium vaccinii (Fckl.) Wor.
Exobasidium vaccinii-uliginosii Bond.
Phyllosticta amicta Ell. & Ev. (Exs. 51)

Arctostaphylos patula Greene
Cryptostictis arbuti (Bonar) Zeller
Exobasidium vaccinii-uliginosii Bond. (Exs. 25)
Godronia sp.

Arnica mollis Hook.
Sphaerotheca humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. (Exs. 23)

Asarum hartwegii Wats.
Synchytrium asari Arth. & Holw.

Athyrium americanum (Butters) Maxon
Hysterium magnosporum Ger. (Exs. 33)

Bromus carinatus Hook. & Arn.
    Scolecotrichum graminis (Pers.) Fckl.
    Puccinia glumarum (Schmidt) Erikss. & Henn.
    Ustilago bromivora (Tul.) Fisch. (Exs. 43)

Calyptridium umbellatum (Torr.) Greene var. caudicifera (Gray) Jepson
    Uromyces spragueae Hark. (Exs.18)

Cardamine bellidifolia L. var. pachyphylla Cov. & Leib.
    Puccinia cruciferarum Rud.

Carex brainerdii Mkze.
    Puccinia extensicola Plowr. (Exs. 5)

Carex spectabilis Dewey
    Cintractia caricis (Pers.) Magn. (Exs. 65)
    Cintractia externa (Griff.) Clint.

Carex sp.
    Cladosporium herbarum (Pers.) Lk.

Castanopsis chrysophylla A.DC.
    Dothidella castanicola (Ell. & Ev.) Bonar (Exs. 28)
    Taphrina castanopsidis Ell. & Ev. ex Jenkins

Castilleja arachnoidea Greenm.
    Phoma herbarum Westd.
    Sphaeropsis microscopicum Tassi

Chamaesaracha nana Gray
    Puccinia chamaesarachae Syd. (Exs. 4)

Chrysothamnus nauseosus (Pall.) Britt. var. occidentalis (Greene) Hall
    Epochnium isthmorphorum Sacc.

Cryptantha affinis (Gray) Greene
    Erysiphe cichoracearum DC.

Cymopterus terebinthinus (Hook.) T. & G.
    Puccinia jonesii Pk. var. cymopteri (Diet. & Holw.) Arth. (Exs. 8)
    Puccinia pseudocymopteri Holw.

Cystopteris fragilis (L.) Bernh.
    Hyalopsora polypodii (Pers.) Magn. (Exs. 38)

Delphinium pauciflorum Nutt.
    Ramularia delphinii Jaap

Elymus glaucus Buckl. var jepsonii Davy
    Puccinia glumarum (Schmidt) Erikss. & Henn. (Exs. 6)

Epilobium clavatum Trel.
    Puccinia scandica Johanss. (Exs. 11)

Epilobium hornemannii Hausskn.
    Sphaerotheca epilobii (Lk.) Duby

Epilobium lactiflorum Hausskn.
    Sphaerotheca epilobii (Lk.) Duby (Exs. 41A)

Erigeron inornatus Gray
    Erysiphe cichoracearum DC. (Exs. 19)

Eriogonum latifolium Smith ssp. nudum (Dougl.) Stokes
    Uromyces intricatus Cke.

Eriogonum marifolium T. & G.
    Erysiphe polygoni DC.
    Uromyces intricatus Cke. (Exs. 17)

Ganoderma oregonensis Murr.
    Hypomyces aurantius (Pers.) Fckl.

Gayophytum ramosissimum T. & G.
    Puccinia vagans (DC.) Arth. var. gayophytii Arth. (Exs. 12)

Glyceria elata (Nash) Hitchc.
    Scolecotrichum graminis (Pers.) Fckl.

Hieracium albiflorum Hook.
    Puccinia hieracii (Schum.) Mart. (Exs.7)

Juncus balticus Willd.var. montanus Engelm.
    Leptosphaeria juncicola Karst. (Exs. 68)
    Scelobelonium melanosporum (Rehm.) v. Hoehn. (Exs. 68)

Juncus parryi Engelm.
    Cintractia californica Zundel (Exs. 64)[2]
    Dothidella junci (Fr.) Sacc. (Exs. 40A)
    Uromyces junci (Desm.) L. Tul. (Exs. 39A)

Juncus sp.
    Heteropatella alpina (Ell. & Ev.) W. B. Cooke

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[2] Species first published in Exsiccati under given number.

Kelloggia galioides Torr.
    ?Placosphaeria sp.

Libocedrus decurrens Torr.
    Gymnosporangium libocedri (P. Henn.) Kern (Exs. 1)
    Patella scutellata (L.) Morgan

Ligusticum grayi C. & R.
    Heteropatella alpina (Ell. & Ev.) W. B. Cooke (Exs. 28A)
    Nyssopsora echinata (Lév.) Arth. (Exs. 3)
    Puccinia ligustici Ell. & Ev. (Exs. 41)

Lupinus albicaulis Dougl. var. shastensis C.P.Smith
    Phyllosticta ferax Ell. & Ev. (Exs. 52)
    Pleospora amplispora Ell. & Ev. (Exs. 54)

Lupinus obtusilobus Heller
    Mollisia sp.
    Pleospora balsamorhizae Tr. & Earle (Exs. 55)
    Typhula sp.

Monardella odoratissima Benth.
    Phyllosticta monardellae W. B. Cooke (Exs. 70) 2/
    Placosphaeria shastensis Sprague & W. B. Cooke (Exs. 31)
    Pleospora permunda Cke. (Exs. 31)
    Puccinia menthae Pers. (Exs. 9)
    Stemphyllum sp.

Osmorrhiza nuda Torr.
    Puccinia pimpinellae (Str.) Mart.

Pedicularis densiflora Benth.
    Puccinia rufescens Diet. & Holw.

Pentstemon deustus Dougl. ssp. typicus Keck
    Puccinia pentstemonis Pk. (Exs. 10)

Pentstemon gracilentus Gray
    Pleospora permunda Cke. (Exs. 36)

Pentstemon newberryi Gray
    Puccinia palmeri Diet. & Holw. (Exs. 42)

Phlox douglasii Hook.
    Macrophoma cylindrospora (Desm.) Berl. & Vogl.

Pinus albicaulis Engelm.
?Allantophomopsis sp.
Dasyscypha arida (Phil.) Sacc.
Guepiniopsis alpinus (Tr. & Earle) Brasfield. Seen, but not collected.
Hysterographium formosum (Cke.) Sacc.
Lentinus lepideus Fr.
Lophodermium pinastri (Schrad.) Chev. (Exs. 53)
Neopeckia coulteri (Pk.) Sacc. (Exs. 35)
Phoma harknessii Sacc.
Polyporus leucospongia Cke. & Hark.
Tympanis pinastri (Tul.) Rehm.

Pinus contorta Dougl. var. Murrayana Engelm.
Cronartium comptoniae Arth.

Pinus lambertiana Dougl.
Armillaria sp. Rhizomorphs seen.

Pinus ponderosa Dougl.
Lentinus lepideus Fr.
Poria rufa (Schrad. ex Fr.) Cke.

Poa pratensis L.
Erysiphe graminis DC. (Exs. 26)
Helminthosporium vagans Drechs. (Exs. 30)

Polygonum shastense Brewer
Ustilago shastense Zundel (Exs. 63) 2/

Prunus emarginata (Dougl.) Walp.
Taphrina flectans Mix (Exs. 25)

Pteridium aquilinum (L.) Roth ex Mertens var. pubescens Underw.
Gloeosporium pteridis Hark. (Exs. 29)

Salix scouleriana Barr.
?Torula crustacea Schw.?

Salix sitchensis Bong.
Melampsora arctica Rostr. (Exs. 2)

Senecio aronicioides DC.
Ramularia senecionis (Berk. & Br.) Sacc. var. carniolica Jaap (Exs.32)

Sisymbrium altissimum L.
Cystopus candidus (Pers.) Lév.

Sitanion hansenii (Scribn.) J. G. Smith
    Puccinia glumarum (Schmidt) Erikss. & Henn. (Exs. 40)
    Ustilago hypodytes (Schl.) Fr. (Exs. 58)

Sitanion hystrix (Nutt.) J.G.Smith
    Erysiphe graminis DC. (Exs. 27)
    Phoma herbarum Westd.
    Ustilago hypodytes (Schl.) Fr. (Exs. 59)
    Ustilago minima Arth. (Exs. 62)

Stellaria longipes Goldie
    Melampsorella cerastii (Pers.) Schroet. (Exs. 39)

Stipa californica Merr. & Davy
    Ustilago hypodytes (Schl.) Fr. (Exs. 60)

Stipa occidentalis Thurb.
    Anguina sp.
    Scolecotrichum graminis (Pers.) Fckl.
    Ustilago hypodytes (Schl.) Fr. (Exs. 61)

Streptanthus orbiculatus Greene
    Naemosphaera shastensis Sprague & W. B. Cooke

Trisetum spicatum (L.) Richt.
    Puccinia rubigo-vera (DC.) Wint.

Tsuga mertensiana (Bong.) Sarg.
    Dasyscypha agassizii (Berk. & Curt.) Sacc.
    Guepiniopsis alpinus (Tr. & Earle) Brasfield
    Poria vaporaria (Fr.) Cke.

Vaccinium caespitosum Michx.
    Pucciniastrum goeppertianum (Kühn) Kleb. (Exs. 13)
    Pucciniastrum myrtillii (Schum.) Arth. (Exs. 14)

Vicia americana Muhl.
    Erysiphe polygoni DC. (Exs. 21)
    Uromyces fabae (Pers.) DBy. (Exs. 16)

Viola purpurea Kell.
    Sphaerotheca humuli (DC.) Burr. (Exs. 22)

On various dead grasses, sedges and rushes (leaves and stems which have overwintered in situ in clumps or in springs).
    Cladosporium herbarum (Pers.) Lk.
    Phoma herbarum Westd.
    Typhula sp.

On old boards (Shasta Fir or Yellow Pine)
    Dasyscypha agassizii (Berk. & Curt.) Sacc. (Exs. 67)

On the ground and on or under duff
    Calodon amicum Quel. (Exs. 56)
    Coprinus comatus Fr.
    Discina ancilis (Pers.) Sacc.
    Helvella californica Phill.
    Paxina nigrella Seaver
    Peziza sp.
    Polyporus perennis Fr.
    Pseudoplectania fulgens (Pers.) Fckl.

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PROCEEDINGS OF THE THIRD NATIONAL PLANT NEMATODE CONFERENCE

November 1, 1940

PROCEEDINGS OF THE THIRD NATIONAL PLANT NEMATODE CONFERENCE

First Annual Meeting of the Plant Nematode Conference
Birmingham, Alabama, February 9, 1940

In Connection with the Annual Convention of the
Association of Southern Agricultural Workers

Edited by
Howard P. Barss, U. S. Department of Agriculture

Plant Disease Reporter
Supplement 124

November 1, 1940

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LIST OF PERSONS IN ATTENDANCE:

G. M. Armstrong	Clemson Agricultural College, Clemson, S. C.
H. D. Barker	Bureau of Plant Industry, U.S.D.A., Washington, D. C.
H. P. Barss	Office of Experiment Stations, U.S.D.A., Washington, D. C.
John T. Belue	Extension Specialist in Cotton, Auburn, Ala.
A. N. Brooks	Agricultural Experiment Station, Lakeland, Fla.
K. Starr Chester	Agricultural Experiment Station, Stillwater, Okla.
E. E. Clayton	Bureau of Plant Industry, U.S.D.A., Washington, D. C.
A. A. Dunlap	Agricultural Experiment Station, College Station, Texas.
J. C. Frink	Alabama Polytechnic Institute, Auburn, Ala.
G. H. Godfrey	Texas Substation No. 15, Weslaco, Texas.
A. L. Harrison	Agricultural Experiment Station, Yoakum, Texas
R. J. Haskell	Extension Service, U.S.D.A., Washington, D. C.
H. H. Hume	University of Florida, Gainesville, Fla.
G. A. Jenkins	Agricultural Experiment Station, Experiment Ga.
C. C. Johnson	Innis Speiden & Co., New York City.
C. J. King	U. S. Field Station, Sacaton, Ariz.
S. G. Lehman	Agricultural Experiment Station, Raleigh, N. C.
C. W. McBeth	Coastal Plain Experiment Station, Tifton, Ga.
G. K. Middleton	Agricultural Experiment Station, Raleigh, N. C.
L. E. Miles	Agricultural Experiment Station, State College, Miss.
K. P. Morris	State Department of Agriculture, Tarrant, Ala.
E. G. Moss	Tobacco Experiment Station, Oxford, N. C.
Juliette Oliveira	Pineapple Experiment Station, Honolulu, Hawaii.
R. F. Poole	Agricultural Experiment Station, Raleigh, N. C.
C. D. Sherbakoff	Agricultural Experiment Station, Knoxville, Tenn.
B. T. Simms	U. S. Regional Animal Disease Laboratory, Auburn, Ala.
A. L. Smith	Agricultural Experiment Station, Experiment, Ga.
A. D. Stuart	North Carolina State College, Raleigh, N. C.
A. L. Taylor	Coastal Plain Experiment Station, Tifton, Ga.
W. H. Tisdale	DuPont Company, Wilmington, Del.
B. L. Wade	U. S. Regional Veg. Breeding Laboratory, Charleston, S. C
J. L. Weimer	U. S. Bureau of Plant Industry, Griffin, Ga.
W. J. Wilson, Jr.	Fruit & Truck Experiment Station, Hammond, La.
P. A. Young	Agricultural Experiment Station, Jacksonville, Texas.

OFFICIAL BUSINESS

The conference was called to order by the Chairman, Dean H. Harold Hume. Howard P. Barss was asked to serve as secretary for the meeting.

Professor Hume briefly called attention to the seriousness of the problem created in the United States, particularly throughout the southern half, by the microscopic plant parasites known as eelworms or nematodes. He stressed the fact that no group of parasites of equal importance had been so neglected from the research standpoint. Although it has been suggested by those closely in touch with the situation that no single plant pest is probably responsible for a larger amount of loss to the farmers of the country, year after year, than the root-knot nematode, because it attacks such a wide range of important crop plants, there still has been but a relatively small amount of work thus far on selection and breeding for nematode resistance in these major crops. He declared that the situation created a challenge to the agricultural experiment stations and the scientific workers in the Government to aid agriculture in finding effective ways of cooperating with the numerous plant nematode problems. He urged workers to cooperate with each other in a more vigorous attack on nematode problems and expressed gratification that the evidences of progress were so encouraging at the present time as testified by the titles of the papers to be presented at this conference.

Dean Hume then stated that the Committee on Arrangements for the conference had met the previous evening and had decided to recommend the establishment of a permanent organization. The secretary was then called upon to read the recommendations of the committee. After a brief, favorable discussion the recommendations were adopted without dissent and the Plant Nematode Council came into existence. The recommendations follow:

THE PLANT NEMATODE COUNCIL:

The Recommendations of the Plant Nematode Committee adopted by the Third National Plant Nematode Conference at

Birmingham, Alabama, February 9, 1940.

It is the recommendation of the present committee that this organization be made permanent.

That it shall be known as the Plant Nematode Council.

That its purpose shall be to promote research on plant nematode problems and to facilitate mutual assistance among the workers.

That membership shall be given to all interested in plant nematode research.

That the existing committee shall become the executive committee; that it shall have power to increase or otherwise change its membership, and to select a chairman and a secretary; and that it shall prepare and submit to the membership a program of suggested activities.

The Executive Committee met immediately after the conference and elected Dean H. Harold Hume, University of Florida, chairman and Howard P. Barss, U. S. Department of Agriculture, as secretary. G. H. Godfrey, of Texas, R. J. Haskell of the U. S. Extension Service, H. D. Barker of the U. S. Bureau of Plant Industry, and B. L. Wade of the Southeastern Regional Vegetable Breeding Laboratory, were added to the Executive Committee which already consisted of H. Harold Hume, Florida, H. P. Stuckey, Georgia, R. F. Poole, North Carolina, C. D. Sherbakoff, Tennessee, S. A. Wingard, Virginia, K. C. Barrons, Michigan, and G. Steiner and E. E. Clayton, U. S. Department of Agriculture.

It was tentatively agreed to hold another general conference of all interested in plant nematode research the following year, preferably in conjunction with the Association of Southern Agricultural Workers. It was decided that one of the first steps of the Council should be to work out, if possible, a means whereby workers in various states could cooperate in more systematic testing of varieties of crop plants, forage plants, erosion-control plants, as well as other kinds of plants for resistance to nematodes.

ABSTRACTS OF PAPERS ON THE PROGRAM

The following contributions were made to the program, most of which were presented in person. Others sent in by workers who could not attend were read before the session. One or two are included which failed to arrive in time for presentation but whose contents were deemed of interest to those working with plant nematode problems.

INDUCING UNIFORM SOIL INFESTATIONS OF THE NEMATODE HETERODERA MARIONI AS AN AID IN BREEDING FOR RESISTANCE TO ROOT KNOT. Keith C. Barrons, Michigan State College, East Lansing, Michigan.—In connection with breeding work on root-knot resistance in beans and cowpeas at the Alabama Experiment Station preliminary experiments indicated that even in soil badly infested with nematodes, considerable variation occurred in the degree of root-knot infestation even among the plants of relatively pure varieties. Insuring a uniform and severe epidemic is a major problem in testing plants for resistance to any disease, particularly in breeding work when making individual plant selections.

In a test for uniformity of root-knot infestation, lima beans and snap beans were grown in naturally infested soil, but in alternate rows about 50 g. of severely knotted, chopped-up tomato and bean roots were put into each yard of furrow below seed level prior to planting. When the plants were dug up a distinctly "spotted" condition of infestation was disclosed, particularly on the uninoculated rows. Inoculation, however, had increased the amount of root knot in the lightly infested areas. Relatively large quantities of inoculum were added to the soil on several occasions in an effort to establish a uniform infestation plot, but tests with Henderson Bush lima showed wide variation in attack and often a distinctly spotted condition. Many of the plants always appeared lightly infested.

A plot of about 1,000 tomato plants was then inoculated by mixing a small handful of root-knot inoculum in the soil under each transplant when set. About 90 percent became heavily infested. Again, with varieties of the common bean and lima bean, a small handful of inoculum was mixed with the soil in a 6-inch area 6 inches deep in each hill before planting. When dug in 12 weeks, little variation was noted in the degree of infestation within a variety, practically all plants of susceptible varieties being heavily infested.

In a number of breeding experiments where this method was used rather uniform soil infestation was obtained as indicated by tests with a highly susceptible kind. The results were never perfect. Always a few plants appeared intermediate and few lightly infested. Even though absolutely uniform root-knot infestations cannot be induced, the methods described are of definite value in reducing variation and thus increasing the dependability of results. However, in developing resistant crops, further knowledge concerning the occurrence of geographic races as well as host-specialized races of the root knot nematode would also be of considerable value to the plant breeder.

REMARKS ON ADDITIONS TO A LIST OF HOSTS OF THE ROOT-KNOT NEMATODE. Edna M. Buhrer, U. S. Department of Agriculture, Washington, D. C.—Fifty-five new host plants of the root-knot nematode, representing most of the continents of the world, have been added to records in the Division of Nematology (U. S. Department of Agriculture) since additions to the 1933 list were published in the Plant Disease Reporter for July 1, 1938. There are now 1,387 species, representing 125 families. Specific remarks were made about infestations on _Lespedeza stipulacea_, Korean lespedeza, _Pinus lambertiana_, sugar pine, and other plants.

RESISTANCE TO ROOT KNOT NEMATODE IN NICOTIANA. E. E. Clayton, U. S. Department of Agriculture, Washington, D. C.—Studies on the carry-over of nematode populations following cropping with peanuts, resistant soybeans and cowpeas, cotton, corn, etc., have shown that only a few crops are resistant enough to actually starve out the nematodes. Even Brabham peas and corn are sufficiently parasitized to cary over maximum nematode populations.

There is an important difference between apparently resistant and definitely immune plants. To provide a sound basis for the breeding of either resistant or immune tobaccos, extensive tests have been made with the cultivated *N. tabacum* and other *Nicotiana* species.

Within *N. tabacum* varying degrees of resistance were found, evidently conditioned by a number of genes. Encouragingly, it has been possible (1) to eliminate certain lines, like White Honduras, where nematode resistance is apparently linked closely with a number of undesirable growth characters; (2) to eliminate many lines with intermediate types of resistance; and (3) to locate, and establish, with repeated selfing, apparently homozygous lines of *N. tabacum* with a rather high degree of nematode resistance. These lines are now being used in first and second back crosses.

Many of the species of *Nicotiana* were found highly susceptible, as *bigelovii*, *maritima*, *langsdorffii*, *glutinosa*, and *goodspeedii*. Others, however, are highly resistant to immune. These include *longiflora*, *megalosiphon* *repanda*, *nudicaulis*, and *nesophila*. Such species provide genetic material far superior, from the viewpoint of resistance, to anything discovered within *N. tabacum*. With the new methods of inducing polyploidy, the problem of inter-species crosses has been much simplified. Thus work is proceeding with a *tabacum* X *glauca* tetraploid with a view to transferring the high nematode resistance of *glauca* to *tabacum*. Similar work is in progress with other highly resistant to immune *Nicotiana* species.

The ultimate aim is to produce locally well-adapted commercial tobacco varieties that are nematode-resistant and to develop basic breeding stocks available to anyone undertaking a tobacco-breeding project in which nematode resistance is an object. To this end an attempt is being made to eliminate, if possible, down to a single source of near-immunity that is conditioned by one or two genes. In tobacco present resistance is of an intermediate type dependent upon multiple factors and hard to use. The need for near-immune, easily handled basic breeding materials has led us to give much attention to the other *Nicotiana* species, rather than to confine attention to the resistance occurring in cultivated tobaccos.

THE BULB NEMATODE (DITYLENCHUS DIPSACI) IN NARCISSUS PLANTINGS IN WESTERN OREGON. Chas. A. Cole, State Department of Agriculture, Salem, Oregon.—The State of Oregon, together with the State of Washington, produce more than 100,000,000 narcissus bulbs each season and the crop is an important item in the nursery income of these 2 States. In our field work in nematode control it seems to us that the resistance of the bulb nematode to hot water treatment varies with the section within the State. In order to test out this idea, a series of experiments are being conducted in cooperation with Mr. W. D. Courtney, Assistant Nematologist of the U. S. Department of Agriculture.

The established method of treating for 2 1/2 hours at 110° to 111 1/2°F., first used in Oregon, was not effective in practice and the period has been increased to 4 hours. We find that with some varieties even a 4-hour treatment does not always give a complete kill. This makes us wonder if the cell structure of some varieties renders them heat resistant. The latest control methods used in this State include a presoak at 70°F. for not less than an hour, a precook at 110° to 111 1/2° for 45 minutes and a 4-hour treatment at that temperature. One pint of formaldehyde is added to each 35 gallons of water in the bath to prevent basal rot. It also makes the treatment for nematode more effective.

In field observations over 3 years, following treatment at 2 1/2, 3, and 4 hours, no evidence of nematode would show up during the bloom inspection the next spring but it would appear, at least in the 2 1/2 hour treated lots, in the foliage the second season, especially in the Portland and Brookings sections. In the Tillamook section a 3 or 3 1/2-hour treating period eliminated the nematode. Some details of the hot water treatment of narcissus need further study to determine the proper time for digging and treating. Furthermore, we find that it is almost impossible to eliminate the nematode from Chinese Lily and Paper White Narcissus. This nematode control is quite a problem with us, as our quarantine now requires the treatment of all planting stock every 2 years whether infested with nematode or not.

SOME OBSERVATIONS ON THE DEVELOPMENT OF ROOT-KNOT NEMATODE DISEASES IN VIRGINIA. S. P. Fenne, Extension Service, Blacksburg, Virginia.--In Caroline County, where farmers have been growing certified Nancy Hall sweet potatoes, it was found during the past year that certain fields on at least 2 farms were heavily infested with root knot. In working with these growers in an attempt to give them a rotation that will reduce the nematode population, the supposedly resistant Laredo soybeans were grown. Just before cutting time these beans were examined and found to be very heavily infested with root knot. Some of the roots were an inch or more in diameter. The second situation exists in the 4 counties of the Northern Neck, Virginia, where tomato plants from a State farther south have been used for the last 2 or 3 years. Some of the plants obtained last year were badly infested with root knot, resulting in a decreased yield of from 15 to 75 percent in some cases. Growers in that area are now demanding that a quarantine be set up to prevent the entry of root-knot infested plants.

HOT WATER TREATMENT FOR THE CONTROL OF NEMATODES IN WOODY PLANTS. G. H. Godfrey, Lower Rio Grande Experiment Station, Weslaco, Texas.--Abstract not received.

SOME SUGGESTIONS FOR QUICK TESTING OF NEMATODE RESISTANCE IN PLANT BREEDING PROGRAMS. G. H. Godfrey, Lower Rio Grande Experiment Station, Weslaco, Texas.--Reference is made to an earlier paper, (Some techniques used in the study of the root-knot nematode, Heterodera radicicola. Phytopath. 21: 323-329), with the suggestion that certain phases of the technique described therein might be used to advantage for obtaining quick readings on root-knot nematode resistance in plant breeding programs. Careful application of the method would eliminate the complication and delay brought about by chance "escape" from infestation on the part of a few plants in a progeny population.

CONTROLLING ROOT-KNOT NEMATODES IN POTATOES IN THE KLAMATH BASIN BY MEANS OF IRRIGATION. A. E. Gross, Oregon Agricultural Experiment Station, Corvallis, Oregon.--The root-knot nematode, (Heterodera marioni), was first identified in the Klamath Basin in 1923 on potatoes originating from stock from another State. Since then the eelworm has been found on some other farms resulting in heavy losses to a limited number of growers. In 1936 an intensive survey was made and funds were provided by the Oregon Legislature to develop practical control methods.

The survey showed that on certain farms, while abundant root-knot on weeds and crop plants indicated heavy soil infestation, yet potato crops were being harvested showing few or no nematode symptoms on the tubers. At the same time other fields apparently no more heavily infested were sustaining rather heavy tuber attack. The heaviest infestation was normally on the ridges or higher areas. In 1938, soil temperature readings started in mid-August showed rather wide differences on farms in the same district having similar soil but different irrigation practices. In fields irrigated every 3 to 5 days the average daily soil temperature was around 63° to 65°F. Fields irrigated at intervals of 7 to 9 days showed temperatures as high as 80°. Low temperature fields showed no external tuber symptoms at digging time although the roots of weeds and of potatoes indicated a heavy, general nematode population. A high-temperature field produced tubers 19 percent of which showed external symptoms.

These facts suggested an experiment, conducted in 1939, in a field that appeared to have a heavy and somewhat uniform nematode infestation. Irrigation of the different plots was conducted, after the first week, at intervals of 1, 2, 3, 4, and 5 days. Temperature readings were made each day at about 10:00 a.m. at 6-inch depth in the rows. The plot averages were 64.8°, 65.3°, 66.0°, 66.5°, and 67.5°, respectively. Irrigation started July 7, ended August 23. The water applied averaged 73°, coming from a canal about half a mile away where the water averaged 65°. The tubers were dug October 18. The percentage of tubers showing external eelworm symptoms was 48.6, 46.6, 33.4, 51.6, and 52.4, respectively. While the results demonstrated that soil temperature can be lowered through evaporation of irrigation water from the surface, the slight reduction in visible tuber symptoms apparently achieved by irrigation control in this test indicates the need for improved technique.

CONTROL OF ROOT KNOT IN FLORIDA CIGAR-WRAPPER TOBACCO FIELDS. Randall R. Kincaid, North Florida Experiment Station, Quincy, Florida.—An experiment was begun at Quincy, Florida, in the fall of 1937 on 1 acre of shade field where 15 consecutive crops of cigar-wrapper tobacco had been grown. The soil was heavily infested with root-knot nematodes. Treatments were in quadruplicate plots having a net area of about 1/35 acre each. Crops of tobacco were grown each year, and harvested, cured, sweated, and graded according to usual commercial practices. All plots were plowed in January and treated alike until the end of the crop season in July. The first series were kept in clean fallow by frequent plowing from July until January. In the second series the tobacco roots were removed from the field and the soil kept in clean fallow. In the third series clean fallow was followed by a cover crop of oats from October to January. All three produced good crops in both seasons with no significant differences. The fourth series in which unsuccessful attempt was made to grow sorghum in rows from July to November, followed by fallow, showed a significant increase in root knot and a reduction in yield. The fifth series, where native vegetation, mostly grasses, grew from July to January, showed a further small reduction in yield due to an adverse effect of the cover crop of native grasses, rather than an increase in nematode population. The tobacco grade index for the 5 treatments was practically the same.

COMPARISON OF CROP ROTATION AND FALLOWING AS METHODS OF CONTROL FOR ROOT KNOT OF COTTON UNDER IRRIGATION. C. J. King, U. S. Department of Agriculture, Sacaton, Arizona.—A cotton-alfalfa rotation practiced for 20 years on an area affected by root-knot nematodes indicated that satisfactory yields of American-Egyptian cotton could be maintained under conditions of the experiment, if the intervals between alfalfa were not greater than 2 years. It appeared that high yields of upland cotton could be maintained for several years without return of the area to alfalfa. The practice of clean fallowing combined with deep tillage in summer for 3 years was found effective in eliminating nematodes as a damaging factor to American-Egyptian cotton for one year and no serious damage resulted the second year although some of the area had been reinfested.

One year of alfalfa showed advantages over one year of fallow in improving production of American-Egyptian cotton in an area heavily infested with root-knot nematodes.

On the basis of the information obtained in these experiments, alfalfa rotation would appear to be equally as effective as and much more profitable than fallowing as a practical method for the control of root-knot nematodes affecting cotton.

THE RENIFORM NEMATODE AS A ROOT PARASITE. M. B. Linford, Juliette M. Oliveira, and Francis Yap, University of Hawaii, Honolulu, T. H.—A nematode, <u>Rotylenchulus reniformis</u> Linford and Oliveira 1940, that necessitates erection of a new genus of the Tylenchidae, occurs on Oahu, Territory of Hawaii, as a mildly pathogenic parasite of roots. Over 60 known host species represent 29 families of plants. Injuries include minute cortical lesions and mild hypertrophy in the stele. Larvae of typical eelworm shape develop in the soil, without feeding, into mature nonfeeding males and invasive young females, both resembling larvae in size and shape. Females penetrate intracellularly into the cortex of roots, coming to rest with the feeding stylet inserted into an endodermal cell. This cell and nearby pericycle parenchyma enlarge and become densely protoplasmic. The posterior part of the female, usually on the root surface, enlarges to become reniform, then eggs are laid in a gelatinous matrix, forming a mass that covers the reniform body and adheres to root and soil. In naturally infested soil, of a moisture content near the wilting percentage for plants, the reniform nematodes exceeded 50 percent survival during 36 weeks. In soil air-dried 33 weeks, with moisture dropping to 1/5 of the wilting percentage, there was more than 5 percent survival. This nematode appears less tolerant to freezing in soil than does the root-knot nematode. (From Phytopath. 30: 15)

A COMPARISON OF THE ROOT-KNOT NEMATODE AND THE MEADOW NEMATODE. C. W McBeth, U. S. Department of Agriculture, Tifton, Georgia.--The root-knot and meadow nematode may be confused in the larval stage, especially where they are stained within the plant tissue. The main distinguishing characteristic are as follows:

1. The meadow nematode larva is considerably more chunky than that o the root-knot nematode. 2. The lip region of the meadow nematode is more heavily cuticularized. 3. The spear or stylet of the meadow nematode is much heavier with more prominent basal swellings. 4. The tail is blunt or rounded in the meadow, and rather pointed in the root-knot nematode. These differences are very easily seen under the high power microscope but are rather obscure under the dissecting microscope, especially when the nematode are embedded in the plant tissue.

Probably the easiest way to distinguish the two within the plant tissue is by body width, shape of tail, and arrangement or position in the root. The root-knot larvae are, as a rule, found near the root tip, the body outstretched with the head end embedded in the central cylinder and pointing toward the plant. The meadow nematodes are always found in the cortex, some outstretched and otherscurled. Frequently the stylet can be seen in the meadow nematode, but not always.

After the nematodes become mature, there is no resemblance between the two, the meadow nematode retains the worm-like form while the root-knot nematode becomes pear shaped.

A lantern slide demonstration was given to illustrate the possibilit of confusing the two.

RECENT ROOT KNOT DAMAGE IN POTATOES. John T. Middleton, Citrus Experiment Station, Riverside, California.— Potatoes harvested from a 40-acre field in Southern California were severely infested with nematodes. About 40 percent of the crop was lost on this score alone. In an adjoining field of 10 acres, there was very little nematode infestation, less than 1 percent. Neither field had ever produced potatoes prior to this time. The 40-acre block had been in peaches the year before. The peaches, which were affected with nematodes, had been cut down and pulled out and the ground fallowed prior to planting the potato crop. The 10-acre block had been under cultivation for about 8 years, having produced only grain crops.

A 20-acre block of potatoes which yielded only 80 hundred pound sacks to the acre as compared with an average of 150 per acre was found severely infested with nematodes, about 80 to 90 percent. This same block had been in potatoes for the past 3 years. Each year the infestation has become progressively worse. If proper cultural practices had been employed the excessive losses could have been appreciably reduced. In general, nematode infestation of potatoes is more pronounced and causes greater damage to the fall crop (July-September).

THE EFFECT OF CROP ROTATION ON THE CONTROL OF HETERODERA MARIONI ON NORFOLK SANDY LOAM SOIL. K. J. Shaw, U. S. Department of Agriculture, Raleigh, North Carolina.— On an area of land known to be heavily infested with Heterodera marioni rotation experiments have been conducted during the past three years. Two types of plots are used: (1) Inclosure units, 12 by 24 feet, and (2) Field plots, 1/20 acre.

(1) Inclosure Units: Tobacco following velvet beans, bare fallow, oats and bare fallow and Crotolaria spectabilis showed less than 10 percent severe root knot. Tobacco following peanuts showed 14 percent; Soybeans (Laredo) 69.8; weeds (with crabgrass) 75.8; oats and weeds 77.5; and corn, cotton, sweet potatoes, and tobacco 100 percent severe root knot. Tobacco following 2 years' bare fallow showed no severe root knot, following 2 years' herdsgrass (Red top) 8.3; 2 years' lespedeza (Tennessee 76) 83.7; and tobacco 100 percent severe root knot.

(2) Field Plots: Based on 2-year averages, tobacco following peanuts showed 11 percent severe root knot, weeds 35.5, oats and weeds 43.5, cotton 44.3, corn 67.3, and tobacco 93.3 percent.

In the 3-year rotations, based on one year's results, cotton-peanuts-tobacco, peanuts-oats and weeds-tobacco and weeds-weeds-tobacco showed less than 10 percent severe root knot. Peanuts-cotton-tobacco and corn-oats and weeds-tobacco showed less than 25 percent. Corn-cotton-tobacco showed 28 percent, cotton-weeds-tobacco 45 percent, and continuous tobacco 93 percent. Data were also obtained on yield and value per acre but these do not necessarily correspond to the amount of severe root knot.

RECENT FIELD OBSERVATIONS ON TOMATO AND COTTON ROOT-KNOT NEMATODES. C. D. Sherbakoff, Tennessee Experiment Station, Knoxville, Tennessee.—Last year, in a paper before the Southern Division of the American Phytopathological Society, the author reported that in 1938 no root knot was found on any plant of a number of cotton varieties, selections and crosses, grown on a plot at Knoxville, Tennessee, where tomato plants grown the preceding year were all severely affected with root knot. In the same paper it was reported that some root knot was found on cotton in a field near Tiptonville, Tennessee, where no tomato had been grown, but cotton had been grown continuously for a number of years and where even Fusarium wilt-resistant varieties were severely affected, apparently with the wilt and meadow-nematode combination.

In 1939 more than 200 tomato plants of different varieties and selections were grown on the plot at Knoxville, and over 300 in the field near Tiptonville. At the end of the tomato season of 1939, all tomato plants in the plot at Knoxville were free from root knot, while in the field near Tiptonville they were severely affected.

THE DISTRIBUTION AND RELATION OF THE MEADOW NEMATODE, PRATYLENCHUS PRATENSIS, TO FUSARIUM WILT OF COTTON IN GEORGIA. A. L. Smith, U. S. Department of Agriculture, Experiment Georgia.—The widespread distribution of the meadow nematode in wilt soils both in the Piedmont and Coastal Plain suggests its probable important relationship to Fusarium wilt of cotton. This nematode was the predominant species in several fields in which ordinarily wilt-resistant varieties showed considerable wilting. A complete killing of all plants by wilt in other limited areas in fields of susceptible and semi-resistant varieties was likewise attributed to the heavy meadow nematode population. A detailed study of nematode population in a heavily wilt-infested field of Stoneville 2B cotton near Cuthbert showed the meadow nematode to be the predominant species. However, a significant correlation was not established between the number of meadow nematodes and the wilt infection in different parts of the field. A rather heavy infestation of a reniform nematode parasitic on cotton, Rotylenchulus reniformis Linford and Oliveira, 1940, (Described in Proc. Helm. Soc. Wash. 7 (1): 35-42) was also present. The root knot nematode, Heterodera marioni, was found relatively infrequently in the Cuthbert field.

ON THE OCCURRENCE OF THE BANANA NEMATODE (PRATYLENCHUS MUSICOLA [COBB] FILIPJEV) IN THE UNITED STATES. G. Steiner, U. S. Department of Agriculture, Washington, D. C.—Heavy infestations of the banana nematode, a close relative of the meadow nematode, have been found on roots of fig, olive and black walnut received from southern California. Black lesions develop until the root cortex is destroyed; the healthy distal roots of fig may even be amputated by destruction of the axial cylinder. This nematode has recently been found also killing boxwood plants in Virginia.

THE ROOT-KNOT NEMATODE ATTACKING STEMS AND LEAVES OF PLANTS. G. Steiner, U. S. Department of Agriculture, Washington, D. C.—Large numbers of root-knot larvae were observed entering the cotyledons, stems, and leaves of beans germinating in heavily infested soil. Many of the young plants were killed by this extreme infestation before the nematodes could multiply and thus acted as a trap crop; the next planting of beans showed only slight infestation.

SOME FURTHER OBSERVATIONS ON THE NEMATODE FUSARIUM-WILT EXPERIMENTS AT LUMBERTON, NORTH CAROLINA. A. L. Taylor, H. D. Barker, and P. H. Kime, U. S. Department of Agriculture.—In 1939 the set-up was similar to that of 1938 reported on at the New Orleans Meeting. (Phytopath. 29: 752) The results for 1939 were not materially different. The carbon-bisulfide treatment controlled disease sufficiently to enable the various wilt-resistant and wilt-tolerant varieties of cotton to become established and make a satisfactory growth. Only a moderate amount of wilt developed in the treated plots. In the untreated plots few plants had not been killed by the middle of July. Sea Island was the only variety that stood up in the untreated plots. It was not killed, but was severely stunted. Root knot was abundant and a great many secondary roots had been killed by the meadow nematode. It is encouraging that Sea Island was able to live and to send out new secondary rootlets, although it made poor growth.

There was no conclusive evidence for varietal differences with respect to resistance either to the root-knot nematode or the meadow nematode. It is true that Sea Island survived and there was a slight indication that the more wilt-resistant varieties such as Coker's 4 in 1 and Cook 307 were able to survive somewhat longer than were the less resistant varieties such as Delta Pine 12, Mexican Big Boll, and Miller. It was felt that these differences were due to wilt resistance characteristics rather than to nematode resistance, although the marked differences between carbon-bisulfide treated and untreated plots suggested that abundance of nematodes influenced infection by the wilt organism. Sea Island thus has some characteristic which even the most wilt-resistant uplands do not possess. Hence further experiments with Sea Island-upland hybrids and backcrosses may be profitable for producing a combination of wilt and nematode resistance.

NEMATODE POPULATION AND SPECIES DETERMINATION STUDIES ON SOILS FROM THE REGIONAL COTTON WILT PLOTS. A. L. Taylor, U. S. Department of Agriculture, Tifton, Georgia, and A. L. Smith, Georgia Experiment Station, Experiment Georgia.—Soil samples from the 12 regional wilt plots, furnished by the members of the Fusarium Wilt Committee in 8 States, were examined for the presence of the meadow nematode *Pratylenchus pratensis*. Large populations of this species were found in the samples from Allendale, Orangeburg, and Florence, South Carolina, Reidsville, Georgia, and Jacksonville, Texas. A few nematodes of this species were found in the samples from Moundville, Alabama, Hamlet, North Carolina, Tiptonville, Tennessee, and Marianna, Arkansas. No *P. pratensis* was found in the samples from Alexandria, Alabama, Tribbett, Mississippi, or Martin, Tennessee. There was no correlation betwee[n] *P. pratensis* in the samples and 3-year average midseason wilt percentages.

SUGGESTIONS ARISING FROM AN ANALYSIS OF "PLANTS REPORTED RESISTANT OR TOLERANT TOWARD ROOT-KNOT-NEMATODE INFESTATION". Jocelyn Tyler, U. S. Department of Agriculture, Washington, D. C.--In assembling data for a compilation now in press, on the above subject, there was found a surprising dearth of accurate first-hand information on certain plants. Careful field records are needed on the degree of infestation or resistance to root-knot found in specific grasses and other plants commonly considered resistant, and in other plants which might possibly be found resistant or tolerant. Gross symptoms, either above the ground or below, are not always dependable evidence. A proposed outline for reports is presented as follows:

OUTLINE FOR REPORTS ON ROOT-KNOT INFESTATIONS WITH PARTICULAR REFERENCE TO THE RESISTANCE OF CERTAIN PLANTS

Source of Information
Name of observer
Station or affiliation
Year of observation; of report

Plants Observed
Plant species
Crop variety
Species and variety of rootstock
Species and variety of scion
Season of observation
Length of growth period, to time of observation
Geographical location of planting
Field or greenhouse planting?

Direct Observations
Were roots examined?
How many roots?
In field or laboratory?
Description of root infestation:
- Look for very slight swellings
- How numerous?
- Are egg masses found? (Sometimes external, on very slight swellings.)
- Are egg masses large? Numerous?
- Largest galls: Size and abundance? External egg masses?

Any plants not infested?
What percentage of the planting?
Were these plants possibly growing in "no-nematode" spots?

Percentage of plants lightly infested
Describe infestation on these plants, as above
Any injury to plant growth?
Any loss in crop yeild?

Percentage of plants more heavily infested
Amount of infestation
Amount of injury
Amount of loss

Effect of a light infestation on young plants; on older plants
Effect of a heavy infestation on young plants; on older plants

Information Needed for Interpreting Observations
Soil type
Last crop
How heavily was it infested?
What weeds?
When were old roots plowed up?
Were they removed or left in the ground?
Plants previously grown on plot?
Any evidence of uneven distribution of root-knot in the plot?
Any evidence of uniform distribution of root-knot in the plot?

NEMATODE STUDIES AT U. S. REGIONAL VEGETABLE BREEDING LABORATORY. B. L. Wade, U. S. Department of Agriculture, Charleston, South Carolina.— Under field conditions at Charleston we have rarely had difficulties with nematodes, but in the greenhouse they present a problem every year. Once under field conditions we had a severe nematode attack on tomato varieties, but not on any other crops. Whenever infestation occurs we look for variety or strain differences in the crops involved.

At the present time we have crosses with Alabama No. 1 pole bean to attempt to incorporate its nematode resistance with bacterial blight and mosaic resistances of other beans now being worked with.

We plan to extend our studies somewhat to include identification of the nematodes involved and to include some controlled studies of varietal reactions of the vegetables included on our breeding program (except corn, which appears immune).

We will not have much money to devote to this work but we do have adequate greenhouse, laboratory, and office facilities available so that work could be done here by any division wishing to do fundamental or control work with nematodes.

CHEMICAL TREATMENT OF SOIL TO CONTROL THE ROOT KNOT NEMATODE. P. A. Young, Texas Agricultural Experiment Station, Jacksonville, Texas.--Several chemicals were tested to determine their value in controlling Heterodera marioni in sandy soil. Extensive tests showed that chloropicrin injected into the soil at rates of 300 to 600 pounds per acre usually controlled 90 to 100 percent of the root-knot nematodes. Likewise, injection of 1000 to 3000 pounds of carbon bisulfide per acre controlled all or most of the root-knot nematodes in numerous tests. These two chemicals controlled the nematodes efficiently only when the soil was covered during 4 or more days with paper coated with animal glue, casein, or vegetable paste. Comparative test showed that wetting the top 2 to 3 inches of soil with water immediately aft injecting these chemicals confined the chemicals in the soil so well that th water cover was nearly as efficient as the glue-coated paper in retaining th chloropicrin gas. Fumigating soil with chloropicrin at the rate of 10 c.c. per cubic foot of soil controlled soil-borne parasites. Formaldehyde, cyanamid, and sodium hydroxide were not effective in decreasing the abundance of nematodes in the soil. In the control of nematodes, watermelons were used as test plants in the treated and untreated soil to ascertain the effectiveness of the treatment. Usually 75 to 100 percent of the watermelon plants had root-knots when grown in the untreated (check) soil. Evidence was secu that the pocket gopher carried root-knot nematodes from untreated soil into disinfected soil of a hotbed. (Technical Paper 585)

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SOME RECENT RECORDS OF PLANT PATHOGENS IN MISSOURI

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SOME RECENT RECORDS OF PLANT PATHOGENS IN MISSOURI

By W. E. Maneval, Department of Botany, University of Missouri.

Plant Disease Reporter
Supplement 125 November 15, 1940.

In 1937 the writer published a rather extensive list (23) of Missouri fungi. Since then numerous new records of plant pathogens on wild and cultivated hosts have accumulated, most of them based on collections made during the last three years. Nearly half of these fungi apparently have never been reported for Missouri, and most of the others are new host records, so it seems desirable to publish the following list.

In this list an asterisk before the name of a species indicates, so far as the writer knows, a new record for the State, while nearly all other entries are for new hosts. Most of the names of hosts are those used in Gray's New Manual of Botany, 1908. After the names of hosts the place of collection, names of collectors and dates are given. The numbers in parentheses after the names of the fungi refer to the bibliography at the end of the list, showing where descriptions of the various species may be found. Brief notes have been added in some places. Several of the fungi were found on specimens in the phanerogamic herbarium of the University of Missouri. This is shown by giving the numbers of the sheets from which the fungi were taken. Identification of hosts was done almost entirely by the writer, and of the fungi mainly by him; however, much valuable aid in determining the fungi was received from C. M. Tucker, George B. Cummins, Charles Chupp, George L. Zundel, Anna E. Jenkins, H. H. Whetzel, John T. Middleton and others.

Alternaria brassicae (Berk.) Sacc. var. nigrescens Pegl. (31)
On Citrullus vulgaris Schrad. Southeastern Missouri: J. W. C. Anderson, 1939.

Alternaria solani (Ell. & Mart.) Jones & Grout (17, 28)
On Lycopersicon pimpinellifolium Mill. Columbia: Tucker, 1939.

*Bacterium papavericola Bryan and McWhorter (5)
On Papaver orientale L. Jefferson City: Tucker, 1937.

Bacterium tumefaciens Smith & Townsend (11)
On Cucumis sativus L. Columbia: Tucker, 1939. In a greenhouse at the University of Missouri.

*Badhamia utricularis (Bull.) Berk. (22)
On Juncus tenuis Willd. Columbia: T. E. Birkett, 1939.
On Trifolium repens L. Neosho: Frank Darnell, 1938. Determined by J. B. Routien.

Botrytis cinerea Pers. (31)
On Paeonia (cult.) Sarcoxie: Wild Brothers Nursery, 1937.

*Cercospora acetosellae Ell. (12)
On Rumex acetosella L. Columbia: Maneval, 1939.

*Cercospora alismatis Ell. & Holw. (12)
On Alisma plantago-aquatica L. Joplin: Charles Thom, 1900. From herbarium specimen 216.

Cercospora althaeina Sacc. (12)
On Malva rotundifolia L. Columbia: Maneval, 1937.

*Cercospora (Cercosporina) cannabis Hara (17a)
On Cannabis sativa L. Weston: Barton L. Poss, 1938. Determination by Charles Chupp who says that, according to his data, this is the first record of this species in the United States.

Cercospora cruciferarum Ell. & Ev. (14)
On Radicula palustris (L.) Moench. Columbia: Maneval, 1938. This fungus was collected by Galloway on Raphanus sativus in Missouri in 1887 (14).

*Cercospora dolichi Ell. & Ev. (14a, 31, 35)
On Vigna sinensis (L.) Endl. Columbia: Maneval, 1931. Determined by Charles Chupp. Previously reported (23) as Cercospora cruenta.

Cercospora dubia (H. Riess) Wint. (31)
On Chenopodium hybridum L. Columbia: Maneval, 1935.

*Cercospora hanseni Ell. & Ev. (29, vol. 11: 629)
On Asclepias syriaca L. Cedar Creek east of Columbia: Maneval, 1917. Determination by Charles Chupp. Previously reported (23) as Cercospora clavata.

Cercospora helianthi Ell. & Ev. (14)
On Helianthus sp. Columbia: J. E. McClary, 1938. Previously reported (14) for Missouri but this is our first collection.

Cercospora plantaginis Sacc. (12, 35)
On Plantago rugellii Dcne. Columbia: Maneval, 1939.

*Cercospora platanicola Ell. & Ev. (14, 47)
On Platanus occidentalis L. Columbia: Maneval, 1924.

*Cercospora polygonacea Ell. & Ev. (12)
On Polygonum ramosissimum Michx. Columbia: Chris G. Schmitt, 1937.

*Cercospora populina Ell. & Ev. (14)
On Populus deltoides Marsh. Elsberry: Chris G. Schmitt, 1935. Determination by Charles Chupp.

Cercospora resedae Fckl. (12, 31)
On Reseda odorata L. Columbia: Maneval, 1923. This species was omitted in the list (23) published in 1937.

*Cercospora ribis Earle (29, vol. 11: 625)
On Ribes (cult. currant). Columbia: Maneval, 1931. Determination by Charles Chupp. Previously reported (23) as Cercospora angulata.

*Cercospora sagittariae Ell. & Kell. (13)
On Sagittaria latifolia Willd. Columbia: Maneval, 1939.

Cercospora viridula Ell. & Ev. (14a)
On Ipomoea coccinea L. McBaine: Maneval, 1917. Previously reported (14a) on Ipomoea purpurea for Missouri, but this is our first collection.

Claviceps purpurea (Fr.) Tul. (32)
On Agropyron repens (L.) Beauv. Milan, 1939. This specimen was received at the seed testing laboratory in the Missouri College of Agriculture and the host was identified by Miss Clara Fuhr.
On Agrostis alba L. Laddonia; Mrs. Milton Pohlman, 1937.
On Dactylis glomerata L. Columbia: Maneval, 1939.
On Diarrhena diandra (Michx.) Wood. Columbia: Maneval, 1938.
On Festuca glauca Lam. (F. ovina var. glauca (Lam.) Koch). Centralia: C. L. Lefebvre, 1938. This host is not a native grass, but was planted along borders in the cork garden of A. B. Chance. It was identified by Mrs. Agnes Chase.
On Triticum vulgare Vill. Columbia: Maneval, 1939.

Coleosporium solidaginis (Schw.) Thüm. (1)
On Pinus echinata Mill. Montauk Park: L. Jeffrey, 1933. Determination by George B. Cummins.

Colletotrichum cereale Manns (31, 45)
On Echinochloa muricata (Michx.) Fernald. Foil: F. E. Rippe, 1920. From herbarium specimen 9194.

*Cylindrosporium clematidis Ell. & Ev. (14)
On Clematis virginiana L. Shut-ins on the east fork of Black River: Chris G. Schmitt, 1938.

Darluca filum (Biv.) Cast. (31)
On Melampsora abieti-capraearum Tub. on Salix sp. Columbia: Hudson Hartman, 1939.

Didymellina iridis (Desm.) Höhn. (31, 38)
On Belamcanda chinensis (L.) DC. Columbia: Maneval, 1938.

Empusa grylli (Fres.) Nowak (29, vol. 7: 282)
On Melanoplus bivittatus Say. Near Camdenton: George D. Jones, 1938.
On Melanoplus mexicanus. Near Camdenton: George D. Jones, 1938. Many grasshoppers, mostly M. bivittatus, were killed by the fungus. In one place the dead insects were found over an area of 60 acres. The first dead ones were found about the middle of June.
On Melanoplus differentialis Thomas. Reported by George D. Jones from several localities in Camden, Davies, Harrison, Mercer, Ray, and Ste. Genevieve Counties, 1938.

*Entyloma australe Speg. (7)
On Physalis missouriensis Mack. & Bush. Columbia: Maneval, 1937. This smut has recently been reported also on Physalis pubescens L. in Missouri (50).

Entyloma linariae var. veronicae Wint. (7)
On Veronica peregrina L. Columbia and Rocheport: K. W. Simons, 1937. This is our only collection of this smut. It was first recorded by Winter and Demetrio (46) for Perryville, Missouri, the type locality.

Erysiphe graminis DC. (30)
On Triticum vulgare Vill. Buchanan County: Roscoe V. Hill, 1938. Previously reported for the State on this host but this is our first collection. Specimens from farm of Arthur Fragge and many fields reported infected.

Erysiphe polygoni DC. (30)
On Lathyrus latifolius L. (Perennial Pea) Columbia: Maneval, 1938. Perithecia and ascospores abundant. No mildew is listed for this host by Salmon (30) nor Seymour (34).

Erysiphe polygoni DC. (30) (continued)

On Lycium halimifolium Mill. Columbia: Maneval, 1938. No perithecia were found so the identity of the mildew is uncertain as Sphaerotheca pannosa also occurs on this host.

On Polygonum ramosissimum Michx. Columbia: Chris G. Schmitt, 1937.

On Trifolium repens L. Columbia: Maneval, 1937.

*Fusarium heterosporium Nees (48)

On Claviceps purpurea on Poa compressa L. Columbia: Edgar Sundermeyer, 1939. Determination by C. L. Lefebvre.

Fusarium oxysporum (Schl.) var. gladioli Massey (48)

On Gladiolus corms causing a storage rot. St. Louis: L. Jeffrey, 1938.

Gymnosporangium clavipes Cke. & Pk. (1)

On Crataegus crus-galli L. Columbia: L. Haseman, 1937. This rust occurs on several species of Crataegus in and around Columbia.

On Cydonia oblonga Mill. Columbia: L. Haseman, 1937; Turner's Station, 1937; Mountain Grove: M. A. Smith, 1939.

On Pyrus communis L. Columbia: Maneval, 1937. Not given on this host in Arthur's Manual (1), but identification verified by George B. Cummins.

On Pyrus malus L. Columbia: H. G. Swartwout, 1937.

Gymnosporangium globosum Farl. (1)

On Crataegus oxyacantha L. Columbia: Maneval, 1939. This host is not listed by Arthur (1) nor Seymour (34) but the identification seems positively correct. During 1939 the infections of Crataegus spp. by this rust in central Missouri were the heaviest that I have ever seen. On many trees practically all of the leaves were infected, and on some of them all were killed by midsummer.

On Pyrus communis L. Springfield: M. A. Smith, 1936; Columbia: Maneval, 1937.

Gymnosporangium juniperi-virginianae Schw. (1)

On Pyrus lancifolia (Rehd.) Bailey. Columbia: Maneval, 1939.

*Hysterium pulicare Pers. ex. Fr. (3, 15)

On Betula nigra L. Meramec State Park: John M. Mason, 1938.

Melampsora abieti-capraearum Tub. (1)

On Salix wardii Bebb. Shut-ins: Chris G. Schmitt, 1938.

*Melampsora euphorbiae-gerardianae W. Müll. (1)

On Euphorbia commutata Engelm. Meramec State Park: John M. Mason, 1938. Arthur (1) lists this rust as occurring in northern Indiana and eastern West Virginia in this country.

Microsphaera diffusa Cke. & Pk. (30)
On Lespedeza striata (Thunb.) Hook. & Arn. Columbia: Edward Weaver, 1938. In an earlier list (23) the identity of this mildew was indicated as doubtful; but in this collection perithecia and ascospores were present so the identification is certain.

Peronospora lepidii (McAlp.) Wils. (31,44)
On Capsella bursa-pastoris (L.) Medic. Columbia: Maneval, 1937.
Cardamine parviflora L. var. arenicola (Britt.) O. E. Schulz. Osage Beach, Lake of the Ozarks: John T. Middleton, 1937.
On Sisymbrium canescens var. brachycarpon (Richards) Watson Columbia: Maneval, 1937. This mildew and also P. parasitica were unusually abundant at Columbia in May, 1937, on the hosts named and also on Lepidium spp.

Phyllachora graminis (Pers.) Fckl. (6)
On Muhlenbergia mexicana (L.) Trin. Webb City: E. J. Palmer, 1927. On herbarium specimen 32734.
On Panicum virgatum L. Columbia: H. W. Rickett, 1935; Shut-ins: Chris G. Schmitt, 1938.

Phyllactinia corylea (Pers.) Karst. (30)
On Quercus palustris Muench. St. Louis: J. A. Henning, 1939.

Phyllosticta melaleuca Ell. & Ev. (33)
On Ulmus americana L. Columbia: Maneval, 1937.

Phyllosticta phomiformis Sacc. (24, 33)
On Quercus muhlenbergii Engel. Columbia: Jasper A. Clark, 1937 Previously reported (33) for Missouri, but this is our first collection at Columbia.

*Phyllosticta verbenicola Martin (24)
On Verbena hastata L. Columbia: Maneval

Phytophthora cactorum (Leb. & Cohn) Schroet. (40, 41)
On Paeonia (cult.) Columbia: Tucker, 1937, 1939. This fungus was reported by Crandall & Hartley (8) as associated with seedling diseases of Caragana, Nyssa, and Colutea in a forest nursery at Elsberry, and presumably also on Acer, Cornus, Ostrya, Prunus, and Robinia in the surrounding area.

Phytophthora sp.
On Antirrhinum majus L. Jefferson City: Tucker, 1938
On Iris (cult.) Columbia: Tucker, 1937.
On Lilium regale Wils. Columbia: Tucker, 1936.
On Tulipa (cult.) Columbia: Tucker, 1936.
These are the first reports for Missouri of Phytophthora parasitizing the last three hosts named.

Puccinia extensicola oenotherae (Mont.) Arth. (1)
On Oenothera laciniata Hill. Roscoe: Francis Drouet, 1932; Columbia: Maneval, 1938.

Puccinia graminis Pers. (1)
On Elymus canadensis var. glaucifolius (Muhl.) Gray. Columbia: Maneval.
On Hordeum jubatum L. Kirksville: Chris G. Schmitt, 1937. Determination by George B. Cummins.

Puccinia impatientis (Schw.) Arth. (1)
Elymus virginicus L. Columbia: Maneval. Our first collection but previously reported (1) for Missouri.

*Puccinia phragmitis (Schum.) Körn. (1)
On Phragmites communis Trin. Fulton: Cecil Davis, 1937.

*Puccinia physostegiae Pk. & Cke. (1)
On Physostegia virginiana (L.) Benth. Fulton: L. Jeffrey, 1937. This rust is recorded in Arthur's Manual (1) for Indiana and New York.

Puccinia polygoni-amphibii Pers. (1)
On Geranium carolinianum L. McBaine: Maneval, 1917. This is This is the only record that I have found for this rust on G. carolinianum. Arthur (1) does not list it for this host.

*Puccinia proserpinacea (Berk. & Curt.) Farl. (1)
On Proserpinaca palustris L. Dunklin County: B.F. Bush, 1892. From herbarium specimen 8430.

*Puccinia tumidipes Pk. (1)
On Lycium halimifolium Mill. Ridgeway: Tucker, 1939; Columbia: Clara Fuhr, 1939.

Pythium arrhenomanes Drechsler (21, 26)
On Triticum vulgare Vill. Augusta Tucker, 1939; Determination by Chris G. Schmitt.

Pythium debaryanum Hesse (4, 26)
*Pythium splendens Braun (4, 26)
*Pythium ultimum Trow (39)
On Begonia sp. (fibrous rooted). Columbia: Tucker & Middleton, 1938. These three species of Pythium were all isolated and identified by John T. Middleton. They occurred on roots, crowns, stems and basal leaves of the host.

Rhizoctonia bataticola (Taub.) Butler (2, 37)
(Macrophomina phaseoli (Maubl.) Ashby)
On Gossypium hirsutum L. (seedlings). Missouri: Tucker, 1940.
On Lespedeza stipulacea Maxim. Columbia: Tucker, 1937.
On Phaseolus vulgaris L. Neosho: Tucker, 1933.
On Rheum rhaponticum L. (seedlings). Hermann: Tucker, 1937.

*Rhynchosporium secalis (Oud.) J.J.Davis (29)
On Hordeum vulgare L. Reported on barley at Columbia by A.G. Johnson, 1937 (P. D. Reporter 21: 242, 1937) and by Jesse E. Livingston as common at Elsberry in 1938. Johnson says his report seems to be the first for Missouri.

*Rhytisma (ilicis-canadensis Schw.?)
On Ilex verticillata (L.) Gray. Shut-ins: Chris G. Schmitt, 1938.

*Sclerotinia convoluta Drayton (10)
On Iris (cult.) Clayton: Tucker, 1939.

Sclerotinia libertiana Fckl. (49)
On Antirrhinum majus L. Kirkwood: Tucker, 1939.
On Daucus carota L. Columbia: Maneval, 1937.
On Paeonia (cult.) Sarcoxie: Tucker, 1937. Determination by H.H. Whetzel.

Sclerotium delphinii Welch (36)
On Calendula officinalis L. Columbia: Tucker, 1937.
On Dianthus hybridus. Columbia: Tucker, 1937.
On Hosta (caerulea ?) Kirksville: Tucker, 1937.
On Lilium candidum L. Kansas City: Tucker, 1939.
On Trifolium pratense L. Columbia: Tucker, 1938.
On Viola tricolor L. var. hortensis DC. University City: Tucker, 1937.
On Viola sp. Kansas City: Tucker, 1939.

Scolecotrichum graminis Fckl. (19)
On Hordeum jubatum L. Sumner: Kenneth Krumm, 1938.
On Phleum pratense L. Columbia: Maneval, 1939.

Septoria aceris (Lib.) Berk. & Br. (25)
On Acer saccharinum L. Columbia: N.B. Powell, 1938.
This host was omitted in the list (23) of fungi published in 1937.

Septoria acicola (Thüm.) Sacc. (18)
On Pinus nigra austriaca Schneid. Cedar City: J. Carl Dawson, 1939. This is our first collection of this fungus, but it had previously been reported for Missouri by George G. Hedgcock (18).

*Septoria chrysanthemi Halsted
On Chrysanthemum leucanthemum L. Columbia: Maneval, 1939. This material agrees with Seymour & Earle, Economic Gungi 301, on the label of which the species is described.

*Septoria conspicua Ell. & Mart. (25)
On Steironema ciliatum (L.) Raf. Cowgill: Ura M. Means, 1938.

*Septoria convolvuli Desm. (29, vol. 3: 536; 31)
On Convolvulus arvensis L. Oak Grove, 1938.

*Septoria (gaurina ?)
On Gaura biennis L. Burlington Junction; J. R. Singleton, 1939.

*Septoria littorea Sacc. (25)
On Apocynum cannabinum L. McBaine: Chris G. Schmitt, 1937.

Septoria nabali Berk. & Curt. (25, 31)
On Prenanthes altissima L. var. cinnamomea Fernald. Meramec State Park: John M. Mason, 1938.

Septoria oenotherae Westd. (25)
On Oenothera laciniata Hill. Grundy County: D. R. Crookshanks, 1937.

*Septoria passerinii Sacc. (43)
On Hordeum jubatum L. Sumner; Kenneth Krumm, 1938; Columbia: Maneval, 1938. This fungus agrees well with Weber's description (43).

*Septoria pentstemonis Ell. & Ev. (25)
On Pentstemon sp. Columbia: K. W. Simons, 1937.

*Septoria tecomae Ell. & Ev. (16)
On Tecoma radicans (L.) Juss. Columbia: Maneval, 1939.

*Stagonospora curtisii (Berk.) Sacc. (9)
On Narcissus (cult.) Cartersville: B. C. Auton, 1937.

*Taphrina carveri A.E.Jenkins (20)
On Acer saccharinum L. Lutesville: Linder Englehart, 1939. Determination by Anna E. Jenkins. Previously reported from Ontario, Alabama, and Michigan (20).

Taphrina ulmi (Fckl.) Joh. (27)
On Ulmus americana L. Columbia: Maneval, 1939.
On Ulmus fulva Michx. Columbia: L. Haseman, 1939.

*Urocystis kmetiana Mgn. (50)
On Viola rafinesquii Greene. Five miles east of Columbia (Lake of the Woods): Ilda McVeigh & K. W. Simons, 1937. Identification verified by George L. Zundel. This smut had previously been reported (7) for Arkansas and Tennessee.

Uromyces lespedezae-procumbentis (Schw.) Curt. (1)
On Lespedeza intermedia (Wats.) Britt. Reynolds County: J. A. Steyermark, 1935. On herbarium specimen 19764.

Uromyces peckianus Farl. (1)
On Plantago elongata Pursh. Sandstone Bluff, northeast of Columbia: Maneval, 1933. Apparently a new host for this rust, as it is not included in Arthur's Manual (1).

Uromyces plumbarius Pk. (1)
On Gaura biennis L. Zebra: Francis Drouet & R. E. Zirkle, 1928; Burlington Junction: J. R. Singleton, 1939.

*Ustilago spermophora Berk. & Curt. (7)
On Eragrostis megastachya (Koeler) Link. Columbia: Maneval, 1938.

Ustilago striaeformis (West.) Niessl. (7)
On Agropyron subsecundum (Link) Hitchc. Columbia (greenhouse): Chris G. Schmitt, 1937.
On Poa pratensis L. Columbia (greenhouse): J.D. Baldridge, 1939.

Venturia inaequalis (Cke.) Wint. (17, 42)
On Pyrus ioensis (Wood) Bailey. Eastville: G. W. Bohn and Francis Drouet, 1935, herbarium specimen 23769; Springfield: M. A. Smith, 1937; Bevier: Tucker, 1938.

Virus diseases
Aster yellows on Erigeron canadensis L. Versailles: Tucker, 1938.
*Streak on Nicotiana tabacum L. Camden Point, Glasgow, Keytesville, Weston, 1939. Determination by W. D. Valleau.

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THE REACTION OF SORGHUM VARIETIES AND HYBRIDS TO MILO DISEASE

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THE REACTION OF SORGHUM VARIETIES AND HYBRIDS TO MILO DISEASE[1]

L. E. Melchers, Head of Department of Botany, Kansas Agricultural Experiment Station and Alvin E. Lowe, Assistant Agronomist, Garden City Branch, Kansas Agricultural Experiment Station.

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Milo disease, also known as root, crown and shoot rot of milo and Pythium root rot of milo (1, 2) is of increasing economic importance in those states where it occurs. The symptoms, method of spread, and control have been described in the literature (1, 2, 3). This disease is spreading to new locations and over wide areas where milo and milo hybrids are extensively grown.

Investigators engaged in sorghum improvement should be interested in having a record of the known reaction of sorghum varieties, selections, and hybrid lines to the disease. Such information should be particularly valuable to sorghum breeders desiring to use resistant parental material in crosses.

For this reason the authors believe it is useful to publish a list of the available information on the reaction of sorghums to the milo disease. The accompanying list of varieties, selections, and hybrids are those which have actually been tested on infested soils in Kansas either in field or greenhouse sowings. It is possible that a few additional varieties or hybrids might be added to the list from sources other than Kansas, but the list is believed to be nearly complete without such additions. It contains all those sorghums which were originally tested at Garden City, Kansas, by Wagner (4), in addition to a large number which have been tested by the writers in recent years.

It has been learned since the publication of Wagner's paper (4), that no variety of sorghum is immune; therefore, Wagner's classification has not been followed. In the present paper the groups resistant, susceptible, and segregating are the terms used in the classification. The two latter terms need no explanation. The term "resistant," as herein used, means that a variety will produce a normal crop in infested soil and is definitely tolerant to the disease with no measurable injury to the grain or forage. When parts of the underground system of a resistant plant are examined, however, infected areas may be found. For this reason, such varieties have not been classified as immune.

All varieties classed as resistant have maintained their resistance over a period of years. Physiologic races of the organisms concerned so far have not changed the reaction of these varieties, although it is possible that in the future such a condition may arise.

1/ Contribution No. 403, Department of Botany, Kansas Agricultural Experiment Station, and No. 69 Office of Director, Kansas Agricultural Experiment Station.

When varieties, selections, or hybrids are planted in infested soils either in the field or in the greenhouse, the disease reaction is sharp and it is not difficult to place them properly into one of the three classes resistant, susceptible, or segregating.

It should be remembered that similar crosses or other strains of sorghum varieties which occur elsewhere upon testing may not have the same classifications as those indicated in this report. The observed reaction of only the varieties and strains that have been studied are given in this report.

It can be said in general that most of the milos and many of the milo and Darso hybrids are susceptible or segregating. There are a few exceptions such as Kalo, Early Kalo, Manko Maize, and some unnamed hybrids. This apparently is owing to chance selection of resistant lines by the agronomists responsible for the development of these varieties. Varieties of feterita, sorgo, kafir, Sudan grass, Durra, broomcorn, and other miscellaneous sorghums are resistant as shown in the accompanying list.

In addition to the listings above, several hundred individual resistant selections and strains of Sooner, Colby milo, darso, Pygmy milo, Day, Beaver, Wheatland and Dwarf Yellow milo are not included. Over a hundred selections and strains of sorghums from other experiment stations that have not been considered sufficiently important to be assigned identification numbers also are omitted from this report.

Table 1. Reaction of sorghums to milo disease, Garden City and Manhattan, Kansas, 1930-1939.

Variety	Accession Number (a) 2/	Source of seed
	Susceptible	
Backcross x Kalo	H.C. 391	Hays, Kansas
Beaver	C.I. 871	Woodward, Oklahoma
Blackhull kafir x Darso	S.A. 56-59-60	Chillicothe, Texas
Blackhull kafir x Darso	S.A. 61	Chillicothe, Texas
Blackhull kafir x Darso	S.A. 62	Chillicothe, Texas
Colby milo (Dwarf Yellow milo x Early White milo)	Colby 31	Colby Branch Experiment Station
Cream milo	K.B. 2569	Manhattan, Kansas
Custer Sel.	C.I. 919	Hays, Kansas
Darso	C.I. 615	Woodward, Oklahoma
Darso x Fargo	A-30-1	Goodwell, Oklahoma

2/ For explanation see end of table.

Variety	Accession Number	Source of seed
	Susceptible	
Dawn kafir x Darso	K.B. 37221	Manhattan, Kansas
Dawn kafir x Darso	Wdw. 52-23	Woodward, Oklahoma
Day milo	C.I. 959	Woodward, Oklahoma
Desert Bishop	C.I. 870	Lawton, Oklahoma
Double Dwarf Yellow milo	C.I. 868	Hays, Kansas
Durra x Dwarf Yellow milo	Wdw. 696x332	Woodward, Oklahoma
Dwarf Early Yellow milo	F.C. 8925	Manhattan, Kansas
Dwarf White milo	F.C. 8927	Manhattan, Kansas
Dwarf White milo x Blackhull kafir	La. 3268	Lawton, Oklahoma
Dwarf Yellow milo	C.I. 332	Garden City, Kansas
Dwarf Yellow milo	C.I. 2313	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-27	Manhattan, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 358	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 3310	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 3311	Hays, Kansas
Dwarf Yellow milo x Early White milo	Colby 10	Colby, Kansas
Dwarf Yellow milo x Early White milo	Colby 19	Colby, Kansas
Dwarf Yellow milo x Early White milo	Colby 29	Colby, Kansas
Dwarf Yellow milo x Early White milo	Colby 32	Colby, Kansas
Dwarf Yellow milo x Hegari	Wdw. 13-10	Woodward, Oklahoma
Dwarf Yellow milo x (Pink kafir x milo)	H.C. 311	Hays, Kansas
Early White milo	C.I. 480	Hays, Kansas
Early White milo x Dwarf Yellow milo	C.I. 962	Dalhart, Texas
Early Yellow milo	C.I. 868	Hays, Kansas
Early Yellow milo	T.S. 21195	Lubbock, Texas
Early Yellow milo No. 8	--------	Manhattan, Kansas
Extra Dwarf White milo	T.S. 13352	Lawton, Oklahoma
Extra Early Sumac sorgo	--------	Dalhart, Texas
Kafir x Dwarf Yellow milo	C.I. 897	Woodward, Oklahoma
Kafir x Dwarf Yellow milo	C.I. 898	Woodward, Oklahoma
Kafir x Dwarf Yellow milo	C.I. 960	Woodward, Oklahoma

Variety	Accession Number	Source of Seed
	Susceptible	
Kafir x Dwarf Yellow milo	C.I. 961	Woodward, Oklahoma
Kafir x Dwarf Yellow milo	Sel. 27317	Manhattan, Kansas
Kafir x Milo 36-1-1	C.I. 895	Woodward, Oklahoma
Kafir x Milo 26-4-1	C.I. 896	Woodward, Oklahoma
Kafir x Milo 338	Wdw. 26-4-1	Manhattan, Kansas
Kansas Orange x Dwarf Yellow milo	Sel. 29247	Manhattan, Kansas
(Milo x kafir) x milo	S.A. 40	Chillicothe, Texas
(Milo x kafir) x milo	S.A. 41	Chillicothe, Texas
Pygmy milo	C.I. 1010	Woodward, Oklahoma
Quadroon (Milo hybrid 5, T.S.22631)	F.C. 16181	Hays, Kansas
Sharon kafir x Darso	Sel. 31-14	Woodward, Oklahoma
Sharon kafir x Darso	La. 32-85	Lawton, Oklahoma
Sharon kafir x Darso	La. 32-185	Dalhart, Texas
Sharon kafir x Dwarf Yellow milo	Man. 307-4	Manhattan, Kansas
Sooner milo	C.I. 917	Woodward, Oklahoma
Standard White milo	C.I. 352	Manhattan, Kansas
Standard Yellow milo	C.I. 234	Manhattan, Kansas
Sudan corn	K.B. 31118	Manhattan, Kansas
Wheatland	C.I. 918	Woodward, Oklahoma
Wheatland Sel.	K.B. 36359	Manhattan, Kansas
Wheatland x Dwarf Yellow milo	Wdw. 1-2	Woodward, Oklahoma
White Darso	Sel. 30110	Manhattan, Kansas
White Darso	Ks. Sel. 33378	Woodward, Oklahoma
White Darso (Goodwell)	D-48B, 1938	Manhattan, Kansas
White Wheatland Sel.	1936 row 233-3	Manhattan, Kansas
	Segregating	
Custer	C.I. 919	Hays, Kansas
Dawn kafir x Wheatland	H.C. 386	Hays, Kansas
Dwarf Kalo	H.C. 313	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 337	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 344	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 346	Hays, Kansas

Variety	Accession Number	Sources of Seed
	Segregating	
Dwarf Yellow milo x Dwarf Freed	H.C. 347	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 3410	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 3411	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 3414	Hays, Kansas
Dwarf Yellow milo x kafir	C.I. 903	Hays, Kansas
Sharon kafir x Dwarf Yellow milo	Wdw. 813x332(F_2)	Woodward, Oklahoma
White Darso (Stillwater strain)	Haston's Sel.	Woodward, Oklahoma
	Resistant	
ACl Sorghum Sel.	C.I. 1106	Akron, Colorado
African millet x feterita	F.C. 9161	Hays, Kansas
Ajax	C.I. 968	Manhattan, Kansas
Atlas x Early Sumac	Hays 30-14	Manhattan, Kansas
Atlas x Early Sumac	F.C. 9165	Hays, Kansas
Atlas x Early Sumac	H.C. 381	Hays, Kansas
Atlas x Early Sumac	H.C. 382	Hays, Kansas
Atlas sorgo	C.I. 899	Manhattan, Kansas
Beaver Sel. (from G.C.C.31)	GC 38278	Garden City, Kansas
Bishop	C.I. 814	Woodward, Oklahoma
Blackhull kafir x Sumac	S.A. 119	Chillicothe, Texas
(Blackhull kafir x Sumac) x Sumac	S.A. 107	Chillicothe, Texas
(Blackhull kafir x Sumac) x Sumac	S.A. 108	Chillicothe, Texas
Black Spanish broomcorn	K.B. 30104	Manhattan, Kansas
Brown Durra	C.I. 935	Manhattan, Kansas
Cheyenne	F.C. 9170	Garden City, Kansas
Chiltex	C.I. 874	Woodward, Oklahoma
Chiltex x Hegari	S.A. 19	Chillicothe, Texas
(Chiltex x Hegari) x Chiltex	S.A. 85	Chillicothe, Texas
Club	C.I. 901	Hays, Kansas
Club Sel.	H.C. 331	Hays, Kansas
Club Sel.	H.C. 335	Hays, Kansas
Club Sel.	H.C. 3432	Hays, Kansas
Club Sel.	K.B. 33327	Manhattan, Kansas

Variety	Accession Number	Sources of Seed
	Resistant	
Club x Dwarf Freed	H.C. 3424	Hays, Kansas
Club x Dwarf Freed	H.C. 3426	Hays, Kansas
Club x Western Blackhull	H.C. 389	Hays, Kansas
Club x (Wheatland x milo)	H.C. 34442	Hays, Kansas
Club x (Wheatland x milo)	H.C. 34446	Hays, Kansas
Colby milo (b)	---------	Manhattan, Kansas
Custer Sel.	G.C. 301	Garden City, Kansas
Dakota Amber sorgo	S.D. 39-30-S	Brookings, South Dak
Darso Sel.	K.B. 39122	Manhattan, Kansas
Darso Sel.	K.B. 39123	Manhattan, Kansas
Darso Sel.	K.B. 39125	Manhattan, Kansas
Dawn kafir x Custer	H.C. 395	Hays, Kansas
Dawn kafir x Darso	Wdw. 52-26	Dalhart, Texas
Dawn kafir x Darso	Wdw. 52-29	Woodward, Oklahoma
Dawn kafir Sel.	C.I. 904	Hays, Kansas
Dawn kafir x (Kansas Orange x milo)	K.B. 33315	Manhattan, Kansas
Day milo Sel. (from G.C.301)	GC 38311	Garden City, Kansas
Day milo Sel.	K.B. 37234	Manhattan, Kansas
Day milo Sel.	K.B. 37235	Manhattan, Kansas
Day milo Sel.	K.B. 37236	Manhattan, Kansas
Day milo Sel.	K.B. 37237	Manhattan, Kansas
Day milo Sel.	K.B. 37238	Manhattan, Kansas
Double Dwarf Darlo	C.I. 1110	Davis, California
Double Dwarf milo No.1	---------	U.S.D.A. Washington,
Double Dwarf milo No. 2	---------	U.S.D.A. Washington
Double Dwarf milo No. 3	---------	U.S.D.A. Washington
Double Dwarf milo. No.4	---------	U.S.D.A. Washington
Double Dwarf milo No.5	---------	U.S.D.A. Washington
Dwarf Bishop	Wdw. 10-1-29	Woodward, Oklahoma
Dwarf Club	H.C. 334	Hays, Kansas
Dwarf Club	H.C. 380	Hays, Kansas
Dwarf feterita	Wdw. 182-867-2	Woodward, Oklahoma
Dwarf feterita	Wdw. 182-D. Fet.#3-11	Woodward, Oklahoma
Dwarf feterita	Wdw. 182-D. Fet.#3-13	Woodward, Oklahoma
Dwarf feterita	Wdw. 623-867-4	Woodward, Oklahoma
Dwarf feterita No. 6	C.I. 964	Woodward, Oklahoma
Dwarf feterita x Dwarf Freed	H.C. 336	Hays, Kansas
Dwarf feterita x (milo x kafir)	H.C. 312	Hays, Kansas
Dwarf Freed	C.I. 971	Hays, Kansas
Dwarf Hydro	1937 row 323-9	Manhattan, Kansas
Dwarf Hydro Sel.	38M416	Manhattan, Kansas

Variety	Accession Number	Sources of Seed
	Resistant	
Dwarf Hydro Sel.	38M421	Manhattan, Kansas
Dwarf kafir	Wdw. 5-12	Woodward, Oklahoma
Dwarf Kafir	Wdw. 24-43	Woodward, Oklahoma
Dwarf Shantung kaoliang	C.I. 293	Manhattan, Kansas
Dwarf White milo x Blackhull	38M426	Manhattan, Kansas
Dwarf White milo x Blackhull	35M215	Manhattan, Kansas
Dwarf White milo x Hegari	H.C. 282	Lawton, Oklahoma
Dwarf White milo Sel.	No. 36	Davis, California
Dwarf White milo Sel.	No. 38	Davis, California
Dwarf White milo Sel.	No. 42	Davis, California
Dwarf Yellow milo Sel.	G.C.C. 21	Garden City, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-2	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-7	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-12	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-17	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-22	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-24	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-32	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-33	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-34	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-35	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-36	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-37	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-38	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-39	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-40	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-41	College Station, Texas
Dwarf Yellow milo Sel.	T.S. 25243-48	Manhattan, Kansas
Dwarf Yellow milo Sel.	T.S. 25243-276	Chillicothe, Texas
Dwarf Yellow milo Sel.	T.S. 25243-332	Lubbock, Texas
Dwarf Yellow milo Sel. (c)	T.S. 25243-338	Lubbock, Texas
Dwarf Yellow milo Sel.	T.S. 25243-516	Chillicothe, Texas
Dwarf Yellow milo Sel.	T.S. 25243-560	Chillicothe, Texas
Dwarf Yellow milo x Dwarf Freed	H.C. 303	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 338	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 339	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 341	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 345	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 349	Hays, Kansas
Dwarf Yellow milo x Dwarf Freed	H.C. 399	Hays, Kansas
Dwarf Yellow milo x Hegari (Sel. of Wdw. 13-10)	G.C. 32-1	Garden City, Kansas
Dwarf Yellow milo x Hegari	Wdw. 14-11	Woodward, Oklahoma
Dwarf Yellow milo x Pink kafir Sel. (from C.I. 903)	G.C. 301	Garden City, Kansas

Variety	Accession Number	Sources of Seed
	Resistant	
Early Kalo	C.I. 1009	Hays, Kansas
Early Red (Red x Sunrise)	51-5S	Manhattan, Kansas
Early Sumac sorgo	F.C. 6611	Hays, Kansas
Early White Durra	S.P.I. 57045	Woodward, Oklahoma
Eason kafir	T.S. 21193	Lubbock, Texas
Extra Dwarf feterita	T.S. 6312	Lubbock, Texas
Extra Early Pink	C.I. 1107	Akron, Colorado
Extra Early Sumac sorgo Sel. (from Dalhart Strain)	GC 381037	Garden City, Kansas
Fargo	C.I. 809	Woodward, Oklahoma
Feterita	C.I. 182	Manhattan, Kansas
Feterita x Black Spanish broomcorn	K.B. 36403	Manhattan, Kansas
Feterita x Dwarf Shantung kaoliang No. 1	C.I. 867	Woodward, Oklahoma
Feterita x Early Sumac	K.B. 36400	Manhattan, Kansas
(Feterita x kafir) x kafir	F.C. 8951	Woodward, Oklahoma
Feterita x Smith	H.C. 312	Hays, Kansas
Finney milo (Dwarf Yellow milo Sel.)	C.I. 1089	Garden City, Kansas
Fremont	C.I. 1108	Akron, Colorado
Greeley (Tribune 12)	C.I. 972	Tribune, Kansas
Grohoma	C.I. 920	Manhattan, Kansas
Hegari	C.I. 620	Hays, Kansas
Highland kafir	C.I. 1105	Akron, Colorado
Hybrid Dwarf feterita	K.B.32316	Manhattan, Kansas
Hydro kafir	C.I. 1066	Lawton, Oklahoma
Improved Coes	C.I. 1104	Akron, Colorado
Jerusalem Corn	K.B. 31119	Manhattan, Kansas
Kafir-cane	G.C. 391045	Garden City, Kansas
Kafir x Dwarf Yellow milo	C.I. 970	Woodward, Oklahoma
Kafir x Dwarf Yellow milo	Wdw. 8-2-6	Woodward, Oklahoma
Kafir x feterita	K.B. 2510	Manhattan, Kansas
Kafir x milo	Wdw. 38-1-2-1	Woodward, Oklahoma
Kalo	C.I. 902	Hays, Kansas
Kalo Sel.	H.C. 3416	Hays, Kansas
Kalo Sel.	H.C. 3421	Hays, Kansas
Keiskama	South Africa	Manhattan, Kansas
Klerksdorp No. 2	South Africa	Manhattan, Kansas
Leoti sorgo	F.C. 6610	Manhattan, Kansas
Leoti sorgo x feterita	H.C. 3429	Hays, Kansas
Leoti sorgo x feterita	H.C. 387	Hays, Kansas
Manchu Brown kaoliang	C.I. 171	Manhattan, Kansas
Manko	F.C. 8991	Lubbock, Texas

Variety	Accession Number	Sources of Seed
	Resistant	
Milo x kafir (from Sel. 27317)	GC 391332	Garden City, Kansas
Modoc	C.I. 905	Manhattan, Kansas
Modoc Sel.	H.C. 383	Hays, Kansas
Oosthuizen	South-Africa	Manhattan, Kansas
Pierce kaferita	K.B. 27101	Manhattan, Kansas
Pink Freed No. 14	C.I. 973	Tribune, Kansas
Pink Freed No. 36	C.I. 974	Tribune, Kansas
Pink kafir	C.I. 473	Manhattan, Kansas
Premo	C.I. 873	Manhattan, Kansas
Pretoria Pink	South Africa	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39110	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39111	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39112	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39113	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39114	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39115	Manhattan, Kansas
Pygmy milo Sel.	K.B. 39116	Manhattan, Kansas
Red Amber x feterita	Sel. 2473	Manhattan, Kansas
Red Amber sorgo	F.C. 7038	Manhattan, Kansas
Red Durra	---------	Manhattan, Kansas
Red kafir	---------	Garden City, Kansas
Red kafir Sel.	37M133	Manhattan, Kansas
Red kafir Sel.	37M150	Manhattan, Kansas
Red x sorgo	F.C. 16185	Chillicothe, Texas
Reed kafir	C.I. 628	Woodward, Oklahoma
Sapling (G.C. "Honey")	---------	Garden City, Kansas
Scarborough broomcorn	K.B.30107	Manhattan, Kansas
Sedan Red kafir	C.I. 1103	Dalhart, Texas
Shallu	K.B. 32373	Manhattan, Kansas
Sharon kafir x Darso	Wdw. 47-5	Dalhart, Texas
Sharon kafir x Darso	Wdw. 47-9	Dalhart, Texas
Sharon kafir x Darso	Wdw. 48-12	Dalhart, Texas
Sooner milo Sel. (d)	GC 3858	Garden City, Kansas
Spur feterita	C.I. 623	Woodward, Oklahoma
Standard Sumac sorgo	F.C. 1712	Garden City, Kansas
Sudan grass	---------	Garden City, Kansas
Sugar Drip sorgo	---------	Manhattan, Kansas
Sumac x feterita	F.C. 9164	Hays, Kansas
Sumac x feterita	F.C. 9165	Hays, Kansas
Sumac x feterita	F.C. 9163	Hays, Kansas
Sumac x White African	F.C. 16187	Hays, Kansas
Sunrise kafir	C.I. 472	Garden City, Kansas

Variety	Accession Number	Sources of Seed
	Resistant	
Tricker Mixture	C.I. 1112	Garden City, Kansas
Waconia Orange sorgo	C.I. 1113	Garden City, Kansas
Weskan	F.C. 9126	Manhattan, Kansas
Weskan x Greeley	H.C. 384	Hays, Kansas
Western Atlas	K.B. 32308	Manhattan, Kansas
Western Blackhull kafir	C.I. 906	Hays, Kansas
Wheatland Sel. (From G.C.C.41)	GC 38288	Garden City, Kansas
Wheatland Sel. (From G.C.C.42)	GC.38291	Garden City, Kansas
Wheatland Sel. (From G.C.C.43)	GC 38296	Garden City, Kansas
White Custer	H.C. 305	Hays, Kansas
White Darso	Wdw. No. 101	Woodward, Oklahoma
White Durra	C.I. 81	Manhattan, Kansas
White Durra (California)	(Standard)	Woodward, Oklahoma
White Sumac x Colliers	Wdw. 8-25	Woodward, Oklahoma
White Yolo	K.B. 2525	Manhattan, Kansas
Wintersome	P.E.I. 133090	Manhattan, Kansas
Witchweed Resistant White	South Africa	Manhattan, Kansas
Wonder	C.I. 872	Garden City, Kansas
Yellow Darso	Wdw. 36-12	Woodward, Oklahoma
Yellow Sumac sorgo	Wdw. 97-14	Woodward, Oklahoma

(a) C.I. refers to accession number of Division of Cereal Crops and Diseases, U.S.D.A.
P.E.I. refers to accession number of the Plant Exploration Introduction.
T.S. refers to Texas Selection Number.
F.C. refers to accession number of Division of Forage Crops and Diseases, U.S.D.A.
Sel. refers to Selection number.
S.P.I. refers to accession number of Division of Plant Exploration and Introduction, U.S.D.A.
Wdw. refers to Woodward, Oklahoma.
Man. refers to Manhattan, Kansas.
K.B. refers to Kansas Botany, K.S.C., Manhattan, Kansas.
H.C. refers to Fort Hays Branch Experiment Station cereal number.
S.A. refers to Sorghum accession number at Chillicothe and Lubbock, Texas.
G.C. refers to Garden City Branch Experiment Station cereal number.
La. refers to Lawton, Oklahoma, Experiment Station number.

(b) A number of resistant selections of Colby milo have been made at Manhattan and Garden City. These are not listed separately.

(c) This selection was named "Texas milo" and distributed to farmers in the spring of 1940 by the Texas Experiment Station.

(d) A large number of Sooner selections that are resistant have been made at Manhattan and Garden City. The number is too large to list here.

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Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Supplement 127

Crop Losses From Plant Diseases in the United States

1939

December 31, 1940.

(Issued June 30, 1941)

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

CROP LOSSES FROM PLANT DISEASES IN THE UNITED STATES IN 1939

Compiled by

H. A. Edson and Jessie I. Wood

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Supplement 127

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Table 1. Estimated reduction in yield due to scab (Gibberella zeae), leaf rust (Puccinia rubigo-vera tritici), stem rust (P. graminis), bunt (Tilletia spp.), loose smut (Ustilago tritici), foot rots and seedling blights (various organisms), and other diseases, 1939.

State	Production 1,000 bushels	Scab %	Scab 1,000 bushels	Leaf rust %	Leaf rust 1,000 bushels	Stem Rust %	Stem Rust 1,000 bushels	Bunt %	Bunt 1,000 bushels	Loose smut %	Loose smut 1,000 bushels	Foot rots %	Foot rots 1,000 bushels	All diseases %	All diseases 1,000 bushels
Maine	84	0.3	+	-	-	t	+	-	-	t	+	-	-	0.3	+
N. Y.	6382	t	+	15.	1235	t	+	1.	82	-	-	0.5	41	22.5	1852
*N. J.	1170	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	19421	t	+	10.	2290	t	+	2.4	550	0.8	183	t	+	15.2	3481
N.Atl.	27057	t	+	11.3	3525	t	+	2.0	632	0.6	183	0.1	41	17.1	5333
Ohio	37150	1.5	590	0.5	197	t	+	3.	1179	0.5	197	-	-	5.5	2163
Ind.	27612	t	+	5	1485	t	+	0.5	148	1.5	445	t	+	7	2078
Ill.	39021	1.	456	10.	4559	t	+	t	+	1.1	501	-	-	14.4	6564
Mich.	15424	0.3	47	0.1	16	t	+	1.	157	0.1	16	-	-	2.	315
Wis.	1350	t	+	1.9	26	t	+	1.	14	0.2	3	t	+	3.1	43
Minn.	22108	2.	475	2	475	t	+	t	+	t	+	3	713	7.	1663
Iowa	6490	1.	81	3	243	t	+	0.1	8	0.1	8	15.5	1258	20.	1622
*Mo.	29241	-	-			t	+	-	-	-	-	-	-	-	-
N. D.	84062	t	+	t	+	t	+	0.5	429	0.5	429	1.	858	2,	1716
*S. D.	19424	-	-	-	-	t	+	-	-	-	-	-	-	-	-
Neb.	36376	-	-	t	+	t	+	t	+	0.2	73	-	-	0.2	73
Kan.	111657	-	-	1.5	1739	0.2	232	0.5	580	1.5	1739	-	-	3.7	4290
N. Cen.	429915	0.4	1649	2.2	8740	t	232	0.6	2515	0.8	3411	-	2829	5.1	20527
Del.	1296	-	-	2	28	-	-	1.	14	-	-	3.	41	6	83
Md.	7352	2	162	2.5	203	t	+	2.	162	2.	162	-	-	9.5	770
Va.	7511	1.	83	2.	165	2.	165	2.	165	1	83	-	-	9.2	760
W. Va.	2102	2.	46	t	+	1.	23	t	+	2	46	-	-	8	184
N. C.	5100	1	57	1	57	-	-	5	287	2	115	1.	57	11	630
*S. C.	2415	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ga.	1770	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.Atl.	27546	1.3	348	1.8	453	0.7	188	2.4	628	1.6	406	-	98	9.4	2427

WHEAT(Continued)

State	Production 1,000 bushels	Scab %	Scab 1,000 bushels	Leaf rust %	Leaf rust 1,000 bushels	Stem Rust %	Stem Rust 1,000 bushels	Bunt %	Bunt 1,000 bushels	Loose smut %	Loose smut 1,000 bushels	Foot rots %	Foot rots 1,000 bushels	All diseases %	All diseases 1,000 bushels
		Estimated reduction in yield due to disease													
*Ky	4071	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	4117	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ark.	390	-	-	5.	21	-	-	t	+	t	+	-	-	5.	21
Okla.	60438	-	-	5.	3555	t	+	2.	1422	4.	2844	3.	2133	15.	10665
Texas	27650	-	-	1.	293	t	+	0.5	146	2.	585	2	585	5.5	1609
S.Cen.	96738	-	-	3.8	3869	t	+	1.6	1568	3.4	3429	2.7	2718	12.2	12295
Mont.	56608	0	0	0	0	0	0	0.5	287	0	0	1.	575	1.5	862
Idaho	22624	0	0	t	+	t	+	1.	230	t	+	t	+	1.5	345
Wyo.	2812	0	0	t	+	t	+	1.	28	-	-	-	-	1	28
*Colo.	12217	0	0	-	-	t	+	-	-	-	-	-	-	-	-
*N. M.	2960	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	805	0	0	-	-	1.	9	5.	43	-	-	-	-	6.	52
*Utah	3989	0	0	-	-	-	-	-	-	-	-	-	-	-	-
*Nev.	512	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Wash.	43822	t	+	t	+	t	+	3.	1374	t	+	1.	458	4.3	1969
Ore.	16818	-	-	t	+	t	+	0.9	156	t	+	1.3	226	3.1	538
*Calif.	10548	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Far West.	173715	t	+	t	+	t	9	1.4	2118	t	+	0.9	1259	2.6	3794
U. S.	754971	0.3	1997	2.3	16587	t	429	1.1	7461	1.1	7429	- (1.0)	6945	6.3	44376

*Omitted from calculations for U. S. and section percentage loss.

Percentage of total listed production in States reporting: U. S. 88; N. Atl. 94; N. Cent. 89; S. Atl. 85; S. Cent. 91; Far West 83.

Table 2. Estimated reduction in yield from stripe (Helminthosporium gramineum), foot rots and seedling blights (Helminthosporium, Fusarium, Ophiobolus graminis, and other fungi), loose smut (Ustilago nuda etc.), covered smut (U. hordei),

State	Production 1,000 Bushels	Stripe %	Stripe 1,000 Bushels	Foot rots %	Foot rots 1,000 Bushels	Loose smut %	Loose smut 1,000 Bushels	Covered smut %	Covered smut 1,000 Bushels
*Maine	116	-	-	-	-	-	-	-	-
*Vermont	140	-	-	-	-	-	-	-	-
New York	3942			2 a/	94	t	+	1	47
*New Jersey	150	-	-	-	-	-	-	-	-
Pa.	3658	t	+	1.	43	4.	170	7.	298
N. Atlantic	8006	-	+	1.5	137	1.9	170	3.9	345
Ohio	1250	-	-	-	-	1	13	1.	13
Indiana	903	t	+	-	-	0.1	1	0.1	1
Illinois	4140	1.	54	t	+	1.1	59	1.7	92
Michigan	5771	0.1	6	-	-	0.1	6	0.1	6
Wisconsin	22591	t	+	t	+	0.5	116	0.1	23
Minnesota	59808	t	+	1.	613	t	+	0.5	307
Iowa	13794	t	+	10.	1693	1.	169	2.	339
*Missouri	3423	-	-	-	-	-	-	-	-
N. D.	30618	t	+	0.5	157	t	+	0.8	251
*S. D.	24633	-	-	-	-	-	-	-	-
*Nebraska	14651	-	-	-	-	-	-	-	-
Kansas	7480	t	+	-	-	1.5	116	1.8	139
N. Central	189062	t	60	1.6	2463	0.3	480	0.8	1171
Delaware		-	-	-	-	20	+	-	-
Maryland	2160	3	73	-	-	3	73	3.5	85
Virginia	2320	t	+	-	-	2	51	3	76
*W. Va.	245	-	-	-	-	-	-	-	-
N. C.	220	2	5	1.	2	1	2	1.	2
S. Atlantic	4945	1.4	78	-	2	2.4	126	3.1	163
*Kentucky	1122	-	-	-	-	-	-	-	-
*Tennessee	962	-	-	-	-	-	-	-	-
Oklahoma	6048	-	-	1.	64	2.	129	3.	194
Texas	2955	t	+	-	-	2.	61	1.	31
S. Central	11087	-	+	(0.7)	64	(2.0)	190	(2.4)	225
*Montana	5088	-	-	-	-	-	-	-	-
Idaho	5580	t	+	-	-	-	-	t	+
*Wyoming	1560	t	+	-	-	-	-	-	-
*Colorado	7566	-	-	-	-	-	-	-	-
*New Mexico	160	-	-	-	-	-	-	-	-
Arizona	1122	-	-	-	-	-	-	3.	35
*Utah	2405	-	-	-	-	-	-	-	-
*Nevada	525	-	-	-	-	-	-	-	-
Washington	3120	0.1	3	1.3	43	t	+	0.3	10
Oregon	5222	t	+	1.3	73	t	+	0.3	17
*California	30850	-	-	-	-	-	-	-	-
Far Western	63198	-	3	-	116	t	+	-	62
U. S.	276298	t	141	- (1.4)	2782	0.5	966	1.	1966

a/ N. Y., stripe, Helminthosporium foot rot.

Table 2 Scab (Gibberella zeae), powdery mildew (Erysiphe graminis), leaf rusts (Puccinia anomala and P. rubigo-vera tritici), stem rust (P. graminis), and other diseases, 1939.

State	Scab %	Scab Bushels	Powdery Mildew %	Powdery Mildew Bushels	Leaf rusts %	Leaf rusts Bushels	Stem rust %	Stem rust Bushels	All diseases %	All diseases Bushels
	Estimated reduction in yield due to diseases									
*Maine	-	-	-	-	-	-	-	-	-	-
*Vermont	-	-	-	-	-	-	-	-	-	-
New York	-	-	10.	469	3	141	t	+	16.	751
*New Jersey	-	-	-	-	-	-	-	-	-	-
Pennsylvania	t	+	0.2	9	1	43	t	+	14.2	606
N. Atlantic	-	+	5.3	478	2.1	184	t	+	15.2	1357
Ohio	1.5	20	0.5	7	-	-	t	+	4.	53
Indiana	0.2	2	0.2	2	0.4	4	0	0	1.	10
Illinois	9.	486	0.5	27	10.	540	t	+	23.3	1258
Michigan	0.5	29	0.1	6	-	-	0	0	1.4	82
Wisconsin	1.	232	0.5	116	0.5	116	0	0	2.6	603
Minnesota	-	-	0	0	0	0	1.	613	2.5	1533
Iowa	4.	677	t	+	-	-	t	+	18.5	3132
*Missouri	-	-	-	-	-	-	0	0	-	-
N. Dakota	t	+	-	-	-	-	t	+	2.3	721
*S. Dakota	-	-	-	-	-	-	t	+	-	-
*Nebraska	-	-	-	-	-	-	t	+	-	-
Kansas	-	-	-	-	-	-	-	-	3.3	255
N. Central	0.9	1446	0.1	158	0.4	660	0.4	613	4.9	7647
Delaware	-	-	-	-	2.	+	-	-	22	+
Maryland	1.5	36	t	+	-	-	t	+	11	267
Virginia	1.	25	1.5	38	1.	25	t	+	8.5	215
*W. Va.	-	-	-	-	-	-	0	0	-	-
N. C.	1.	2	1.	2	1.	2	-	-	9.	19
S. Atlantic	1.3	63	0.8	40	0.5	27	t	+	9.6	501
*Kentucky	-	-	-	-	-	-	-	-	-	-
*Tennessee	-	-	-	-	-	-	-	-	-	-
Oklahoma	-	-	-	-	t	+	t	+	6.5	419
Texas	-	-	t	+	t	+	0.1	3	3.1	95
S. Central	-	-	t	+	t	+	-	3	(5.4)	514
*Montana	-	-	-	-	-	-	0	0	-	-
Idaho	-	-	t	+	-	-	-	-	t	+
*Wyoming	-	-	-	-	-	-	0	0	-	-
*Colorado	-	-	-	-	-	-	0	0	-	-
*New Mexico	-	-	-	-	-	-	-	-	-	-
Arizona	-	-	-	-	-	-	-	-	3.	35
*Utah	-	-	-	-	-	-	-	-	-	-
*Nevada	-	-	-	-	-	-	-	-	-	-
Washington	-	-	2.	65	t	+	t	+	4.7	154
Oregon	-	-	3.	167	t	+	t	+	6.4	357
*California	-	-	-	-	-	-	-	-	-	-
Far Western	-	-	-	232	t	+	t	+	-	546
U. S.	0.8	1509	0.5	908	0.5	871	0.3	616	5.5	10565

*Omitted from calculations for United States and section percentage loss.
Percentage of total listed production in States reporting: U.S. 66, N.Atl.95, N. Cent. 77, S. Atl. 95, S. Cent. 81, Far West 24.

RYE

Table 3. Reduction in yield due to smut (Urocystis occulta), ergot (Claviceps purpurea), leaf rust (Puccinia rubigo-vera secalis).

State	Production 1,000 Bushels	Estimated reduction in yield due to diseases					
		Smut		Ergot		Leaf rust	
		%	1,000 Bushels	%	1,000 Bushels	%	1,000 Bushels
Massachusetts	-			t	+		
New York	341	t	+	-	-	t	+
*New Jersey	391	-	-	-	-	-	-
Pennsylvania	1058	t	+	t	+	3	34
N. Atlantic	1790	t	+	t	+	2.3	34
Ohio	1232	0.5	6	t	+	0.1	1
*Indiana	1608	-	-	-	-	-	-
Illinois	1100	0.3	3	t	+	1	11
Michigan	1512	0.1	2	0.1	2	-	-
Wisconsin	2380	t	+	1	24	1	24
Minnesota	7350	0	0	0.5	37	-	-
Iowa	1044	0	0	0.5	6	0.1	1
*Missouri	420	-	-	-	-	-	-
North Dakota	7106	0	0	t	+	-	-
*South Dakota	4752	-	-	-	-	-	-
*Nebraska	3568	-	-	-	-	-	-
*Kansas	650	-	-	-	-	-	-
N. Central	32722	t	11	0.3	69	0.2	37
Delaware	117	-	-	-	-	-	-
*Maryland	250	-	-	-	-	-	-
Virginia	576	t	+	t	+	t	+
*West Virginia	74	-	-	-	-	-	-
North Carolina	458	-	-	-	-	0.5	2
*South Carolina	95	-	-	-	-	-	-
*Georgia	136	-	-	-	-	-	-
S. Atlantic	1706	-	+	-	+	-	2
*Kentucky	126	-	-	-	-	-	-
*Tennessee	294	-	-	-	-	-	-
Arkansas		-	-	-	-	1	+
Oklahoma	527	-	-	-	-	1	5
Texas	60	-	-	-	-	t	+
S. Central	1007	-	-	-	-	-	5
Montana	420	-	-	t	+	0	0
*Idaho	55	-	-	-	-	-	-
*Wyoming	200	-	-	-	-	-	-
*Colorado	429	-	-	-	-	-	-
*Utah	32	-	-	-	-	-	-
Washington	260	-	-	t	+	t	+
Oregon	562	-	-	t	+	t	+
*California	66	-	-	-	-	-	-
Far Western	2024	-	-	t	+	t	+
United States	39249	t	11	0.3	69	0.3	78

*Omitted from calculations for U. S. and section percentage loss

Percentage of total listed production in States reporting: U. S. 67; N. Atl. 78; N. Cent. 66; S. Atl. 67; S. Cent. 58; Far West 61.

RYE(Continued)

Table . Stem rust (P. graminis), footrots and seedling blights (various organisms), anthracnose (Colletotrichum graminicola), and other diseases, 1939.

State	Estimated reduction in yield due to disease							
	Stem Rust		Foot rots		Anthracnose		All diseases	
	%	Bushels	%	Bushels	%	Bushels	%	Bushels
Massachusetts	1.	+					1	+
New York	-	-	-	-	-	-	t	+
*New Jersey	-	-	-	-	-	-	-	-
Pennsylvania	t	+	-	-	4	46	7.	80
N. Atlantic	t	+	-	-	3.1	46	5.4	80
Ohio	t	+	-	-	t	+	0.6	7
*Indiana	0	0	-	-	-	-	-	-
Illinois	t	+	-	-	t	+	3.4	38
Michigan	t	+	-	-	0.1	2	0.5	9
Wisconsin	0	0	-	-	t	+	2	48
Minnesota	0	0	t	+	0	0	0.5	37
Iowa	t	+	5	55	0.1	1	5.7	63
*Missouri	-	-	-	-	-	-	-	-
North Dakota	0	0	-	-	0	0	t	+
*South Dakota	0	0	-	-	-	-	-	-
*Nebraska	t	+	-	-	-	-	-	-
*Kansas	-	-	-	-	-	-	-	-
N. Central	t	+	-	55	t	3	0.9	202
Delaware	-	-	-	-	-	-	6.	7
*Maryland	-	-	-	-	-	-	-	-
Virginia	t	+	t	+	-	-	t	+
*West Virginia	0	0	-	-	-	-	-	-
North Carolina	-	-	5.	25	-	-	7.5	37
*South Carolina	-	-	-	-	-	-	-	-
*Georgia	-	-	-	-	-	-	-	-
S. Atlantic	-	+	-	25	-	-	3.7	44
*Kentucky	-	-	-	-	-	-	-	-
*Tennessee	-	-	-	-	-	-	-	-
Arkansas	-	-	-	-	-	-	1	+
Oklahoma	t	+	-	-	-	-	1	5
Texas	t	+	-	-	-	-	t	+
S. Central	-	+	-	-	-	-	-	5
Montana	0	0	0	0	0	0	t	+
*Idaho	-	-	-	-	-	-	-	-
*Wyoming	0	0	-	-	-	-	-	-
*Colorado	0	0	-	-	-	-	-	-
*Utah	-	-	-	-	-	-	-	-
Washington	-	-	0.1	+	-	-	0.1	+
Oregon	-	-	0.3	2	-	-	0.3	2
*California	-	-	-	-	-	-	-	
Far Western	-	-	0.2	2	-	-	0.2	2
United States	t	+	0.3	82	0.2	49	1.3	333

OATS

Table . Estimated reduction in yield due to loose smut (Ustilago avenae) covered smut (U. levis), stem rust (Puccinia graminis).

State	Production 1,000 Bushels	Estimated reduction in yield due to diseases: Loose smut %	Loose smut 1,000 Bushels	Covered smut %	Covered smut 1,000 Bushels	Stem rust %	Stem rust 1,000 Bushels
Maine	4,598	0.3	14	-	-	t	+
*New Hampshire	259	-	-	-	-	-	-
*Vermont	1,881	-	-	-	-	-	-
Massachusetts	231	4.	10	+	+	1.	2
*Rhode Island	62	-	-	-	-	-	-
*Connecticut	175	-	-	-	-	-	-
New York	25,806	5.	1399	+	+	t	+
*New Jersey	1,260	-	-	-	-	-	-
Pennsylvania	26,274	8	2351	+	+	t	+
N. Atlantic	60,546	6.1	3774	+	+	t	2
Ohio	33,150	1.	340	1.	340	t	+
Indiana	25,225	1.	260	1.	260.	1.	260
Illinois	93,540	2.3	2880	1.	1252	t	+
Michigan	42,712	0.2	86	0.1	43	t	+
Wisconsin	71,012	4.	3139	2.	1569	0.5	392
Minnesota	151,652	2.	3127	+	+	t	+
Iowa	154,818	4.5	9048	0.5	1005	t	+
*Missouri	40,920	-	-	-	-	t	+
North Dakota	35,297	0.5	178	0.5	178	t	+
*South Dakota	43,929	-	-	-	-	t	+
*Nebraska	20,576	-	-	-	-	t	+
Kansas	21,173	2.1	454	+	+	t	+
N. Central	734,004	2.7	19512	0.6	4647	t	652
*Delaware	87	-	-	-	-	-	-
Maryland	1,128	2.	23	-	-	0.1	1
Virginia	1,600	3.	52	3.5	61	1.	17
West Virginia	1,460	5.	78	+	+	t	+
North Carolina	5,692	2.	120	-	-	-	-
*South Carolina	11,515	-	-	-	-	-	-
Georgia	8,946	2.	184	-	-	-	-
*Florida	124	-	-	-	-	-	-
S. Atlantic	30,552	2.3	457	0.3	61	0.1	18
*Kentucky	952	-	-	-	-	-	-
*Tennessee	1,445	-	-	-	-	-	-
*Alabama	2,838	-	-	-	-	-	-
*Mississippi	2,736	-	-	-	-	-	-
Arkansas	2,904	1.	31	1.	31	t	+
*Louisiana	1,664	-	-	-	-	-	-
Oklahoma	21,114	5.	1135	1.	227	t	+
Texas	28,750	2.	601	2.	601	t	+
S. Central	62,403	-	1767	-	859	t	+
Montana	8,002	5.	471	0	0	0	0
Idaho	6,232	t	+	t	+	-	-
Wyoming	2,288	-	-	t	+	0	0
*Colorado	4,205	-	-	-	-	0	0
*New Mexico	638	-	-	-	-	-	-
Arizona	230	2	5	5	12	-	-
*Utah	980	-	-	-	-	-	-
*Nevada	245	-	-	-	-	-	-
Washington	11,221	0.2	23	0.1	12	0.4	46
Oregon	11,725	0.3	37	0.1	12	0.8	98
*California	3,944	-	-	-	-	-	-
Far Western	49,710	1.3	536	0.1	36	0.3	144
United States	937,215	2.9	26046	0.6	5603	0.1	816

*Omitted from calculations for United States and section percentage loss.
Percentage of total listed production in States reporting: U.S., 85; N. Atl. 94; N. Cent. 86; S. Atl. 62; S. Cent. 85; Far West. 80.

OATS (Continued)

Table (Continued). Crown rust (Puccinia coronata), blast (non-parasitic) and other diseases, 1939.

State	Crown rust %	Crown rust 1,000 Bushels	Blast %	Blast 1,000 Bushels	All diseases %	All diseases 1,000 Bushels
Maine	-	-	-	-	0.3	14
*New Hampshire	-	-	-	-	-	-
*Vermont	-	-	-	-	-	-
Massachusetts	1.	2	-	-	7.	16
*Rhode Island	-	-	-	-	-	-
*Connecticut	-	-	-	-	-	-
New York	0.8	224	2.	560	7.8	2183
*New Jersey	-	-	-	-	-	-
Pennsylvania	0.1	29	1.5	441	10.6	3115
N. Atlantic	0.4	255	1.6	1001	8.6	5328
Ohio	0.5	170	0	0	2.5	850
Indiana	t	+	t	+	3.	780
Illinois	3.	3757	10.	12522	25.3	31681
Michigan	t	+	t	+	1.	431
Wisconsin	3.	2354	-	-	9.5	7454
Minnesota	1	1563	-	-	3.	4690
Iowa	3.5	7037	0.5	1005	23.	46243
*Missouri	-	-	-	-	-	-
North Dakota	t	+	t	+	1.	356
*South Dakota	-	-	-	-	-	-
* Nebraska	-	-	-	-	-	-
Kansas	0	0	-	-	2.1	454
N. Central	2.1	14881	1.9	13527	12.9	92939
*Delaware	-	-	-	-	-	-
Maryland	1.5	18	-	-	3.7	43
Virginia	1.	17	-	-	8.5	147
West Virginia	t	+	-	-	6.	94
North Carolina	1.	60	-	-	5.5	331
*South Carolina	-	-	-	-	-	-
Georgia	1.	92	-	-	3.	276
*Florida	-	-	-	-	-	-
S. Atlantic	0.9	187	-	-	4.5	891
*Kentucky	-	-	-	-	-	-
*Tennessee	-	-	-	-	-	-
*Alabama	-	-	-	-	-	-
*Mississippi	-	-	-	-	-	-
Arkansas	5	156	-	-	7.	218
*Louisiana	-	-	-	-	-	-
Oklahoma	1.	227	-	-	7.	1589
Texas	0.2	60	-	-	4.4	1322
S. Central	-	443	-	-	-	3129
Montana	0	0	10.	941	15.	1412
Idaho	-	-	-	-	t	+
Wyoming	-	-	-	-	t	+
*Colorado	-	-	-	-	-	-
*New Mexico	-	-	-	-	-	-
Arizona	-	-	-	-	7.	17
*Utah	-	-	-	-	-	-
*Nevada	-	-	-	-	-	-
Washington	0.4	46	0.4	46	2.6	300
Oregon	1.	123	0.5	61	4.4	540
*California	-	--	-	-	-	-
Far Western	0.4	169	2.5	1048	5.4	2269
United States	1.8	15935	1.7	15576	11.6	104556

FIELD CORN

Table . Reduction in yield due to smut (Ustilago zeae), foot rots (various organisms), stalk and ear rots (Diplodia, mostly zeae), ear rots and stalk rots (various organisms other than Diplodia), bacterial wilt (Phytomonas stewartii), and other diseases, 1939.

State	Production 1,000 Bushels	Smut %	Smut 1,000 Bushels	Foot rots %	Foot rots 1,000 Bushels	Diplodia %	Diplodia 1,000 Bushels	Ear rots %	Ear rots 1,000 Bushels	Stalk rots %	Stalk rots 1,000 Bushels	Bacterial wilt %	Bacterial wilt 1,000 Bushels	All diseases %	All diseases 1,000 Bushels
*Maine	546	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*N. H.	615	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Vt.	3040	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass.	1520	1.	16	0.9	14	-	-	-	-	-	-	-	-	2.	32
*R. I.	410	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	1950	1.	20	-	-	-	-	-	-	-	-	-	-	1.	20
*N. Y.	24465	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*N. J.	7182	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	58140	4.	2613	2.	1307	t	+	4.	2613	-	-	t	+	11. b/	7186
N.Atl.	97863	3.8	2649	1.9	1321	-	+	3.8	2613	-	-	t	+	10.5	7238
Ohio	171250	0.5	951	-	-	4.5	8563	1.	1903	0.5	951	3.5	6660	2.	19028
Ind.	213416	1.	2178	-	-	1.	2178	t	+	0	0	t	+	2	4356
Ill.	418652	1.5	7294	t	+	6.5	31606	0.9	4376	t	+	t	+	13.9 b/	67588
Mich.	58238	0.5	298	0.3	179	0.1	60	0.2	119	-	-	0	0	2.4 c/	1432
Wis.	85970	2.5	2239	t	+	1.5	1343	t	+	t	+	0	0	4.	3582
Minn.	204796	3.	6571	0.5	1095	1.5	3285	0.5	1095	1.	2190	0	0	6.5	14236
Iowa	503776	4.	22390	4.2 a/	23510	1.	5598	0.2	1120	0.5	2799	0.1	560	10.	55977
*Mo.	122641	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N. D.	16995	2.	350	-	-	-	-	0.5	88	0.5	88	0	0	3.	526
*S. D.	46848	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neb.	82032	-	-	-	-	-	-	1.5	1249	-	-	-	-	1.5	1249
Kan.	37220	1.5	567	-	-	-	-	-	-	-	-	-	-	1.5	567
N.Cen.	1961834	2.2	42838	1.3	24784	2.7	52633	0.5	9950	0.3	6028	0.4	7220	8.7	168541
Del.	4176	1.	45	-	-	3.	135	3.	135	-	-	-	-	7.	315
Md.	18216	1.	195	2.	390	0.5	98	2.	390	1.	195	0.1	20	6.7	1308
Va.	36530	1.5	619	3.	1238	1.5	619	1.5	619	t	+	t	+	11.5 c/	4746
W. Va.	13994	1.5	220	1.	147	-	-	1.	147	-	-	1.	147	4.5	661

State	Production 1,000 Bushels	Smut %	Smut Bushels	Foot rots %	Foot rots 1000 bushels	Diplodia %	Diplodia 1000 bushels	Ear rots %	Ear rots 1000 bushels	Stalk rots %	Stalk rots 1000 bushels	Bacterial wilt %	Bacterial wilt 1000 bushels	All diseases %	All diseases 1000 bushels
* S. C.	25433	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Ga.	36941	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Fla.	6038	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.Atl.	189415	1.8	2124	1.5	1775	1.1	1375	1.9	2336	0.6	718	0.1	167	9.2	11211
*Ky.	70400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	52700	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	34080	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Miss.	35488	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ark.	32318	t	+	-	-	-	-	-	-	-	-	-	-	-	-
La.	23325	t	+	6.	1627	2.	542	6.	1627	-	-	-	-	14.	3796
Okla.	27216	3.	917	3.	917	1.	306	2.	612	2.	612	t	+	11.	3364
Texas	73376	1.	781	1.	781	1.	781	2.	1561	1.	781	t	+	6.	4685
S.Cen.	348903	-	1698	-	3325	-	1629	-	3800	-	1393	-	+	-	11845
Mont.	1768	t	+	0	0	0	0	0	0	0	0	0	0	t	+
Idaho	1138	t	+	t	+	-	-	-	-	-	-	0	0	t	+
Wyom.	1771	2.	36	-	-	-	-	-	-	-	-	0	0	2.	36
*Colo.	8043	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*N. M.	2552	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	275	10.	31	-	-	-	-	-	-	2.	6	-	-	12.	37
*Utah	475	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Nev.	60	-	-	-	-	-	-	-	-	-	-	0	0	-	-
Wash.	1104	t	+	0.1	1	t	+	-	-	-	-	0	0	0.1	1
Ore.	1891	-	-	0.1	2	-	-	-	-	-	-	0	0	0.2	4
*Calif.	2040	-	-	-	-	-	-	-	-	-	-	-	-	-	
Far Western	21117	-	67	-	3	+	-	-	-	-	6	-	-	-	78
U. S.	2619137	2.1	49376	1.4	31208	2.4	55637	0.8	18699	0.4	8145	0.3	7387	8.6	198913

Percentage of total listed production in States reporting: U. S. 80, N. Atl. 63, N. Cent. 91, S. Atl. 64, S. Cent. 36, Far West 38.

*Omitted from calculations for U. S. and section losses.

a/ Foot and root rots in Iowa, Pythium 4%; in Okla. Sclerotium bataticola 1%.

b/ Black bundle in Pa. 1%; in Ill. 5%- "a complex, probably not all Cephalosporium acremonium".

c/ Leaf blight (Helminthosporium turcicum) caused 1% loss in Mich., 4% in Va.

SWEET CORN

Table . Estimated reduction in yield due to smut (Ustilago zeae) bacterial wilt (Phytomonas stewarti), stalk and ear rots (Diplodia spp.) foot rots and seedling blights (Fusarium spp. and others) and other diseases, 1939.

State	Production: short tons	Smut: %	Smut: Short tons	Bacterial Wilt: %	Bacterial Wilt: Short tons	Diplodia: %	Diplodia: Short tons	Foot rots: %	Foot rots: Short tons	All Diseases: %	All Diseases: Short tons
*Maine	23300	-	-	0	0	-	-	-	-	-	-
*New Hampshire	400	-	-	0	0	-	-	-	-	-	-
*Vermont	2600	-	-	0	0	-	-	-	-	-	-
Massachusetts		4.	+	t	+	-	-	2.	+	6.	+
New York	46400	2	947	t	+	-	-	-	-	2.	947
Pennsylvania	18500	4	841	5.	1051	t	+	3.	631	12.	2523
Ohio	37200	0.1	38	2.	760	t	+	-	-	2.1	798
Indiana	67300	0.5	347	2.	1388	0.5	347	t	+	3.	2082
Illinois	124800	t	+	0.3	376	-	-	-	-	0.3	376
Michigan	2200	0.1	2	0	0	0.1	2	0.1	2	0.7	15
Wisconsin	42700	5.	2247	0	0	t	+	t	+	5.	2247
Minnesota	151200	3.	4775	0	0	1.	1592	1	1592	5.	7959
Iowa	40500	8.	3733	0.1	47	5	2333	-	-	13.2	6160
North Dakota		3.	+	0	0	-	-	-	-	3.	+
*Nebraska	2800	-	-	-	-	-	-	-	-	-	-
Delaware	1400	2.	30	-	-	1.	15	5.	76	8.	121
Maryland	51200	1.5	814	1.	543	2.	1086	1.	543	5.7	3095
West Virginia		2.	+	1.	+	-	-	-	-	3.	+
N. C.		0.5	+	-	-	1.	+	-	-	3.5	+
*Tennessee	5400	-	-	-	-	-	-	-	-	-	-
Arkansas		t	+	-	+	-	-	-	-	t	+
Montana		t	+	0	0	0	-	1.	+	1.	+
Arizona		10.	+	0	0	-	-	-	-	12.	+
Washington	9900	t	+	0	0	t	+	-	-	t	+
Oregon	3900	t	+	0	0	-	-	t	+	t	+
**Other States	16200										
United States	647900	2.2	13774	0.7	4165	0.9	5375	0.5	2844	4.3	26323

* *Include Colorado, Idaho, Kansas, Kentucky, Missouri, Montana, New Jersey, Oklahoma, South Dakota, Texas, Utah, Virginia, and Wyoming.

*Omitted from calculations for United States percentage loss
Percentage of total listed production in States reporting, 95.

Table . Estimated reduction in yield from stem rot (Fusarium bulbigenum batatas and F. oxysporum f.2), black rot (Ceratostomella fimbriata), scurf (Monilochaetes infuscans), mottle necrosis (Pythium ultimum), soil rot (Actinomyces sp.), and other diseases, and estimated loss from storage rots, including soft rot (Rhizopus spp.), surface rot (Fusarium oxysporum), and others, 1939.

State	Production	Estimated reduction in yield due to diseases																	
		Stem rot		Black rot		Scurf		Mottle necrosis		Soil rot		All diseases		Soft rot		Surface rot		All rots	
	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels	%	1000 bushels
°*N.J.	2325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.		t	+	t	+	-	-	t	+	-	-	1	+	2	+	1	+	3	+
Ind.	315	10	36	-	-	-	-	-	-	3.	11	13	47	-	-	-	-	4	13
°*Ill.	528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iowa	270	10	30	0.1	+	0	0	1	3	0	0	11.2	34	8	22	2	5	10	27
°*Mo.	1105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kans.	240	8	22	2.	5	0.5	1	-	-	1.	3	11.5	31	5	12	-	-	5	12
Del.	675	5	38	4	30	t	+	-	-	1	8	10	76	12	81	7	47	23	155
Md.	1440	4	65	5	82	0.5	8	0.1	2	2	33	11.7	192	-	-	-	-	5	72
°.Va.	4128	10	480	2	96	2	96	-	-	t	+	14.	672	-	-	-	-	-	-
N. C.	8624	12	1218	1	101	1	101	1	101	t	+	15	1521	8	690	12	1035	30	2587
°*S. C.	6834	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Ga.	8892	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Fla.	1140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Ky.	1968	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Tenn.	3713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Ala.	8800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Miss.	6142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
°*Ark.	2680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La.	6935	t	+	0.5	36	-	-	-	-	4	290	4.5	326	2.5	173	-	-	5.5	381
Okla.	945	4	41	4	41	-	-	-	-	-	-	8	82	5	47	3	28	10	94
Texas	3780	0.5	20	5	200	t	+	-	-	0.2	8	5.7	228	-	-	-	-	2	76
°*Calif.	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U. S.	72679	6.4	1950	1.9	591	0.7	206	0.3	106	1.2	353	10.5	3209	4.4	1025	4.8	1115	14.7	3417

Omitted from calculations for United States percentage loss: *for field loss; °for storage loss.
Percentage of total listed production in 10 States reporting, 38.

Table . Reduction in yield from mosaic, leafroll, and other virus diseases (including purple top), late blight (Phytophthora infestans), rhizoctonia (R. solani), blackleg (Erwinia phytophthora), fusarium wilt (Fusarium spp.),

State	Production 1,000 bushels	Mosaic %	Mosaic 1000 bu.	Leaf roll %	Leaf roll 1000 bu.	Others %	Others 1000 bu.	Late blight %	Late blight 1000 bu.	Rhizoctonia %	Rhizoctonia 1000 bu.	Blackleg %	Blackleg 1000 bu.	Fusarium wilt %	Fusarium wilt 1000 bu.
Me.	38250	1.	441	3.	1322	t	+	1.	441	1.5	661	0.5	220	-	-
*N. H.	1395	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vt.	1950	2.	45	5	112	t	+	4.	90	1.	22	t	+	-	-
Mass.	2635	3.	99	3	99	1.5	50	3.	99	7.	232	t	+	-	-
*R.I.	779	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	3238	-	-	-	-	-	-	t	+	-	-	-	-	-	-
N.Y.	26797	1.	350	1.5	525	1.	350	3	1051	1.	350	t	+	1.	350
*N.J.	7480	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	22440	1.	279	2.	558	2[a]	558	1	279	4.	1115	t	+	1.5	418
N.Atl.	104964	1.	1214	2.3	2616	0.8	958	1.7	1960	2.1	2380	0.2	220	0.7	768
Ohio	12600	-	-	4.	599	t	+	0.3	45	0.5	75	t	+	1.	150
Ind.	4560	0.1	6	-	-	t	+	5	275	2.	110	-	-	-	-
*Ill.	3441	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mich.	24250	t	+	t	+	t	+	3.5	1065	0.3	91	1	304	0.3	91
Wis.	17336	1.	200	0.5	100	5.	1002	3.	601	t	+	t	+	1.	200
Minn.	20315		+		+	10.	3125	2.	625	4.	1250	t	+	1.	313
Iowa	5600	8.	700	7.	613	2.	175	t	+	4.	350	0.5	44	t	+
*Mo.	4664	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N.D.	11880	1.	130	0.5	65	t	+	0	0	1	130	1	130	1.5	195
*S.D.	2400	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Neb.	7695	-	-	-	-	-	-	0	0	-	-	-	-	-	-
Kans.	2128	-	-	-	-	2	45	0	0	2	45	t	+	-	-
N.Cen.	116869	0.8	1036	1.1	1377	3.4	4347	2.1	2611	1.6	2051	0.4	478	0.8	949
Del.	320	-	-	-	-	-	-	10.	44	-	-	-	-	-	-
Md.	2375	1.	31	2	62	0.5	16	10.	313	1	31	0.5	16	2	62
Va.	6786	1	81	1	81	1	81	t	+	1	81	1	81	-	-
W.Va.	3040	5.	211	5	211	4[a]	169	5.	211	t	+	2	84	t	+
N.C.	8200	2.	202	1.	101	-	-	3.	304	1.	101	1.	101	1.	101
*S.C.	3108	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ga.	1386	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fla.	3480	0.3	12	1.	39	0.3	12	4.	154	1.	39	0.5	19	-	-
S.Atl.	28695	1.8	537	1.7	494	0.9	278	3.4	1026	0.8	252	1.	301	0.5	163
*Ky.	3864	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	2911	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	4860	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Miss.	1420	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ark.	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La.	2106	2.	44	-	-	-	-	-	-	t	+	-	-	-	-
Okla.	2244	3.	82	3.	82	3.	82	0.	0	1.	27	1	27	1	27
Tex.	2666	t	+	t	+	-	-	0.	0	t	+	-	-	-	-
S.Cen.	23074	-	126	-	82	-	82	-	-	-	27	-	27	-	27
Mont.	1530	2	38	0	0	3	57	0	0	5	94	t	+	3	57
Ida.	29670	4.	1304	t	+	t	+	0	0	1.	326	1	326	2	652
Wyo.	1600	1.	19	-	-	0.4	8	-	-	0.5	10	t	+	1.5	29
*Colo.	14400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*N.M.	480	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	220	3.	11	-	-	-	-	-	-	1	4	0.1	+	-	-
*Utah	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Nev.	280	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wash.	7350	2	163	2	163	t	+	t	+	1.	82	t	+	t	+
*Ore.	7200	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Calif	22644	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Far West	87390	-	1535	-	163	-	65	-	-	-	516	-	326	-	738
U.S.	360992	1.4	4448	1.5	4732	1.8	5730	1.7	5597	1.6	5226	0.4	1352	0.8	2645

Table (Cont'd.) tipburn and hopperburn (nonparasitic and leafhoppers), early blight (*Alternaria solani*), ring rot (*Phytomonas sepedonica*), bacterial wilt and brown rot (*P. solanacearum*), scab (*Actinomyces scabies*), psyllid yellows due to psyllids, and other diseases, 1939.

State	Estimated reduction in yield due to diseases													
	Tipburn and hopperburn		Early blight		Ring rot		Bacterial wilt		Scab		Psyllid yellows		All diseases	
	%	1,000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.
Me.	-	-	5.	2203	1.	441	0	0	0.2	88	0	0	13.2	5817
*N.H.	-	-	-	-	-	-	0	0	-	-	0	0	-	-
Vt.	-	-	1	22	-	-	0	0	-	-	0	0	13.	291
*Mass.	2.	66	t	+	t	+	0	0	1.	33	0	0	20.5	678
*R.I.	-	-	-	-	-	-	0	0	-	-	0	0	-	-
Conn.	5.	170	t	+	-	-	0	0	-	-	0	0	5.	170
N. Y.	0	3503	1.	350	t	+	0	0	3	1051	0	0	23.5	8230
*N. J.	-	-	-	-	-	-	0	0	-	-	0	0	-	-
Pa.	1.	279	1.	279	t	+	0	0	5	1394	0	0	19.5	5438
N.Atl.	3.5	4018	2.5	2854	0.4	441	0	0	2.2	2566	0	0	17.9	20624
Ohio	7	1047	2	299	t	+	-	-	1.	150	0	0	15.8	2365
Ind.	4	220	-	-	-	-	-	-	5	275	0	0	17.1	941
*Ill.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
Mich.	3.	913	2	609	t	+	0	0	10	3043	0	0	20.3	6177
Wis.	2	401	1	200	t	+	0	0	t	+	0	0	13.5	2704
Minn.	0	3125	1	313	3	938	0	0	4	1250	0	0	35	10939
Iowa	8	700	t	+	t	+	0	0	5	438	0	0	36	3152
*Mo.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
N.Dak.	0.5	65	t	+	2	260	0	0	t	+	t	+	8.5	1105
*S.Dak.	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Neb.	-	-	-	-	-	-	0	0	-	-	-	-	-	-
Kans.	-	-	-	-	-	-	0	0	-	-	-	-	5	112
N.Cen.	5.1	6471	1.1	1421	0.9	1198	-	-	4.1	5156	-	-	21.7	27495
Del.	-	-	1	4	-	-	2.	9	10.	44	0	0	28	123
Md.	1	31	0.5	16	-	-	0.5	16	3.	94	0	0	24.	750
Va.	-	-	1	81	-	-	2	162	3	646	0	0	16.	1294
W.Va.	5	211	1	42	t	+	-	-	1	42	0	0	28.	1181
N.C.	1	101	1.	101	-	-	3.	304	1.	101	0	0	19.	1922
*S.C.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Ga.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
Fla.	-	-	1.	39	0.3	12	0.6	23	0.5	19	0	0	9.7	376
S.Atl.	1.1	343	0.9	283	t	12	1.7	514	3.2	946	0	0	18.9	5646
*Ky.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Tenn.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Ala.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Miss.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
*Ark.	-	-	-	-	-	-	-	-	-	-	0	0	-	-
La.	-	-	1.	22	t	+	-	-	t	+	0	0	4	88
Okla.	-	-	-	-	-	-	2	55	3	82	-	-	18	491
Tex.	t	+	1	28	-	-	-	-	5	142	-	-	6	170
S.Cent.	-	-	-	50	-	-	-	55	-	224	-	-	-	749
Mont.	0	0	0	0	0	0	0	0	1	19	t	+	19	359
Ida.	-	-	t	+	1	326	0	0	t	+	t	+	9	2934
Wyo.	-	-	t	+	1.5	29	0	0	1	19	12.	234	17.9	348
*Colo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*N.Mex.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	-	-	7	26	-	-	-	-	-	-	30	112	41.1	153
*Utah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Nev.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wash.	-	-	t	+	-	-	-	-	t	+	-	-	10.	816
*Ore.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Calif.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Far West	-	-	-	26	-	355	-	-	-	38	-	346	-	4610
U.S.	3.3	10832	1.4	4634	0.6	2006	0.2	569	2.8	8930	0.1	346	18.2	59124

*Omitted from calculations for U. S. and section percentage loss.

Percentage of total listed production in States reporting:

U. S. 74, N.Atl. 91, N.Cent. 84, S.Atl. 84, S.Cent.30, Far West 46.

a/ Purple top.

TOMATOES: FOR MARKET

Table . Estimated reduction in yield from septoria blight (S. lycopersici), fusarium wilt (F. bulbigenum lycopersici), early blight and nail-head spot (Alternaria spp.), root knot (Heterodera marioni), fruit rots (various organisms).

State	Production: 1,000 bushels	Estimated reduction in yield due to disease									
		Septoria blight		Fusarium wilt		Early blight		Root knot		Fruit rots	
		%	1000 bu.	%	1000 bu.	%	1000 bu	%	1000 bu.	%	1000 bu.
Me.		-	-	-	-	t	+	-	-	t	+
Mass.		t	+	t	+	5.	+	-	-	-	-
Conn.		t	+	5.	+	10.	+	-	-	-	-
N. Y.	1,955	t	+	t	+	8	181	t	+	0.5	11
*N. J.	2,185	-	-	-	-	-	-	-	-	-	-
Pa.	452	0.5	3	t	+	8	44	-	-	2.	11
N. Atl.	4,592	0.1	3	t	+	8	225	t	+	0.8	22
Ohio	440	9	46	t	+	1.	5	-	-	3.	15
Ind.	567	20	185	0.5	5	10.	93	-	-	8	74
Ill.	116	t	+	1.	1	2.	2	-	-	3	4
Mich.	512	t	+	1	6	5	28	t	+	t	+
Wis.		10.	+	-	-	20	+	t	+	t	+
Minn.		2	+	t	+	-	-	-	-	-	-
Iowa	60	10	8	t	+	1	1	t	+	10	8
*Mo.	400	-	-	-	-	-	-	-	-	-	-
N.Dak.		-	-	t	+	-	-	0	0	2	+
Kan.		2	+	2	+	-	-	-	-	-	-
N.Cen.	2095	10.9	239	0.5	12	5.9	129	-	-	4.6	101
Del.	24	10	4	-	-	11	4	-	-	8	3
Md.	632	0.5	4	1.	8	3	23	-	-	8	62
Va.	312	1.	4	10	39	4	16	1.	4	-	-
W.Va.		t	+	1	+	t	+	-	-	t	+
N.C.	88	1.	1	4	5	0.5	1	5	6	5	6
*S.C.	350	-	-	-	-	-	-	-	-	-	-
*Ga.	330	-	-	-	-	-	-	-	-	-	-
Fla.	4948	-	-	-	-	-	-	-	-	-	-
S.Atl.	6684	0.2	13	0.8	52	0.7	44	-	10	1.1	71
*Ky.	207	-	-	-	-	-	-	-	-	-	-
*Tenn.	781	-	-	-	-	-	-	-	-	-	-
*Miss.	900	-	-	-	-	-	-	-	-	-	-
*Ark.	243	-	-	-	-	-	-	-	-	-	-
La.	216	-	-	1.5	.3	1.5	3	-	-	-	-
Okla.		t	+	3	+	2.	+	5	+	5	+
Tex.	3549	t	+	4	160	0.5	20	2	80	t	+
S.Cen.	5896	-	-	-	163	-	23	-	80	-	-
Mont.		0	0	t	+	0	0	0	0	2	+
Ida.		0	0	0	0	0	0	0	0	t	+
Wyo.		-	-	t	+	0	0	0	0	-	-
*Colo.	600	-	-	-	-	-	-	-	-	-	-
Ariz.		-	-	3	+	5.5	+	10	+	3	+
Utah	55	0	0	0	0	-	-	0	0	-	-
Wash.	364	0.2	1	-	-	0.3	1	-	-	-	-
Ore.	399	-	-	-	-	-	-	-	-	-	-
*Calif.	3900	-	-	-	-	-	-	-	-	-	-
Far Western	5318	-	1	-	-	-	1	-	-	-	-
U. S.	24,585	1.5	256	1.4	227	2.5	422	0.5	90	1.2	194

Table (cont'd.) Blossom-end rot (non-parasitic), bacterial canker (*Phytomonas michiganensis*), mosaic, curly top, and other virus diseases, and other diseases, 1939.

State	Estimated reduction in yield due to diseases											
	Blossom end rot		Bacterial canker		Virus diseases						All diseases	
					Mosaic		Curly top		Others			
	%	1000 bu.	%	1000 bu.	%	1000 bu	%	1000 bu	%	1000 bu	%	1000 bu.
Me.	-	-	-	-	-	-	0	0	-	-	t	+
Mass.	4.	+	0	0	-	-	0	0	4.	+	15.	+
Conn.	20.	+	-	-	-	-	0	0	0	0	35	+
N. Y.	3.	68	t	+	2.	45	0	0	t	+	13.5	305
*N. J.	-	-	-	-	-	-	0	0	0	0	-	-
Pa.	5.	27	0.5	3	1	5	0	0	t	+	17.	93
N. Atl.	3.4	95	0.1	3	1.8	50	0	0	t	+	14.2	398
Ohio	1	5	0.1	1	0.3	2	0	0	-	-	14.5	75
Ind.	-	-	t	+	t	+	0	0	t	+	38.8	360
Ill.	-	-	t	+	t	+	0	0	-	-	6.	7
Mich.	t	+	t	+	t	+	0	0	t	+	7	40
Wis.	t	+	t	+	t	+	0	0	t	+	30	+
Minn.	-	-	-	-	1.	+	0	0	t	+	4	+
Iowa	3	2	t	+	-	-	0	0	2	2	26	21
*Mo.	-	-	-	-	-	-	0	0	-	-	-	-
N. D.	1	+	-	-	1	+	0	0	-	-	4	+
Kan.	-	-	-	-	-	-	0	0	-	-	4	+
N. Cent.	0.3	7	t	+ 1	0.1	2	0	0	0.1	2	22.9	503
Del.	5	2	-	-	2	1	0	0	t	+	39	15
Md.	1.5	12	1	8	1	8	0	0	-	-	18	140
Va.	-	-	t	+	2	8	0	0	0	0	20	79
W. Va.	3	+	-	-	t	+	0	0	-	-	9	+
N. C.	2	2	-	-	-	-	0	0	-	-	27.5	32
*S. C.	-	-	-	-	-	-	0	0	-	-	-	-
*Ga.	-	-	-	-	-	-	0	0	-	-	-	-
Fla.	-	-	-	-	7	372	0	0	-	-	7.	372
S.Atl.	0.2	16	0.1	8	5.9	389	0	0	-	-	9.7	638
* Ky.	-	-	-	-	-	-	0	0	-	-	-	-
*Tenn.	-	-	-	-	-	-	0	0	-	-	-	-
*Miss.	-	-	-	-	-	-	0	0	-	-	-	-
*Ark.	-	-	-	-	-	-	0	0	-	-	-	-
La.	t	+	-	-	2.5	6	0	0	-	-	5.5	12
Okla.	3	+	t	+	3	+	0	0	t	+	22	+
Texas.	1	40	t	+	t	+	t	+	t	+	11.5	460
S.Cent.	-	40	-	-	-	6	t	+	-	-	-	472
Mont.	t	+	-	-	t	+	0	0	-	-	2	+
Ida.	t	+	0	0	t	+	5	+	t	+	5	+
Wyo.	-	-	-	-	-	-	-	-	-	-	t	+
*Colo.	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	10.	+	-	-	-	-	20.	+	-	-	52	+
Utah	-	-	6.4	4	1	1	1.9	1	-	-	20.6	a/ 14
Wash.	0.2	1	0.3	1	0.3	1	15	66	0.4	2	17	74
Ore.	-	-	-	-	--	-	5	21	-	-	5	21
* Calif.	-	-	-	-	-	-	-	-	-	-	-	-
Far West.	-	1	-	5	-	2	9.5	88	-	2	-	109
U. S.	0.9	159	0.1	17	2.7	449	0.5	88	t	4	12.6	2120

*Omitted from calculations for U. S. and section percentage loss.
Percentage of total listed production in States reporting: U.S. 60, N. Atl. 52, N. Cent. 81, S.Atl. 90, S. Cent. 64, Far West 15.

a/Verticillium wilt (*V. albo-atrum*), in Utah 11.3 percent, 7,797 bushels.

TOMATOES: FOR MANUFACTURE

Table . Estimated reduction in yield from septoria blight (S. lycopersici), fusarium wilt (F. bulbigenum lycopersici), early blight and nailhead spot (Alternaria solani and A. tomato), fruit rots due to various organisms.

State	Production short tons °	Estimated reduction in yield due to diseases							
		Septoria		Fusarium wilt		Early blight		Fruit rots	
		%	Short tons	%	Short tons	%	Short tons	%	Short tons
Conn.		t	+	5.	+	10.	+		
N. Y.	151,400	t	+	t	+	8	14002	0.5	875
*N. J.	197,300	-	-	-	-	-	-	-	-
Pa.	128,800	0.5	776	t	+	8.	12414	2.	3104
N. Atl.	477,500	0.2	776	t	+	8.	26416	1.2	3979
Ohio	178,600	9.	18800	t	+	1.	2089	3	6267
Ind.	347,000	20.	113399	0.5	2835	10.	56699	8.	45359
Ill.	38,300	t	+	1.	407	2.	815	3.	1222
Mich.	36,300	t	+	1.	390	5.	1952	t	+
Wis.		10.	+	-	-	20.	+	t	+
Minn.		2.	+	t	+	-	-	-	-
I. .	21,100	10.	2871	t	+	1.	287	10.	2871
*Mo.	16,200	-	-	-	-	-	-	-	-
Kan.		2.	+	2.	+	-	-	-	-
N. Cent.	637,500	15.3	135,070	0.4	3632	7.0	61842	6.3	55719
Del.	33,500	10.	5,492	-	-	11.	6041	8	4393
Md.	205,200	0.5	1,251	1.	2502	3.	7507	8.	20020
Va.	57,400	1.	718	10.	7175	4.	2870	-	-
W. Va.		t	+	1.	+	t	+	t	+
N. C.		1.	+	4.	+	0.5	+	5.	+
Fla.		-	-	-	-	-	-	-	-
S. Atl.	296,100	2.	7,461	2.6	9677	4.4	16418	6.5	24413
*Ky.	6,500	-	-	-	-	-	-	-	-
*Tenn.	8,500	-	-	-	-	-	-	-	-
Ark.	14,400	-	-	-	-	-	-	-	-
La.		-	-	1.5	+	1.5	+	-	-
Okla.		t	+	3	+	2.	+	5.	+
Texas		t	+	4	+	0.5	+	t	+
S. Cen.	29,400	-	-	-	-	-	-	-	-
Idaho		0	0	0	0	0	0	t	+
*Colo	16,500	-	-	-	-	-	-	-	-
Utah	60,800	-	-	t	+	-	-	-	-
Wash.		0.2	+	-	-	0.3	+	-	-
Ore.		-	-	-	-	-	-	-	-
*Calif.	329,500								
Far Western	406,800	-	-	-	-	-	-	-	-
**+Other States	78,200	-	-	-	-	-	-	-	-
U. S.	1,925,500	8.5	143307	0.8	13309	6.2	104676	5.	84111

TOMATOES: FOR MANUFACTURE (Continued)

Table (Cont'd.) Blossom-end rot (non-par.), bacterial canker (*Phytomonas michiganensis*), virus diseases[a/], and other diseases, 1939.

State	Estimated reduction in yield due to disease							
	Blossom-end rot		Bacterial canker		Virus diseases [a/]		All diseases	
	%	Short tons	%	Short tons	%	Short tons	%	Short tons
Connecticut	20.	+					35.	+
New York	3.	5251	t	+	2.	3501	13.5	23629
*New Jersey	-	-	-	-	-	-	-	-
Pennsylvania	5.	7759	0.5	776	1.	1552	17.	26381
N. Atlantic	3.9	13010	0.2	776	1.5	5053	15.1	50010
Ohio	1.	2089	0.1	209	0.3	627	14.5	30290
Indiana	-	-	t	+	t	+	33.8	219993
Illinois	-	-	t	+	t	+	6.	2444
Michigan	t	+	t	+	t	+	7.	2732
Wisconsin	t	+	t	+	t	+	30.	+
Minnesota	-	-	-	-	1.	+	4.	+
Iowa	3.	861	t	+	2.	574	26.5	7608
*Missouri	-	-	-	-	-	-	-	-
Kansas	-	-	-	-	-	-	4.	+
N. Central	0.3	2950	t	209	0.1	1201	29.7	263067
Delaware	5.	2746	-	-	2.	1098	39.[b/]	21418
Maryland	1.5	3754	1.	2502	1.	2502	18	45043
Virginia	-	-	t	+	2.	1435	20	14351
West Virginia	3	+	-	-	t	+	9	+
North Carolina	2	+	-	-	-	-	27.5	+
Florida	-	-	-	-	7.	+	7.	+
S. Atlantic	1.7	6500	0.7	2502	1.3	5035	21.5	80812
*Kentucky	-	-	-	-	-	-	-	-
*Tennessee	-	-	-	-	-	-	-	-
Arkansas	10.	1600	-	-	-	-	10.	1600
Louisiana	t	+	-	-	2.5	+	5.5	+
Oklahoma	3	+	t	+	3	+	22	+
Texas	1	+	t	+	t	+	11.5	+
S. Central	-	1600	-	-	-	-	-	1600
Idaho	t	+	0	0	5.	+	5.	+
*Colorado	-	-	-	-	-	-	-	-
Utah	1	776	6.4	4963	2.9	2249	21.6[b/]	16751
Washington	0.2	+	0.3	+	15.7	+	17.[b/]	+
Oregon	-	-	-	-	5.	+	5	+
*California	-	-	-	-	-	-	-	-
Far Western	-	776	-	4963	-	2249	-	16751
*+Other States								
United States	1.5	24836	0.5	8450	0.8	13538	24.5	412240

° Short tons, 2000 pounds

*Omitted from calculations for U. S. and section percentage loss. Percentage of total listed production in States reporting: U. S. 66, N. Atl. 59, N. Cent. 97, S. Atl. 100, S. Cent. 49, Far West 15.

+Include Ala., Conn., Fla., Ga., Ida., Kan., La., Minn., Miss., Neb., New Mexico, N. C., Okla., Ore., S. C., Texas, Wash., W. Va., and Wis.

a/ Except in the Far West, mosaic, except traces of streak in N. Y., Pa., Wis., Okla., and Tex., traces of spotted wilt in Mich., Del., and Texas, and trace of curly top in Texas. In the Far West, curly top except mosaic, trace in Idaho, 1% in Utah, 0.3% in Wash.; spotted wilt, 0.2% in Wash.; streak, trace in Idaho, 0.2% in Wash.

b/ Verticillium wilt (V. albo-atrum): Del. 1 %, 549 short tons; Utah 11.3%, 8763 short tons; Wash. 0.3%.

GREEN BEANS

Table . Reduction in yield from anthracnose (Colletotrichum lindemuthianum), bacterial blights (Phytomonas spp.), virus diseases (mostly mosaic), rust (Uromyces phaseoli typica), powdery mildew (Erysiphe polygoni), and other diseases, 1939.

State	Production 1000 bu.	Estimated reduction in yield due to disease: Bacterial blights: Common %	Common 1000 bu.	Halo %	Halo 1000 bu.	Virus[a] diseases %	Virus diseases 1000 bu.	Root rots %	Root rots 1000 bu.	Rust %	Rust 1000 bu.	Powdery mildew %	Powdery mildew 1000 bu.	All diseases %	All diseases 1000 bu.
*Maine	173	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass.		2.	+	-	-	0.5	+	2.	+	t	+	t	+	5.	+
N. Y.	1468	t	+	2.	31	2.	31	1.	15	t	+	t	+	5.	77
*N. J.	1196	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	802	0.5	4	t	+	2.	18	5	44	t	+	t	+	9.5	84
Ohio		1	+	-	-	-	-	1.	+	-	-	2.	+	5.	+
*Ind.	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ill.	60	3	2	+	+	-	-	t	+	t	+	-	-	3.	2
*Mich.	559	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wis.	760	1	8	1.	8	1.	8	t	+	t	+	0	0	3.	24
Minn.		4.	+	+	+	-	-	-	-	-	-	-	-	4.	+
Iowa		6.	+	+	+	1.	+	0.1	+	-	-	-	-	8.1	+
N.Dak.		t	+	+	+	2.5	+	-	-	0	0	0	0	2.5	+
Del.	58	2.	1	-	-	t	+	1.	1	-	-	-	-	6.	4
Md.	1235	3.	42	+	+	0.5	7	4.	56	t	+	t	+	12.	168
Va.	778	1.	11	8	92	0.	0	3.	34	10	114	10.	114	32.	365
W. Va.		3.	+	+	+	2.	+	t	+	-	-	t	+	7.	+
N. C.	1122	-	-	2	26	2	26	3.	39	2.	26	2.	26	13	169
*S. C.	591	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ga.	525	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Fla.	7135	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Miss.	499	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Ark.	232	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La.	768	5.	42	+	+	-	-	t	+	-	-	-	-	9.	76
Okla.		4.	+	1	+	5	+	-	-	t	+	t	+	10.	+
Texas	253	t	+	+	+	1.	3	t	+	t	+	1.	3	2.	6
Mont.		t	+	t	+	1.	+	0	0	t	+	0	0	1.	+
Idaho		0	0	t	+	0	0	0	0	-	-	-	-	t	+
Wyo.		1.	+	2.	+	0.2	+	0	0	-	-	-	-	3.2	+
*Colo.	626	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Utah	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wash.	280	-	-	t	+	2.	6	t	+	t	+	-	-	2.	6
*Ore.	587	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Calif.	1740	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other States	627	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U. S.	22,627	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data not sufficient to calculate U. S. percentage loss.
Percentage of total listed production in States reporting. 36.

DRY BEANS

Table . Reduction in yield from bacterial blights (Phytomonas spp.), virus diseases, root rots (various organisms), and other diseases, 1939.

State	Production**	Estimated reduction in yield due to diseases									
		Bacterial blights				Virus diseases[a/]		Root rots		All diseases	
		Common		Halo							
	1,000 bags°	%	1000 bags	%	1000 bags	%	1000 bags	%	1000 bags	%	1000 bags
*Maine	100	-	-	-	-	-	-	-	-	-	-
Vt.	18	t	+	-	-	-	-	-	-	t	+
N. Y.	1134	t	+	2.	24	0.5	6	3.	36	5.5	66
Mich.	4520	2.	93	0.5	23	0.1	5	0.2	9	3.3	153
Wis.	9	1.	+	1.	+	1.	+	t	+	3.	+
Minn.	9	4	+	+	+	-		-		4.	+
*Neb.	154	-	-	-	-	-	-	-	-	-	-
Del.		1.	+	-	-	5.	+	1.	+	8.	+
Okla.		3.	+	-	-	5.	+	1.	+	11.	+
Mont.	207	t	+	t	+	3.	6	0.	0.	3	6
Ida.	1551	0	0	t	+	7	117	t	+	7	117
Wyo.	460	0.5	2.	1.	5	-	-	-	-	1.5	7
*Colo.	1360	-	-	-	-	-	-	-	-	-	-
*N. M.	409	-	-	-	-	-	-	-	-	-	-
*Ariz.	23	-	-	-	-	-	-	-	-	-	-
*Ore.	18	-	-	-	-	-	-	-	-	-	-
*Calif.	3990	-	-	-	-	-	-	-	-	-	-
U. S.	13962	1.2	95	0.6	52	1.6	134	0.5	45	4.2	349

*Omitted from calculations for U. S. percentage loss

Percentage of total listed production in States reporting, 57.

a/ Mosaic, except Idaho, mosaic 5%, curly top, 2%.

**Includes beans grown for seed.

°Bags of 100 pounds.

GREEN PEAS FOR MANUFACTURE

Table . Estimated reduction in yield from wilt and near wilt (*Fusarium* spp.), ascochyta blights (*Mycosphaerella pinodes* and *Ascochyta* spp.), root and stem rots caused by various organisms, virus diseases, and other diseases, 1939.

State	Production short tons	Wilt and near wilt %	Wilt and near wilt Short tons	Ascochyta blights %	Ascochyta blights Short tons	Root and stem rots %	Root and stem rots Short tons	Virus diseases %	Virus diseases Short tons	All diseases %	All diseases Short tons
*Maine	3780	-	-	-	-	-	-	-	-	-	-
N. Y.	19820	t	+	t	+	10.	2493	10.5	2618	20.5	5111
Pa.	3220	0.5	18	t	+	9.	320	t	+	9.5	338
Ohio	2050	-	-	-	-	5.	110	-	-	7.	154
*Ind.	3750	-	-	-	-	-	-	-	-	-	-
Ill.	11600	t	+	-	-	1.	117	-	-	1.	117
Mich.	5840	-	-	0.1	6	0.3	18	0.1	6	0.7	42
Wis.	50200	3.	1585	-	-	1.	528	t	+	5.	2641
Minn.	17650	-	-	-	-	-	-	-	-	4 b/	735
Iowa	960	-	-	-	-	4.	40	-	-	4	40
Del.	850	-	-	-	-	5.	48	5	48	11	106
Md.	8820	0.3	28	t	+	3	276	-	-	4.3	396
*Va.	1670	-	-	-	-	-	-	-	-	-	-
Okla.		1.	+	-	-	2.	+	1	+	5	+
Mont.		0	0	t	+	3.	+	0	0	3	+
Idaho		t	+	0	0	2.	+	t	+	2	+
*Colo.	2630	-	-	-	-	-	-	-	-	-	-
*Utah	11880	-	-	-	-	-	-	-	-	-	-
Wash.	23000	0.8	194	1.	242	1.2	291	0.8	194	5	1212
Ore.	15840	8.	2112	10.	2640	2.	528	7.	1848	40.	10560
*Calif.	2750		-	-	-	-	-	-	-	-	-
*Other States	7640										
U. S.	193950	2.2	3937	1.6	2888	2.6	4769	2.6	4714	11.8	21452

*Omitted from calculations for U. S. percentage loss.

Percentage of total listed production in States reporting, 82.

a/ Mosaic, except streak 0.5% in N. Y., t. in Idaho, 0.4% in Wash.

b/ Bacterial blight (*Phytomonas pisi*)

GREEN PEAS FOR MARKET

Table . Estimated reduction in yield from wilt and near wilt (<u>Fusarium</u> spp.), ascochyta blights (<u>Mycosphaerella pinodes</u> and <u>Ascochyta</u> spp.), root and stem rots caused by various organisms, virus diseases, and other diseases, 1939.

State	Production	Estimated reduction in yield due to disease									
		Wilt and near wilt		Ascochyta blights		Root and stem rots		Virus diseases		All diseases	
	1000 °bushels	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.
Vt.		-	-	-	-	t	+	-	-	t	+
Mass.		-	-	-	-	25.	+	+	+	25.	+
N. Y.	556	t	+	t	+	10.	70	10.5	73	20.5	143
*N. J.	108	-	-	-	-	-	-	-	-	-	-
Pa.		0.5	+	t	+	9.	+	t	+	9.5	+
Ohio		-	-	-	-	5.	+	-	-	7.	+
Ill.		t	+	-	-	1.	+	-	-	1.	+
Mich.		-	-	0.1	+	0.3	+	0.1	+	0.7	+
Wis.		2	+	-	-	1.	+	t	+	5.	+
Minn.		-	-	-	-	-	-	-	-	4.	+
Iowa		-	-	-	-	4.	+	-	-	4.	+
Del.		-	-	-	-	5.	+	5.	+	11.	+
Md.	8	0.3	+	t	+	3.	+	-	-	4.3	+
*Va.	195	-	-	-	-	-	-	-	-	-	-
N. C.	144	1.	2	1.	2	3.	5	-	-	8.	14
*S. C.	161	-	-	-	-	-	-	-	-	-	-
*Fla.	350	-	-	-	-	-	-	-	-	-	-
*Miss.	135	-	-	-	-	-	-	-	-	-	-
La.	62	-	-	3.	3	-	-	-	-	3.	3
Okla.		1.	+	-	-	2.	+	1.	+	5.	+
*Texas	252	-	-	-	-	-	-	-	-	-	-
Mont.		0	0	t	+	3.	+	0	0	3.	+
Ida.	593	t	+	0	0	2.	12	t	+	2	12
*Colo.	1188	-	-	-	-	-	-	-	-	-	-
*N.Mex.	59	-	-	-	-	-	-	-	-	-	-
*Ariz.	56	-	-	-	-	-	-	-	-	-	-
*Utah	210	-	-	-	-	-	-	-	-	-	-
Wash.	825	0.8	7	1.	9	1.2	10	0.8	9	5.	45
Ore.	102	8	14	10	17	2	3	7	12	40.	68
*Calif.	4623	-	-	-	-	-	-	-	-	-	-
U. S.	9627										

°Bushels of 30 pounds.
Data not sufficient to calculate U. S. percentage.
Percentage of total listed production in States reporting, 24.

Table . Estimated reduction in yield due to curly top (virus), leaf spot (*Cercospora beticola*), root rots (various organisms), damping-off (various organisms), and other diseases, 1939.

State	Production 1000 short tons	Curly top %	Curly top 1,000 tons	Leaf spot %	Leaf spot 1,000 tons	Root rots %	Root rots 1,000 tons	Damping-off %	Damping-off 1,000 tons	All diseases %	All diseases 1,000 tons
Pa.		0	0	t	+	-	-	1.	+	1.	+
Ohio	1369	0	0	9.	152	10.	169	-	-	19.	321
Mich.	24	0	0	15.	4	t	+	t	+	15	4
Wis.		0	0	0.5	+	t	+	t	+	2.5	+
Iowa		0	0	5.1	+	3.5	+	3.	+	11.8	+
*Neb.	789	0	0	-	-	-	-	-	-	-	-
Mont.	891	t	+	-	-	3.	30	5	50	11.	110
Idaho	972	1.	10	0.	0	t	+	1.	10	2	20
Wyo.	541	-	-	t	+	t	+	-	-	t	+
*Colo.	1539	-	-	-	-	-	-	-	-	-	-
Ariz.		1.7	+	-	-	-	-	3.	+	4.7	+
*Utah	694	-	-	-	-	-	-	-	-	-	-
Wash.		3.	+	0.5	+	1.	+	-	-	5	+
Ore.		5.	+	-	+	-	-	-	-	5.	+
Calif.	2628	-	-	-	-	0.5	13	t	+	1.5	40
*Other states	1244										
U. S.	10691	0.1	10	2.3	156	3.1	212	0.9	60	7.2	495

*Omitted from calculations for U. S. percentage loss.
Percentage of total listed production in States reporting, 60.

Table . Estimated reduction in yield due to anthracnose (Glomerella gossypii), angular leaf spot (Phytomonas malvacearum), fusarium wilt (Fusarium vasinfectum), root knot (Heterodera marioni), cotton root rot (Phymatotrichum omnivorum), seedling blights (various organisms), deficiency diseases, and other diseases, 1939.

State	Production	Estimated reduction in yield due to diseases															
		Anthracnose		Angular leaf spot		Wilt		Root knot		Root rot		Seedling blights		Deficiency diseases		All diseases	
	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales	%	1,000 bales
*Mo.	440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Va.	12	17	2	2.	+	t	+	´	+	0	0	5.	1	3.	+	27.	4
N. C.	455	3	18	2.	12	9.	55	2.	12	0	0	5.	31	5.	31	26.	159
*S. C.	870	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Ga.	916	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Fla.	11	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Tenn.	450	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Ala.	780	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
*Miss.	1585	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
Ark.	1410	t	+	1.	16	4.	63	1.	16	t	+	2.	31	2	31	10	157
La.	750	2.	18	1.	9	6	55	1.	9	0	0	1.5	14	6	55	17.5	160
Okla.	520	t	+	5.	33	1.	7	1.	7	2.	13	3	20	10.	67	22	147
Texas	2830	-	-	2.6	83	1.6	51	0.2	6	6.8	218	0.5	16	t	+	11.8	377
*N.Mex.	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	197	-	-	2.	5	-	-	1.	2	5.	12	-	-	-	-	20.	49
*Calif.	450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* All Others	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U. S.	11792	0.5	38	2.2	158	3.2	231	0.7	52	3.3	243	1.6	113	2.5	184	14.5	1053

* Omitted from calculations for U. S. percentage loss.
Percentage of total listed production in States reporting, 52.

Tobacco . Estimated reduction in yield due to downy mildew (Peronospora tabacina), black root rot (Thielaviopsis basicola), mosaic (virus), bacterial leaf spots (Phytomonas spp.), deficiency diseases, and other diseases, 1939.

State	Production 1,000 pounds	Downy mildew %	Downy mildew 1,000 pounds	Black root rot %	Black root rot 1,000 pounds	Mosaic %	Mosaic 1,000 pounds	Bacterial leaf spots %	Bacterial leaf spots 1,000 pounds	Deficiency diseases %	Deficiency diseases 1,000 pounds	All diseases %	All diseases 1,000 pounds
Mass.	9920	0.2	22	0.2	22	7.	763	0.4	44	-	-	9.	982
*Conn.	25590	-	-	-	-	-	-	-	-	-	-	-	-
*N. Y.	2025	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	36239	t	+	t	+	1.5	628	12.	5027	t	+	13.5	5655
Ohio	28842	t	+	t	+	-	-	t	+	-	-	1.	291
*Ind.	10198	-	-	-	-	-	-	-	-	-	-	-	-
Wis.	31406	0	0	1.	320	t	+	-	-	-	-	2.	640
*Minn.	840	0	0	-	-	-	-	-	-	-	-	-	-
*Mo.	6012	0	0	-	-	-	-	-	-	-	-	-	-
*Kan.	510	0	0	-	-	-	-	-	-	-	-	-	-
Md.	29796	5.	1992	0.7	279	6.	2390	3.	1195	2.	797	25.2	10039
*Va.	138232	-	-	-	-	-	-	-	-	-	-	-	-
W. Va.	2175	-	-	5.	117	-	-	-	-	-	-	7.	164
N. C.	773810	3.	32468	t	+	3.	32468	1.	10823	4.	43290	28.5[a]	303443
*S. C.	130200	-	-	-	-	-	-	-	-	-	-	-	-
Ga.	96620	1.	1050	-	-	0	0	0	0	t	+	8.[b]	8401
*Fla.	23410	-	-	-	-	-	-	-	-	-	-	-	-
*Ky.	320668	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	102716	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	430	-	-	-	-	-	-	-	-	-	-	-	-
U. S.	1769639	2.6	35532	t	738	2.7	36249	1.3	17089	3.3	44087	24.9	334615

*Omitted in calculations for U. S. percentage loss.
Percentage of total listed production in States reporting, 57.
[a] Other diseases include root knot and bacterial wilt, each 7%, 75,758,000 pounds.
[b] Other diseases include root knot, 5.5%, 5,776,000 pounds.

Table . Estimated reduction in yield due to blight (Erwinia amylovora), scab (Venturia pyrina), leaf blight (Fabraea maculata), and other diseases, 1939.

State	Production 1,000 bu.	Blight %	Blight 1,000 bu.	Scab %	Scab 1,000 bu.	Leaf blight %	Leaf blight 1,000 bu.	All diseases %	All diseases 1,000 bu.
*Maine	13	-	-	-	-	-	-	-	-
*N. H.	11	-	-	-	-	-	-	-	-
*Vermont	7	-	-	-	-	-	-	-	-
Mass.	53	1.	1	t	+	-	-	1.	1
*R. I.	8	-	-	-	-	-	-	-	-
*Conn.	43	-	-	-	-	-	-	-	-
New York	1749	t	+	t	+	t	+	t	+
*New Jersey	52	-	-	-	-	-	-	-	-
Pa.	918	13.	138	0.5	5	t	+	13.5	143
N. Atlantic	2854	4.9	139	0.2	5	t	+	5.1	144
Ohio	956	8.	84	1.	11	-	-	9	95
*Indiana	527	-	-	-	-	-	-	-	-
Illinois	724	1.	7	0	0	1.	7	2	14
Michigan	1354	5.	71	t	+	t	+	5	71
Wisconsin		1.5	+	12.	+	t	+	13.5	+
Iowa	139	3.	4	0	0	-	-	3.	4
Missouri	426	0.1	+	-	-	0.1	+	0.2	1
*Nebraska	55	-	-	-	-	-	-	-	-
*Kansas	151	-	-	-	-	-	-	-	-
N. Central	4332	4.4	166	0.3	11	0.2	7	4.9	185
Delaware	9	5.	+	2.	+	5.	+	12.	1
Maryland	81	12.	12	2	2	1.8	2	15.8	16
Virginia	189	3	6	t	+	t	+	3	6
West Virginia	56	t	+	-	-	-	-	t	+
N. C.	230	10.	32	-	-	15.	47	27.	85
*S. C.	104	-	-	-	-	-	-	-	-
Georgia	281	10	31	-	-	-	-	10.	31
*Florida	69	-	-	-	-	-	-	-	-
S. Atlantic	1019	8.2	81	0.2	2	5.0	49	14.1	139
*Kentucky	206	-	-	-	-	-	-	-	-
*Tennessee	244	-	-	-	-	-	-	-	-
*Alabama	313	-	-	-	-	-	-	-	-
*Missouri	348	-	-	-	-	-	-	-	-
*Arkansas	211	-	-	-	-	-	-	-	-
*Louisiana	130	-	-	-	-	-	-	-	-
Oklahoma	92	3.	3	-	-	1.	1	4.	4
Texas	406	0.5	2	-	-	-	-	1.5	6
S. Central	1950	-	5	-	-	-	-	-	10
Idaho	62	t	+	0	0	0	0	8.	5
*Colo.	188	-	-	-	-	-	-	-	-
*N. Mex.	45	-	-	-	-	-	-	-	-
Ariz.	11	15	2	-	-	-	-	15.	2
*Utah	104	-	-	-	-	-	-	-	-
*Nev.	3	-	-	-	-	-	-	-	-
Washington	5779	0.2	12	0.2	12	-	-	4.	241
*Oregon	4229	-	-	-	-	-	-	-	-
*California	10334	-	-	-	-	-	-	-	-
Far Western	20755	-	14	-	12	-	-	-	248
U. S.	30910	2.8	405	0.2	30	0.4	57	5.1	726

*Omitted from calculations for U. S. and section percentage loss.
Percentage of total listed production in States reporting: U. S. 44, N. Atl. 95, N. Cent. 83, S. Atl. 83, S. Cent. 26, Far West 28.

APPLE

Table . Estimated reduction in yield due to bitter rot (Glomerella cingulata), black rot (Physalospora obtusa), blotch (Phyllosticta solitaria), cedar rust (Gymnosporangium spp.) blight (Erwinia amylovora), scab (Venturia inaequalis), and other diseases, 1939.

State	Production	Estimated reduction in yield due to diseases													
		Bitter rot		Black rot		Blotch		Rusts		Blight		Scab		All diseases	
	1,000 bushels	%	1,000 bu.	%	1,000 bu.	%	1,000 bu.	%	1,000 bu.	%	1,000 bu.	%	1,000 bu.	%	1,000 bu.
Maine	900	3.	31	-	-	0	0	0.2	2	0.3	3	10.	105	14.	146
*N. H.	890	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vt.	810	-	-	-	-	t	+	t	+	t	+	10	92	12	110
Mass.	2420	t	+	t	+	-	-	0.5	14	0.1	3	6	168	13.8	387
*R. I.	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	1030	-	-	-	-	-	-	0.5	6	-	-	10	115	10.5	121
New York	14500	t	+	t	+	t	+	t	+	t	+	0.5	73	0.5	73
*New Jersey	2950	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	6100	t	+	1.5	111	0.5	37	0.5	37	2.	148	10.	739	17.5	1294
N. Atlantic	29850	0.1	31	0.4	111	0.1	37	0.2	59	0.6	154	4.6	1292	7.6	2131
Ohio	5800	0.5	32	0.1	6	0.2	13	1.	65	0.5	32	8	518	10.4	672
Indiana	1250	0.5	7	-	-	0.1	1	0.1	1	0.1	1	13.	193	15.9	234
Illinois	4700	1.	55	t	+	1.5	82	0.5	27	1.	55	8	437	14.	765
Michigan	7800	-	-	t	+	t	+	t	+	2.	168	5	419	7	587
Wisconsin	500	0	0	0.1	1	0.1	1	0.5	3	2.	13	20	130	23.	150
Minnesota	175	0	0	-	-	0.	0	3.	6	2.	4	5	10	11	22
Iowa	260	0.1	+	2.5	8	0.5	2	1.	3	3.	9	7.5	23	15.7	48
Missouri	1400	0.1	1	0.1	1	0.1	1	0.3	4	0.1	1	2.5	36	3.3	45
N. Dak.		-	-	-	-	-	-	-	-	2	+	t	+	2.	+
*Nebraska	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Kansas	770	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N. Central	22905	0.4	95	t	16	0.4	100	0.4	109	1.2	283	7.2	1766	10.3	2523
Delaware	1750	3.	60	3.	60	t	+	1.	20	2.	40	2.	40	13.	260
Maryland	1700	1.	21	1.	21	0.5	10	2	41	1.6	33	7.	145	17.	373
Virginia	7500	3.	242	0.2	16	t	+	1.1	89	0.2	16	2.5	202	7.1	573
W. Virginia	1000	0.5	22	0.1	4	0.1	4	0.1	4	0.1	4	4	174	8	347

APPLE (Continued)

State	Production 1,000 bushels	Bitter rot %	Bitter rot 1,000 bu.	Black rot %	Black rot 1,000 bu.	Blotch %	Blotch 1,000 bu.	Rusts %	Rusts 1,000 bu.	Blight %	Blight 1,000 bu.	Scab %	Scab 1,000 bu.	All diseases %	All diseases 1,000 bu.
		Estimated reduction in yield due to diseases													
N. C.	580	2.	14	1.	7	1.	7	1.	7	5.	35	6.	42	18.	126
Georgia	450	5.	26	-	-	-	-	-	-	2.	10	5.	26	12.	62
S. Atlantic	15980	2.2	385	0.6	108	0.1	21	0.9	161	0.8	138	3.5	629	9.8	1741
*Kentucky	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Tennessee	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Arkansas	625	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oklahoma	55	1.	1	1.	1	4.	2	t	+	1.	1	1.	1	8.	6
S. Central	1210	-	1	-	1	-	2	-	-	-	1	-	1	-	6.
Montana	320	0	0	-	-	0	0	-	-	t	+	0.5	2	0.5	2
Idaho	2150	0	0	-	-	0	0	-	-	t	+	t	+	1.	22
Wyoming		0	0	-	-	0	0	-	-	2.	+	-	-	2.	+
*Colorado	1100	0	0	-	-	0	0	-	-	-	-	-	-	-	-
*New Mexico	580	0	0	-	-	0	0	-	-	-	-	-	-	-	-
Arizona	35	0	0	-	-	0	0	-	-	2.	1	-	-	7.	3
*Utah	300	0	0	-	-	0	0	-	-	-	-	-	-	-	-
Washington	19500	0	0	-	-	0	0	-	-	0.8	163	0.4	81	4.	813
*Oregon	2000	0	0	-	-	0	0	-	-	-	-	-	-	-	-
*California	4354	0	0	-	-	0	0	-	-	-	-	-	-	-	-
Far Western	30339	0	0	-	-	0	0	-	-	0.7	164	0.4	83	3.7	840
U. S.	100284	0.6	512	0.3	236	0.2	160	0.4	329	0.8	740	4.1	3771	8.0	7241

+ Commercial production.

* Omitted from calculations for U. S. and section percentage loss.

Percentage of total listed production in States reporting: U. S. 85, N. Atl. 86, N. Cent. 96, S. Atl. 100, S. Cent. 5, Far West 73.

PEACH

Table . Estimated reduction in yield due to leaf curl (Taphrina deformans), brown rot (Sclerotinia spp.) scab (Cladosporium carpophilum), bacterial spot (Phytomonas pruni) virus diseases and other diseases, 1939 .

State	Production	Estimated reduction in yield due to diseases											
		Leaf curl		Brown rot		Scab		Bacterial spot		Virus diseases		All diseases	
	1,000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.	%	1000 bu.
*N. H.	17	-	-	-	-	-	-	-	-	-	-	-	-
Mass.	74	t	+	0.5	+	0.5	+	t	+	16.	14	17.	15
*R. I.	12	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	84	-	-	2.	2	-	-	-	-	10.	10	12.	12
N. Y.	1722	t	+	t	+	t	+	t	+	t	+	t	+
*N. J.	1435	-	-	-	-	-	-	-	-	-	-	-	-
Pa.	2618	1.	31	10.	308	3.	93	t	+	0.1	3	15.1	466
Ohio	1212	1.	13	5.	66	2.	27	0.5	7	-	-	8.5	113
Ind.	378	1.	4	2	8	0.1	+	-	-	-	-	3.1	12
Ill.	2057	t	+	3.	68	1.	23	5.	113	-	-	9.	204
Mich.	2760	t	+	5.	147	t	+	t	+	t	+	6.	176
Iowa	110	3.	4	8.	10	2.	3	0.1	+	-	-	13.2	17
Mo.	1140	0.1	1	0.5	6	-	-	-	-	-	-	0.6	7
*Neb.	70	-	-	-	-	-	-	-	-	-	-	-	-
*Kan.	154	-	-	-	-	-	-	-	-	-	-	-	-
Del.	422	5.	23	1.	5	1.	5	1.	5	t	+	8.	38
Md.	427	3.	15	3.5	17	3.	15	1.5	7	1.	5	12.2	60
Va.	990	1.	10	3.5	36	t	+	t	+	t	+	5	51
W.Va.	315	t	+	1.	3	-	-	-	-	-	-	2	6
N.C.	1395	0.5	8	7.	113	2.	32	2.	32	-	-	13.5	217
*S.C.	1484	-	-	-	-	-	-	-	-	-	-	-	-
Ga.	4290	0	0	1.	52	1.	52	10.	517	5.	258	17.	879
*Fla.	33	-	-	-	-	-	-	-	-	-	-	-	-
*Ky.	562	-	-	-	-	-	-	-	-	-	-	-	-
*Tenn.	1798	-	-	-	-	-	-	-	-	-	-	-	-
*Ala.	1705	-	-	-	-	-	-	-	-	-	-	-	-
*Miss.	1034	-	-	-	-	-	-	-	-	-	-	-	-
*Ark.	2709	-	-	-	-	-	-	-	-	-	-	-	-
*La.	409	-	-	-	-	-	-	-	-	-	-	-	-
Okla.	615	1.	7	5.	35	1.	7	4.	28	0.5	3	11.5	80
Texas	1972	t	+	t	+	0.5	10	t	+	-	-	0.5	10
Idaho	146	t	+	0.	0	0	0	0	0	-	-	15.5 b/	27
*Colo.	1575	-	-	-	-	-	-	-	-	-	-	-	-
*N. M.	73	-	-	-	-	-	-	-	-	-	-	-	-
Ariz.	51	-	-	-	-	-	-	-	-	25.	23	45. c/	42
*Utah	564	-	-	-	-	-	-	-	-	-	-	-	-
*Nev.	6	-	-	-	-	-	-	-	-	-	-	-	-
Wash.	1210	0.5	6	0.5	6	0.4	5	-	-	-	-	3.	37
*Ore.	391	-	-	-	-	-	-	-	-	-	-	-	-
*Calif.	23711	-	-	-	-	-	-	-	-	-	-	-	-
U. S.	61730	0.5	122	3.3	882	1.	272	2.7	709	1.2	316	9.3	2469

*Omitted in calculations for U. S. percentage loss.
Percentage of total listed production in States reporting, 39.
a/Brown rot: all S. fructicola except on the Pacific Coast where both S. fructicola and S. laxa occur.
b/Including chlorosis, Rhizopus rot.
c/Phymatotrichum 10%, root knot 10%.

CHERRY

Table . Estimated reduction in yield due to brown rot (*Sclerotinia fructicola*, *S. laxa*), leaf spot (*Coccomyces hiemalis*), and other diseases, 1939.

State	Production tons	Brown rot %	Brown rot Tons	Leaf spot %	Leaf spot Tons	All diseases %	All diseases Tons
Massachusetts		5.	+	t	+	5.	+
New York	27210	t	+	t	+	t	+
Pennsylvania	12170	3.5	485	8.5	1177	12.1	1676
Ohio	8860	-	-	12.	1208	12.	1208
Indiana		-	-	5.	+	5.	+
Illinois		1.	+	1	+	2	+
Michigan	35280	2	850	15.	6376	17	7226.
Wisconsin	8350	t	+	10.	928	10	928
Iowa		5	+	12.	+	17.1	+
Missouri		-	-	0.1	+	0.1	+
Maryland		4	+	3.	+	9.1	+
Virginia		10	+	5.	+	15.	+
West Virginia		t	+	-	-	t	+
North Carolina		5.	+	2.	+	7.	+
Oklahoma		4.	+	2.	+	9	+
*Montana	360	-	-	-	-	-	-
Idaho	1800	0	0	0	0	6.	115
*Colorado	3920	-	-	-	-	-	-
*Utah	2130	-	-	-	-	-	-
Washington	26800	0.7	193	0.8	221	3.	828
Oregon	24100	2.	505	1.	252	4.5	1136
*California	33600	-	-	-	-	-	-
Twelve States	184580	1.3	2033	6.4	10162	8.3	13117

[a] Brown rot, all *S. fructicola*, except on the Pacific Coast where both species occur.

STRAWBERRY

Table . Estimated reduction in yield from leaf spot (Mycosphaerella fragariae), leaf scorch (Diplocarpon earliana), root diseases due to various causes, fruit rots (various organisms), and other diseases, 1939.

State	Production 1,000 crates	Leaf spot %	Leaf spot 1,000 crates°	Leaf scorch %	Leaf scorch 1,000 crates	Root diseases a/ %	Root diseases a/ 1,000 crates	Fruit rots %	Fruit rots 1,000 crates	All diseases %	All diseases 1,000 crates
Maine		5.	+	-	-	3.	+	t	+	13.	+
Vt.		5.	+	-	-	-	-	5.	+	10.	+
Mass.		0.5	+	-	-	11.5	+	5.	+	18.	+
N. Y.	366	t	+	t	+	t	+	t	+	t	+
*N. J.	280	-	-	-	-	-	-	-	-	-	-
Pa.	408	0.5	2	0.3	1	10.	46	0.2	1	11.	50
Ohio	441	0.2	1	-	-	-	-	-	-	0.2	1
Ind.	320	2.	7	-	-	-	-	2.	7	4.	14
Ill.	436	t	+	t	+	1.	4	1.	4	3.	12
Mich.	1365	t	+	t	+	10.	152	t	+	10.	152
Wis.	210	0.5	1	0.5	1	5.	11	-	-	6	13
Minn.		5.	+	-	-	5.	+	-	-	10.	+
Iowa	68	3	2	-	-	0.2	+	-	-	3.3	2
*Mo.	472	-	-	-	-	-	-	-	-	-	-
N. D.		t	+	-	-	-	-	0.5	+	1.	+
*Kan.	58	-	-	-	-	-	-	-	-	-	-
Del.	225	t	+	t	+	12.	32	1.	3	15.	40
Md.	474	2.	13	1.	6	18.	116	5.	32	26.3	169
Va.	524	1.	6	0.5	3	6.	37	-	-	15.5 b/	96
N. C.	506	12.	81	8	54	-	-	2.	14	25	169
*S. C.	22	-	-	-	-	-	-	-	-	-	-
*Ga.	19	-	-	-	-	-	-	-	-	-	-
*Fla.	765	-	-	-	-	-	-	-	-	-	-
*Ky.	534	-	-	-	-	-	-	-	-	-	-
*Tenn.	850	-	-	-	-	-	-	-	-	-	-
*Ala.	306	-	-	-	-	-	-	-	-	-	-
*Miss.	23	-	-	-	-	-	-	-	-	-	-
Ark.	879	0.3	3	0.2	2	-	-	-	-	6. b/	56
La.	1400	12.	210	3.	53	-	-	5.	88	20.1	353
Okla.	40	2.	1	3.	1	3.	1	-	-	12.	5
Tex.	108	0.5	1	t	+	2.	2	1.	1	3.5	4
Mont.		t	+	t	+	5.	+	1.	+	6.	+
Ida.		t	+	0	0	-	-	1.	+	13. b/	+
Ariz.		-	-	-	-	15.	+	-	-	15.	+
*Utah	84	-	-	-	-	-	-	-	-	-	-
Wash.	532	t	+	-	-	3.	17	0.4	2	4.	22
Ore.	1037	0.1	1	0	0	3.	35	1.1	13	12.2 b/	143
*Calif.	872	-	-	-	-	-	-	-	-	-	-
U. S.	13624	3.1	329	1.1	121	4.3	453	1.6	165	12.3	1301

°24 quart crates.

*Omitted from calculations for U. S. percentage loss.

Percentage of total listed production in States reporting, 69.

a/ Black root rot, except as follows: red stele (Phytophthora sp.) in Del. 10 percent, Md. 15, Va. 3, Ill. 1, Mass. 0.5, Iowa 0.1, traces in N. Y. Mich., Wis., Oreg.

b/ Va.: includes dwarf (Aphelenchoides fragariae) 5 percent, leaf variegation (genetic) 3 percent.

Ark.: Leaf variegation 5 percent.

Idaho: Other diseases, largely alkali soil, 12 percent.

Oreg.: Crinkle (virus) 8 percent.

Table . Estimated reduction in yield due to black rot (Guignardia bidwellii), powdery mildew (Uncinula necator), downy mildew (Plasmopara viticola), and other diseases, 1939.

State	Production tons	Black rot %	Black rot Tons	Powdery mildew %	Powdery mildew Tons	Downy mildew %	Downy mildew Tons	All diseases %	All diseases Tons
*Maine	30	-	-	-	-	-	-	-	-
*N. H.	110	-	-	-	-	-	-	-	-
Vermont	50	t	+	-	-	-	-	t	+
Mass.	700	2.	15	t	+	0.5	4	4.	30
*R. I.	230	-	-	-	-	-	-	-	-
Connecticut	2460	5.	129	-	-	-	-	5.	129
New York	75600	4.	3150	t	+	t	+	4.	3150
*New Jersey	3100	-	-	-	-	-	-	-	-
Pa.	23 200	9.	2307	t	+	t	+	9.5	2435
N. Atlantic	105480	5.2	5601	t	+	t	4	5.3	5744
Ohio	42800	4.	1793	-	-	0.5	224	4.5	2017
*Indiana	4800	-	-	-	-	-	-	-	-
Illinois	8800	1.	88	t	+	t	+	1.	88
Michigan	58100	10.	6456	-	-	t	+	10.	6456
Wisconsin	490	3.	15	t	+	t	+	3.	15
Minnesota	290	0.	0	0	0	0	0	0	0
Iowa	5800	0.1	6	0.1	6	0.1	6	0.4	24
*Missouri	12500	-	-	-	-	-	-	-	-
*Nebraska	3000	-	-	-	-	-	-	-	-
*Kansas	4100	-	-	-	-	-	-	-	-
N. Central	140680	6.7	8358	t	6	0.2	230	6.9	8600
Delaware	2000	2.	43	-	-	2.	43	6.	129
Maryland	750	5.	40	1.	8	1.	8	7.2	58
Virginia	2600	5.	141	1.	28	1.	28	8.	225
W. Va.	1750	2.	36	-	-	-	-	2.	36
N. C.	7500	15.	1398	2.	186	-	-	19.5	1817
*S. C.	2020	-	-	-	-	-	-	-	-
Georgia	1830	5.	96	-	-	-	-	5.	96
*Florida	670	-	-	-	-	-	-	-	-
S. Atlantic	19120	9.3	1754	1.2	222	0.4	79	12.5	2361
*Kentucky	2750	-	-	-	-	-	-	-	-
*Tennessee	2240	-	-	-	-	-	-	-	-
*Alabama	1710	-	-	-	-	-	-	-	-
*Mississippi	290	-	-	-	-	-	-	-	-
Arkansas	8200	10.	921	-	-	t	+	11.	1013
*Louisiana	50	-	-	-	-	-	-	-	-
Oklahoma	3200	7.	241	-	-	-	-	7.	241
Texas	2800	1.	28	t	+	-	-	1.	28
S. Central	21240	7.7	1190	-	+	-	+	8.3	1282
Idaho	580	0	0	0	0	0	0	4.	24
*Colorado	500	-	-	-	-	-	-	-	-
*New Mexico	1170	-	-	-	-	-	-	-	-
Arizona	710	-	-	-	-	-	-	1.	7
*Utah	840	-	-	-	-	-	-	-	-
*Nevada	110	-	-	-	-	-	-	-	-
Wash.	5400	-	-	t	+	-	-	t	+
Ore.	1700	-	-	0.2	3	-	-	0.7	12
*California	2173000	-	-	-	-	-	-	-	-
Far Western	2184010	-	-	-	3	-	-	-	43
U. S.	2470530	6.1	16903	0.1	231	0.1	313	6.5	18030

*Omitted from calculations for U. S. and section percentage loss.

Percentage of total listed production in States reporting: for the whole country 10; outside of Far West, 87; N. Atl. 97; N. Cent. 83; S. Atl. 86; S. Cent. 67; Far West 0.4.

THE PLANT DISEASE REPORTER

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Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Supplement 128

Diseases of Plants in the United States in 1939

December 31, 1940

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DISEASES OF PLANTS IN THE UNITED STATES IN 1939

Compiled by

Nellie W. Nance, Junior Pathologist
Division of Mycology and Disease Survey.

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CONTENTS

LIST OF COLLABORATORS AND CONTRIBUTORS FOR THE YEAR 1939

ALABAMA, Agricultural Experiment Station, Auburn - J. L. Seal.
Auburn - W. A. Gardner.
State Department of Agriculture, Fairhope - H. M. Darling.
Tuskegee Institute, Tuskegee - George W. Carver.

ARIZONA, University Station, Tucson - J. G. Brown.
College of Agriculture, Tucson - R. B. Streets.

ARKANSAS, University of Arkansas, Fayetteville - E. M. Cralley, H. R. Rosen, L. M. Weetman, V. H. Young

CALIFORNIA, University of California, Berkeley - Peter A. Ark, J. T. Barrett, M. W. Gardner, T. E. Rawlins, C. E. Scott, W. C. Snyder, Harold E. Thomas, Harvey E. Thomas, C. M. Tompkins.
Citrus Experiment Station, Riverside - E. T. Bartholomew, H. S. Fawcett, W. T. Horne, L. C. Cochran, and others.
Agricultural Experiment Station, Davis - J. B. Kendrick, W. B. Hewitt.
State Department of Agriculture, Sacramento - M. R. Harris, G. L. Stout.
Agricultural Experiment Station, Berkeley - B. A. Rudolph, R. E. Smith, E. E. Wilson.
University of California, Los Angeles - Pierre A. Miller, G. R. Johnstone.

COLORADO, Agricultural College, Fort Collins - L. W. Durrell, E. C. Smith.

CONNECTICUT, Agricultural Experiment Station, New Haven - Florence A. McCormick, E. M. Stoddard.
Tobacco Experiment Station, Windsor - P. J. Anderson.

DELAWARE, Agricultural Experiment Station, Newark - K. D. Kadow, T.F. Manns

DISTRICT OF COLUMBIA, C. L. Shear.

FLORIDA, Agricultural Experiment Station, Gainesville - A. N. Brooks, A. H. Eddins, L. C. Gratz, D.G.A. Kelbert, W. A. Kuntz, K. W. Loucks, A. S. Rhoads, G. D. Ruehle, W. B. Shippey, W.B. Tisdale, G. R. Townsend, M. N. Walker, G. F. Weber, Erdman West.

GEORGIA, State College of Agriculture, Athens - T. H. McHatton, J. H. Miller
Experiment Station, Experiment - B. B. Higgins, Frank Van Haltern.

IDAHO, Agricultural Experiment Station, Moscow - C. W. Hungerford.
University of Idaho, Moscow - Earle C. Blodgett, John Ehrlich.

ILLINOIS, University of Illinois, Urbana - H. W. Anderson, G. H. Dungan, B. Koehler, J. W. Lloyd, F. F. Weinard, Neil E. Stevens, H. H. Thornberry.
State Natural History Survey, Urbana - L. R. Tehon, G. H. Boewe.

INDIANA, Agricultural Experiment Station, Lafayette - R. M. Caldwell, J. A. McClintock, R. W. Samson.
Purdue University, Lafayette - C. L. Porter.

IOWA, Agricultural Experiment Station, Ames - J. C. Gilman, I. E. Melhus, George Semeniuk.
Iowa State Teachers' College, Cedar Falls - C. W. Lantz.
Iowa State College, Ames - Glen N. Davis, R. H. Porter, C. S. Reddy.

KANSAS, State Agricultural College, Manhattan - Don B. Creager, O. H. Elmer, E. H. Leker, L. E. Melchers.

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MAINE, Agricultural Experiment Station, Orono - Reiner Bonde, D. Folsom, M. T. Hilborn, F. H. Steinmetz.

MARYLAND, Maryland Agricultural College, College Park - R. A. Jehle, E. A. Walker.
Agricultural Experiment Station, College Park - J. B. S. Norton, C. E. Temple.

MASSACHUSETTS, Massachusetts Agricultural College, Amherst - O. C. Boyd, W. H. Davis, W. L. Doran, M. A. McKenzie, A. V. Osmun.
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NEVADA, Agricultural Experiment Station, Reno - P. A. Lehenbauer.

NEW HAMPSHIRE, Agricultural Experiment Station, Durham - S. J. Dunn.
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NEW MEXICO, New Mexico Agricultural College, State College - H. L. Barnett
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C. Chupp, A. W. Dimock, C. E. F. Guterman, H. M. Fitzpatrick,
E. M. Hildebrand, L. M. Massey, W. D. Mills, A. G. Newhall,
H. H. Whetzel.
Agricultural Experiment Station, Geneva - J. G. Horsfall, R. O. Magie
D. H. Palmiter, O. A. Reinking.
Brooklyn Institute of Applied Agriculture, Farmingdale - Mary K.
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University of North Carolina, Chapel Hill - W. C. Coker.
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Thomas, P. E. Tilford, J. D. Wilson, H. C. Young.
Ohio State University, Columbus - A. L. Pierstorff.
University of Cincinnati, Cincinnati - O. T. Wilson.

OKLAHOMA, Agricultural Experiment Station, Stillwater - F. M. Rolfs.
307 Fifth Street, Durant - W. L. Blain.
Agricultural & Mechanical College, Stillwater - W. W. Ray, Robert
Stratton, K. Starr Chester.
State Board of Agriculture, Oklahoma City - T. B. Gordon.

OREGON, Agricultural Experiment Station, Corvallis - C. E. Owens,
S. M. Zeller.
Hood River College, Hood River - LeRoy Childs.

PENNSYLVANIA, Agricultural Experiment Station, State College - F. D. Kern, E. L. Nixon.
Pennsylvania Field Laboratory, Bustleton - W. S. Beach.
Pennsylvania State College, State College - A. H. Bauer, O. D. Burke, R. S. Kirby, H. W. Rankin, H. W. Thurston, G. L. Zundel.

RHODE ISLAND, Rhode Island State College, Kingston - H. W. Browning, F. L. Howard.

SOUTH CAROLINA, Agricultural Experiment Station, Clemson - G. M. Armstrong.
South Carolina Agricultural College, Clemson - W. C. Nettles, D. B. Rosenkrans.
State Crop Pest Commission, Clemson - M. B. Stevenson, Jr.

SOUTH DAKOTA, Northville - J. F. Brenckle.
State College, Brookings - L. C. Snyder, S. P. Swenson.

TENNESSEE, Agricultural Experiment Station, Knoxville - C. D. Sherbakoff.
University of Tennessee, Knoxville - J. O. Andes, L. R. Hesler.

TEXAS, Agricultural Experiment Station, CollegeStation - G. E. Altstatt, A. A. Dunlap, W. N. Ezekiel, A. L. Martin, G. M. Watkins, P. A. Young.
Temple Sub-Station - Colonel Hoyt Rogers.
Tyler Sub-Station - E. W. Lyle.
Weslaco Sub-Station - W. J. Bach, G. H. Godfrey.
Winter Haven Sub-Station - S. S. Ivanoff.
Yoakum Sub-Station - A. L. Harrison.

UTAH, Utah Agricultural College, Logan - B. L. Richards.

VERMONT, Agricultural Experiment Station, Burlington - C. H. Blasberg, M. B. Cummings, B. F. Lutman.

VIRGINIA, Agricultural Experiment Station, Blacksburg - J. G. Harrar, R. G. Henderson, A. B. Massey, G. M. Shear, S. A. Wingard.
Virginia Truck Experiment Station, Norfolk - H. T. Cook.
Field Laboratory, Winchester - A. B. Groves.
Piedmont Field Laboratory, Charlottesville - R. H. Hurt.
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Virginia Experiment Station, Chatham - J. A. Pinckard, Jr.

WASHINGTON, Agricultural Experiment Station, Pullman - F. D. Heald.
Longbeach - D. J. Crowley.
Washington State College, Pullman - L. K. Jones.
Western Washington Experiment Station, Puyallup - G. A. Huber.

WEST VIRGINIA, West Virginia College of Agriculture, Morgantown - J. G. Leach, C. R. Orton.
Agricultural Experiment Station, Morgantown - A. Berg, E. C. Sherwood.

WISCONSIN, Agricultural Experiment Station, Madison - L. R. Jones.
University of Wisconsin, Madison - G. W. Keitt, A. J. Riker, R. E. Vaughan.

WYOMING, Agricultural Experiment Station, Laramie - Aven Nelson, W. G. Solheim, G. H. Starr.

HAWAII, Pineapple Experiment Station, Honolulu - C. P. Sideris.

PUERTO RICO, Insular Experiment Station, Rio Piedras - M. T. Cook.

INTRODUCTION

This report on the incidence of plant diseases in the United States in 1939 is the twenty-third annual report compiled by the Plant Disease Survey. The Survey wishes to thank its collaborators and others whose cooperation has made these reports possible.

In 1939 the generally hot dry growing season was unfavorable to the spread and development of many plant diseases. There were no widespread epidemics and losses generally were considerably less than in 1938.

The United States Weather Bureau reports show that while the year 1939 averaged slightly cooler than 1938, one of the warmest years of record, it was still warmer than normal nearly everywhere in the United States (Figs. 1 to 4). The New England States was the only section with slightly below-normal warmth for the year. Over much of the country the year averaged more than 2.5° above the yearly mean. Reports also show that the year 1939 was considerably drier than 1938. The winter of 1939 (Fig. 5) was abnormally wet rather generally in the eastern United States, and in the Southwest, with much the greater portion of the country having above normal amounts. The spring (Fig. 6) was decidedly dry with only a few States from the Mississippi Valley eastward having somewhat more than normal rainfall. From the Great Plains westward all States had deficiencies. The summer (Fig. 7) was relatively wet to eastward of the Great Plains, except in the Northeast, but rainfall was deficient in nearly all sections from the Great Plains westward. The fall season (Fig. 8) was extremely dry over large areas, although precipitation was decidedly above normal in Utah, Colorado, and Arizona. From the Rocky Mountains eastward it was the driest fall of record, considering the area as a whole. Detailed records of 6 stations representing various sections of the United States are given in Figs. 9 to 2

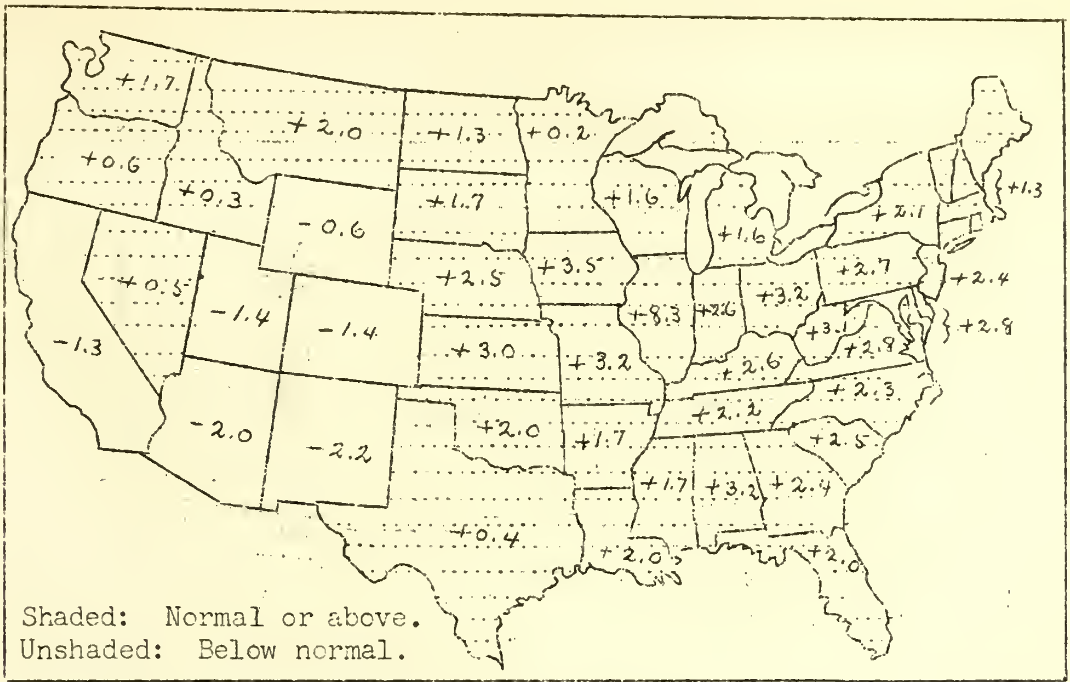

Fig. 1. Departure from the normal temperatures for the winter, December 1938 to February 1939, inclusive.

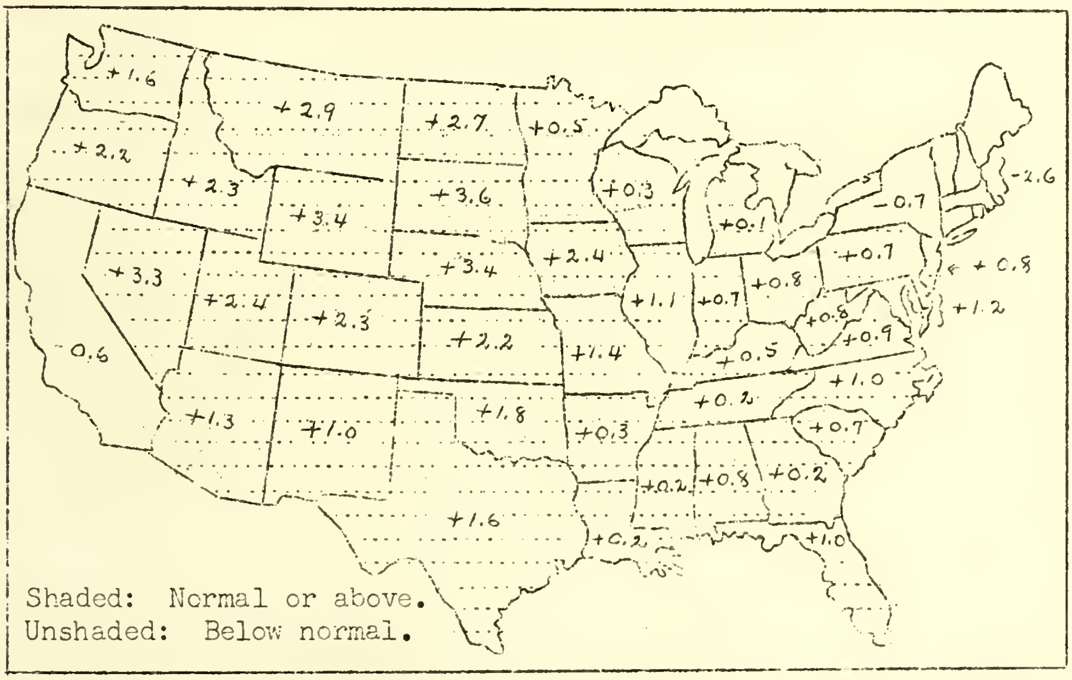

Fig. 2. Departure from the normal temperature for the spring, March to May 1939, inclusive.

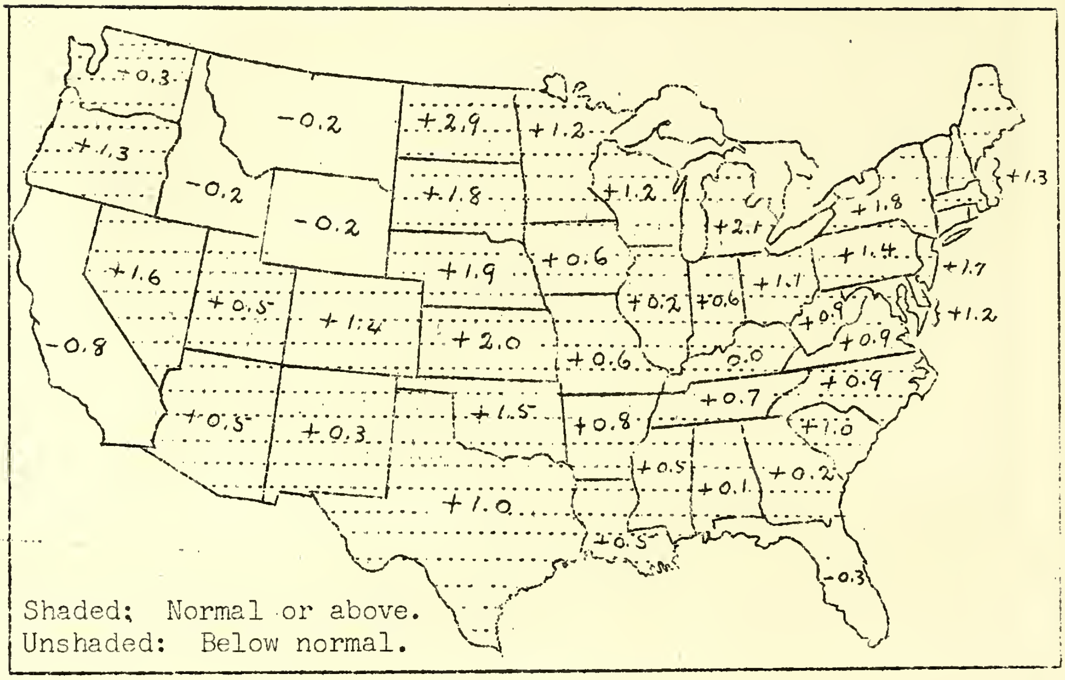

Fig. 3. Departure from the normal temperature for the summer, June to August 1939, inclusive.

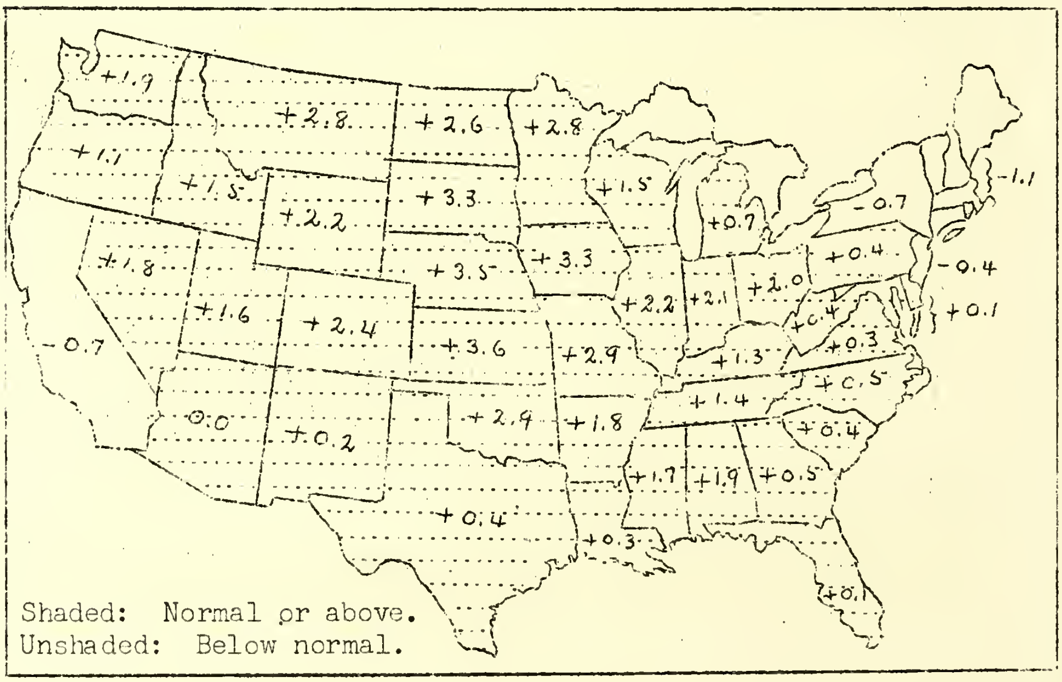

Fig. 4. Departure from the normal temperature for the autumn, September to November 1939, inclusive.

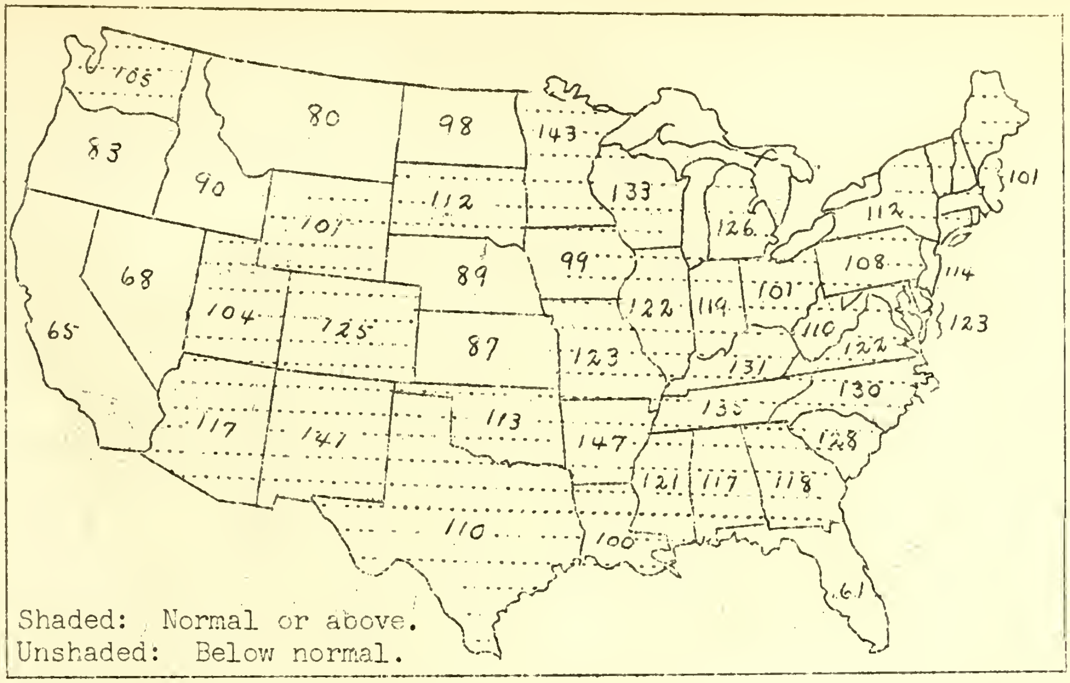

Fig. 5. Percentage of normal precipitation for the winter, December 1938 to February 1939, inclusive. (From Weekly Weather and Crop Bulletin, March 21, 1939).

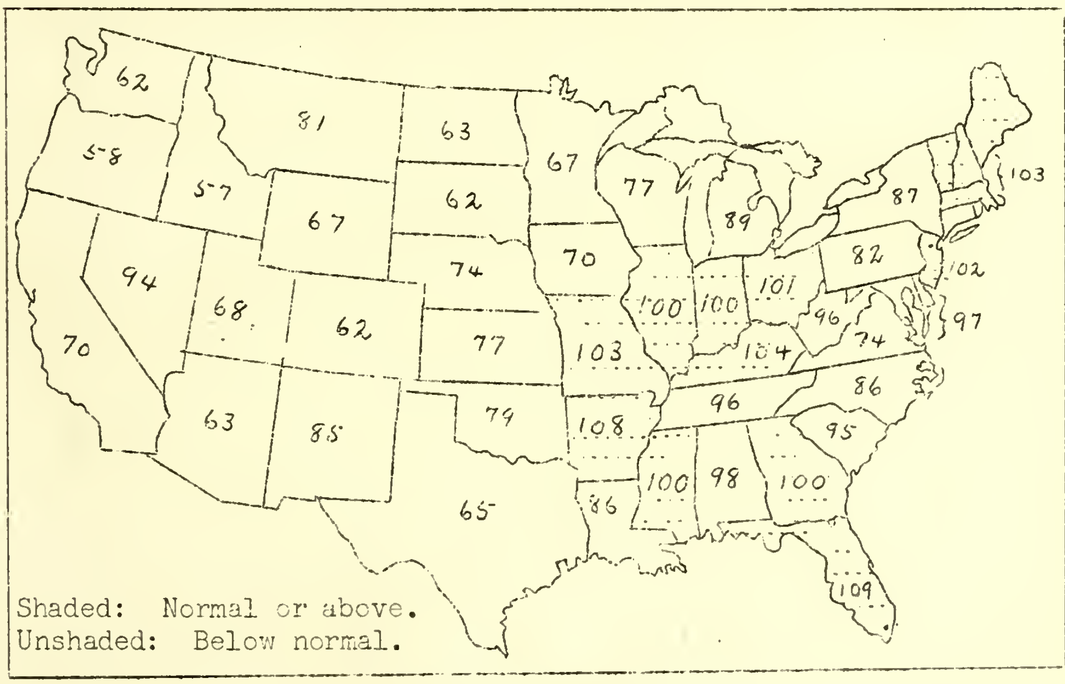

Fig. 6. Percentage of normal precipitation for the spring, March to May 1939, inclusive.

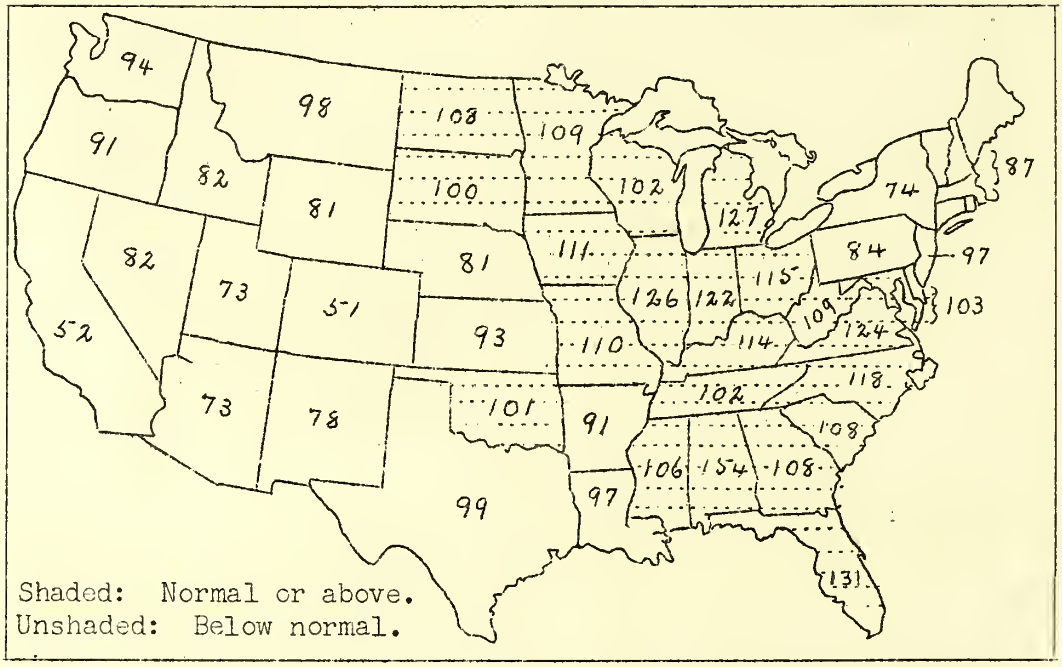

Fig. 7. Percentage of normal precipitation for the summer, June to August 1939, inclusive.

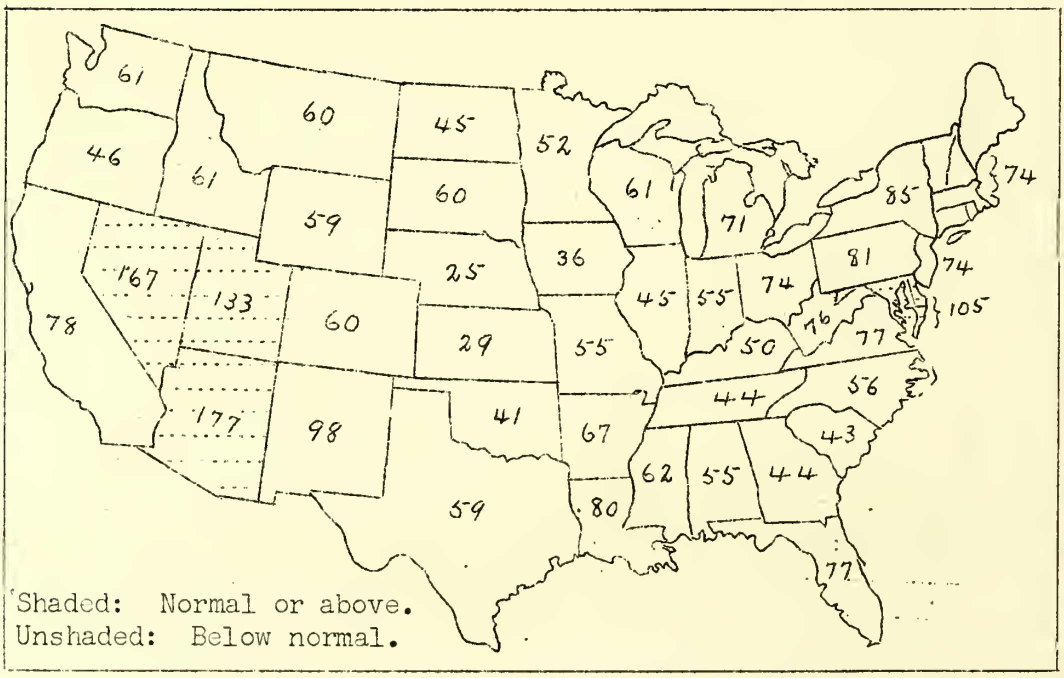

Fig. 8. Percentage of normal precipitation for the autumn, September to November, inclusive, 1939 (From Weekly Weather and Crop Bulletin, December 12, 1939).

HARRISBURG, PENNSYLVANIA

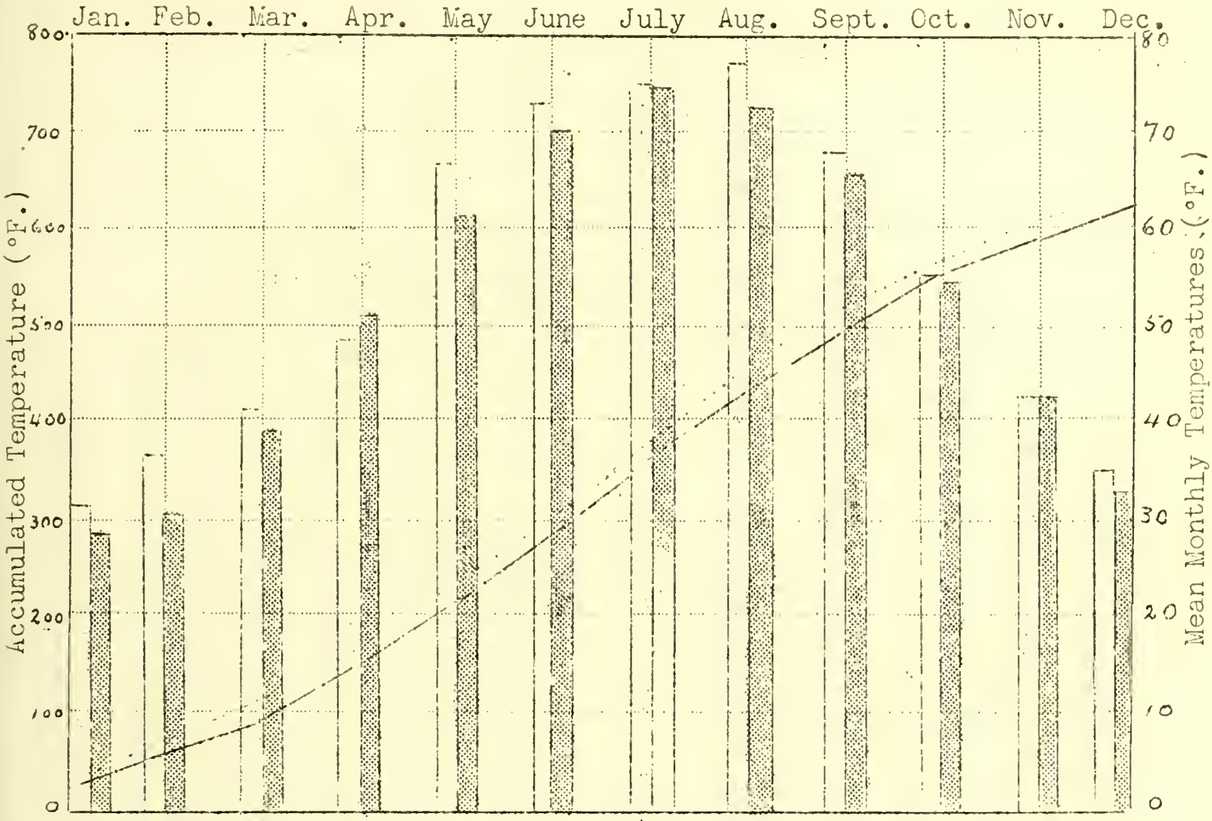

Fig. 9. Accumulated temperature in degrees F. at Harrisburg, Pennsylvania, for the year 1939 (dotted line) compared with normal (solid line) and mean monthly temperatures (plain bars) compared with normal (shaded bars).

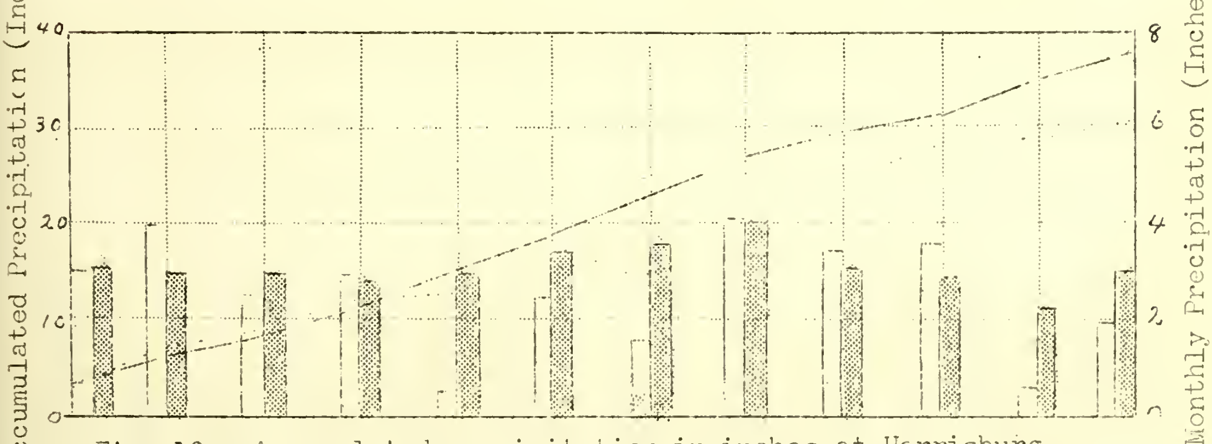

Fig. 10. Accumulated precipitation in inches at Harrisburg, Pennsylvania, for the year 1939 (dotted line) compared with normal (solid line), and monthly precipitation (plain bars) compared with normal (shaded bars).

ATLANTA, GEORGIA

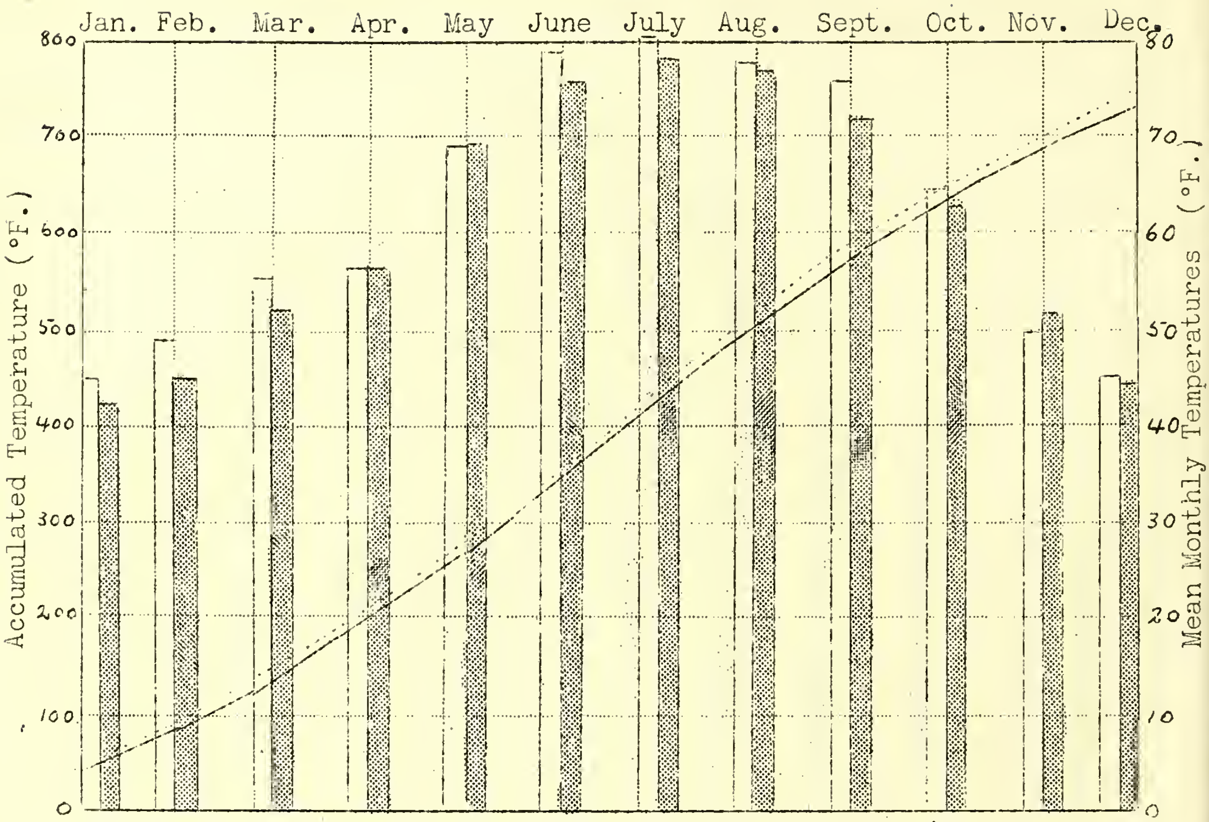

Fig. 11. Accumulated temperature in degrees F. at Atlanta, Georgia, for the year 1939 (dotted line) compared with normal (solid line), and mean monthly temperatures (plain bars) compared with normal (shaded bars).

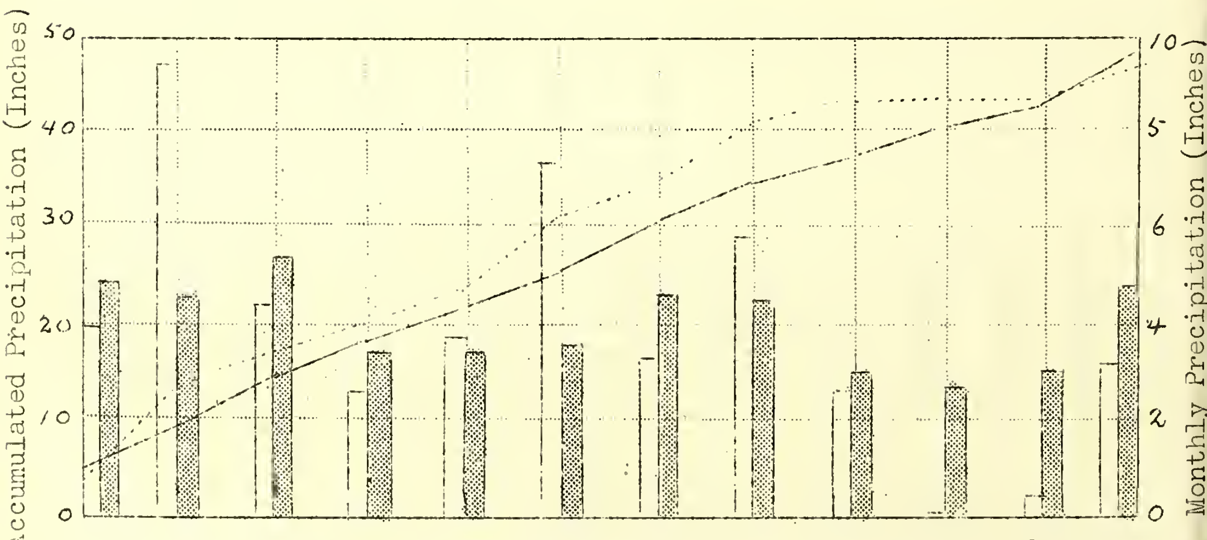

Fig. 12. Accumulated precipitation in inches at Atlanta, Georgia, for the year 1939 (dotted line) compared with normal (solid line), and monthly precipitation (plain bars) compared with normal (shaded bars).

BISMARCK, NORTH DAKOTA

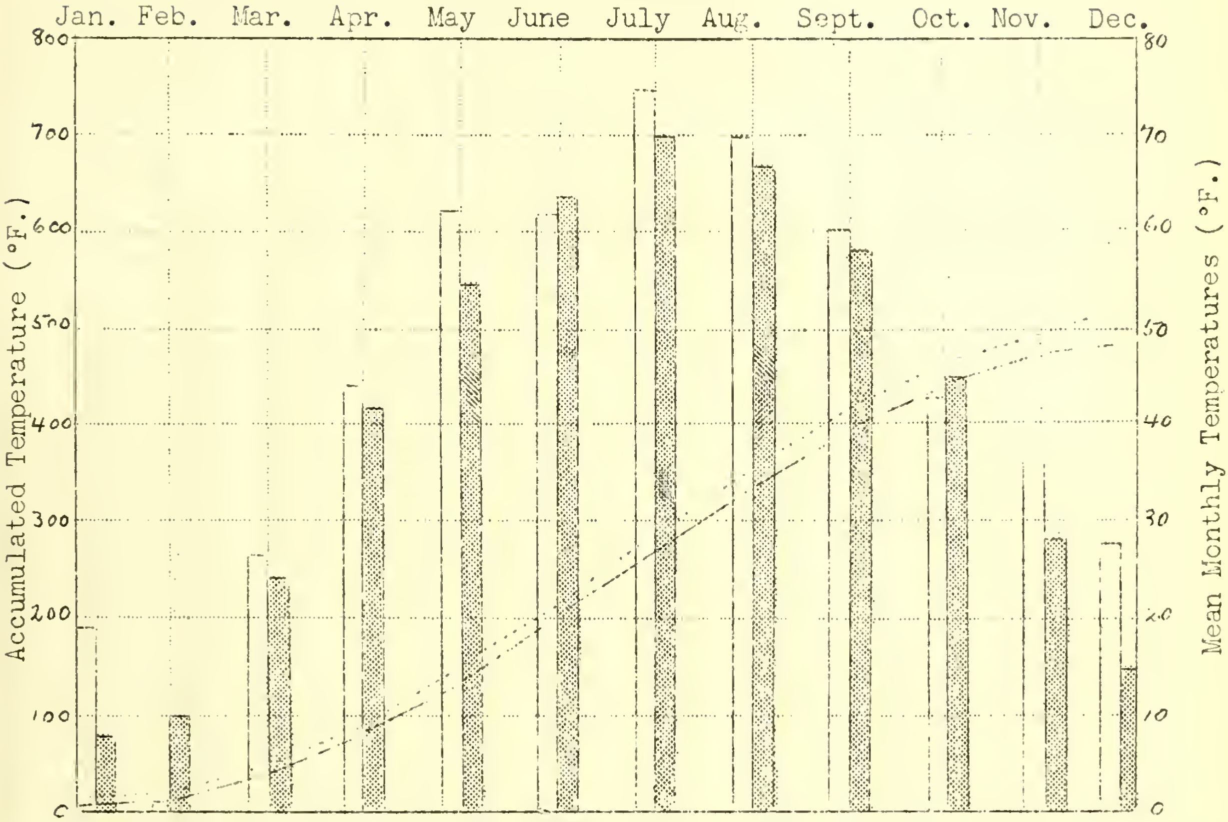

Fig. 13. Accumulated temperature in degrees F. at Bismarck, North Dakota, for the year 1939 (dotted line) compared with normal (solid line), and mean monthly temperature (plain bars) compared with normal (shaded bars).

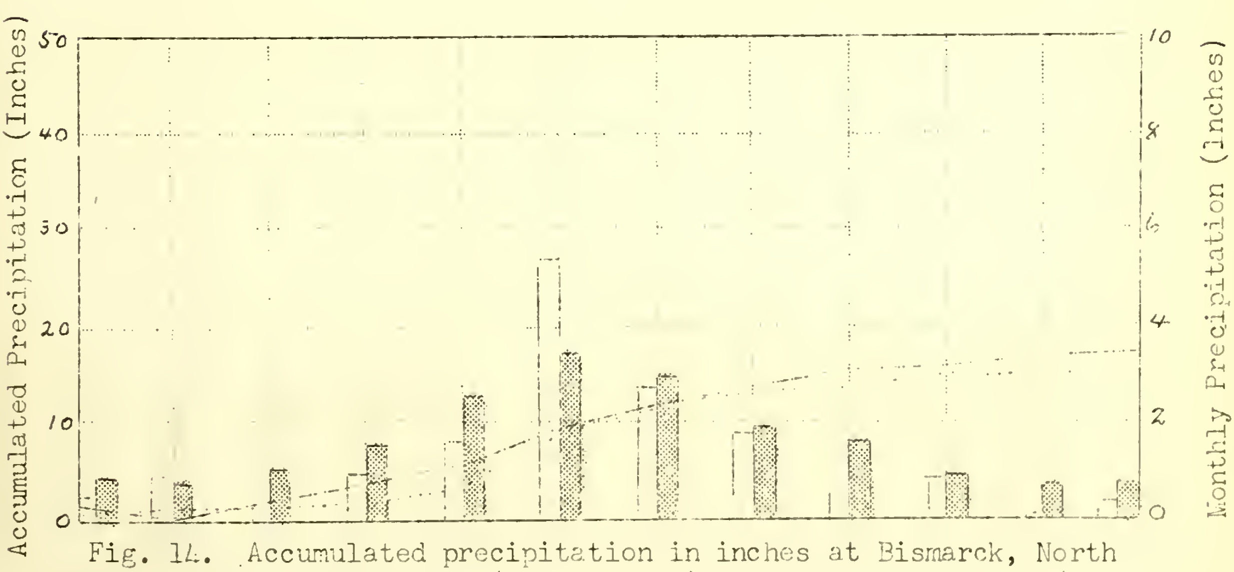

Fig. 14. Accumulated precipitation in inches at Bismarck, North Dakota, for the year 1939 (dotted line) compared with normal (solid line), and monthly precipitation (plain bars) compared with normal (solid bars).

LITTLE ROCK, ARKANSAS

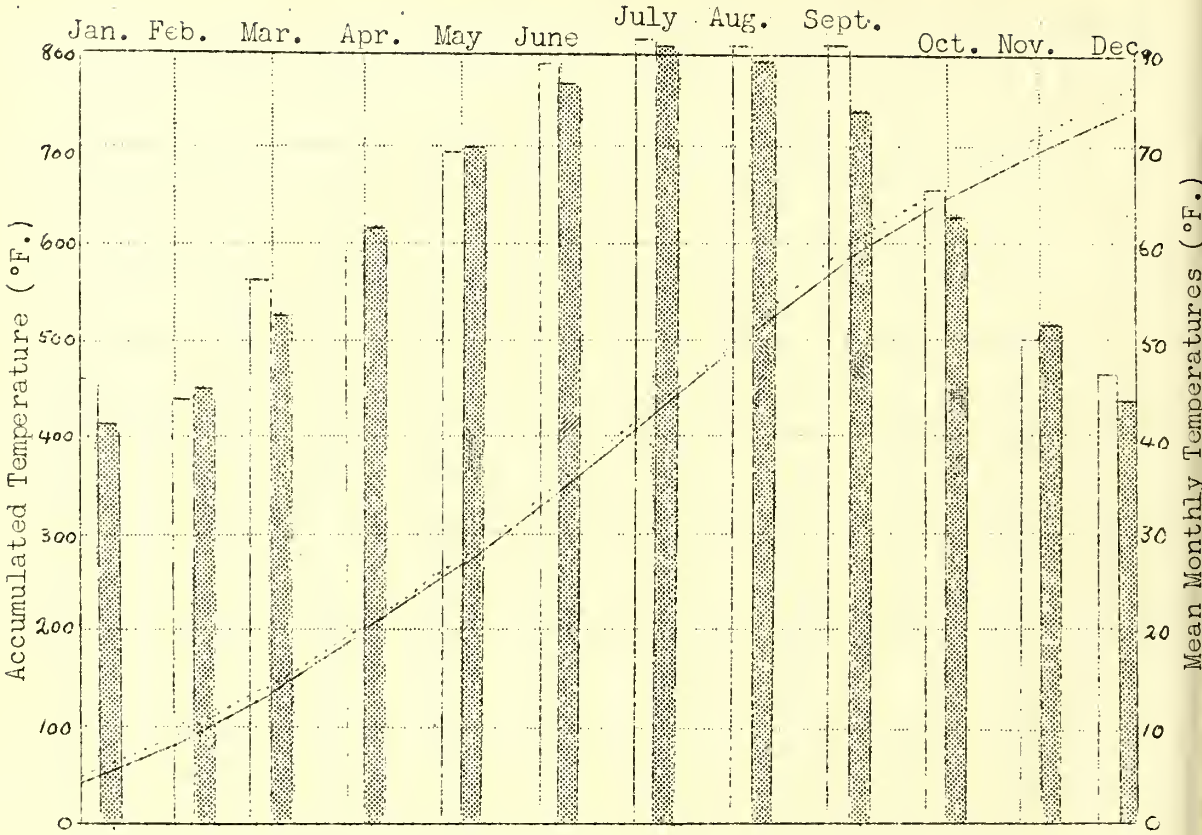

Fig. 15. Accumulated temperature in degrees at Little Rock, Arkansas, for the year 1939 (dotted line) compared with normal (solid line) and mean monthly temperatures (plain bars) compared with normal (solid bars).

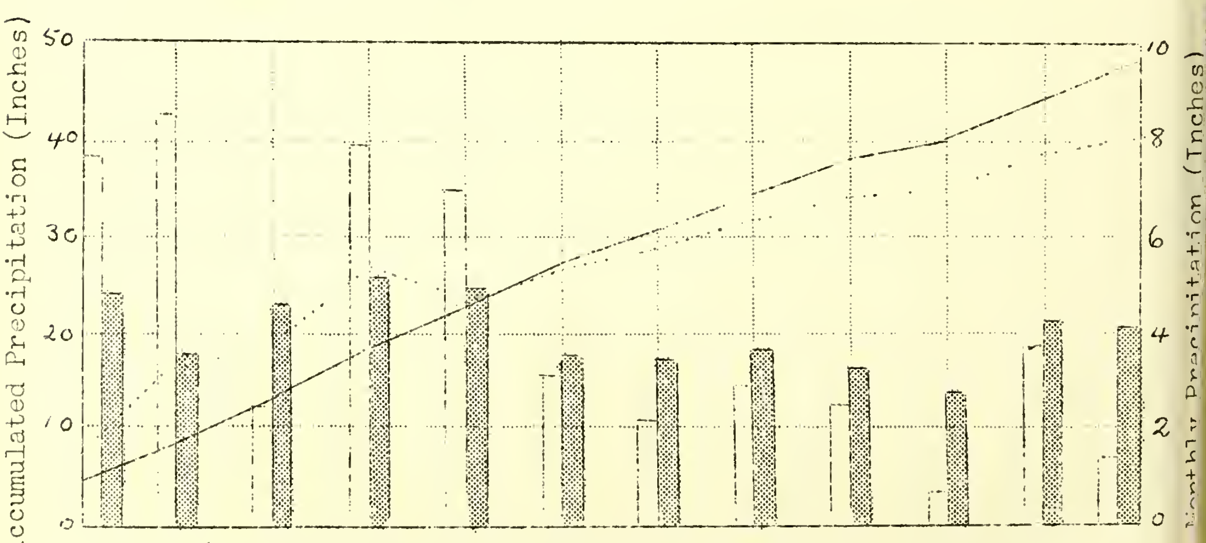

Fig. 16. Accumulated precipitation in inches at Little Rock, Arkansas, for the year 1939 (dotted line) compared with normal (solid line) and monthly precipitation (plain bars) compared with normal (shaded bars).

PORTLAND, OREGON

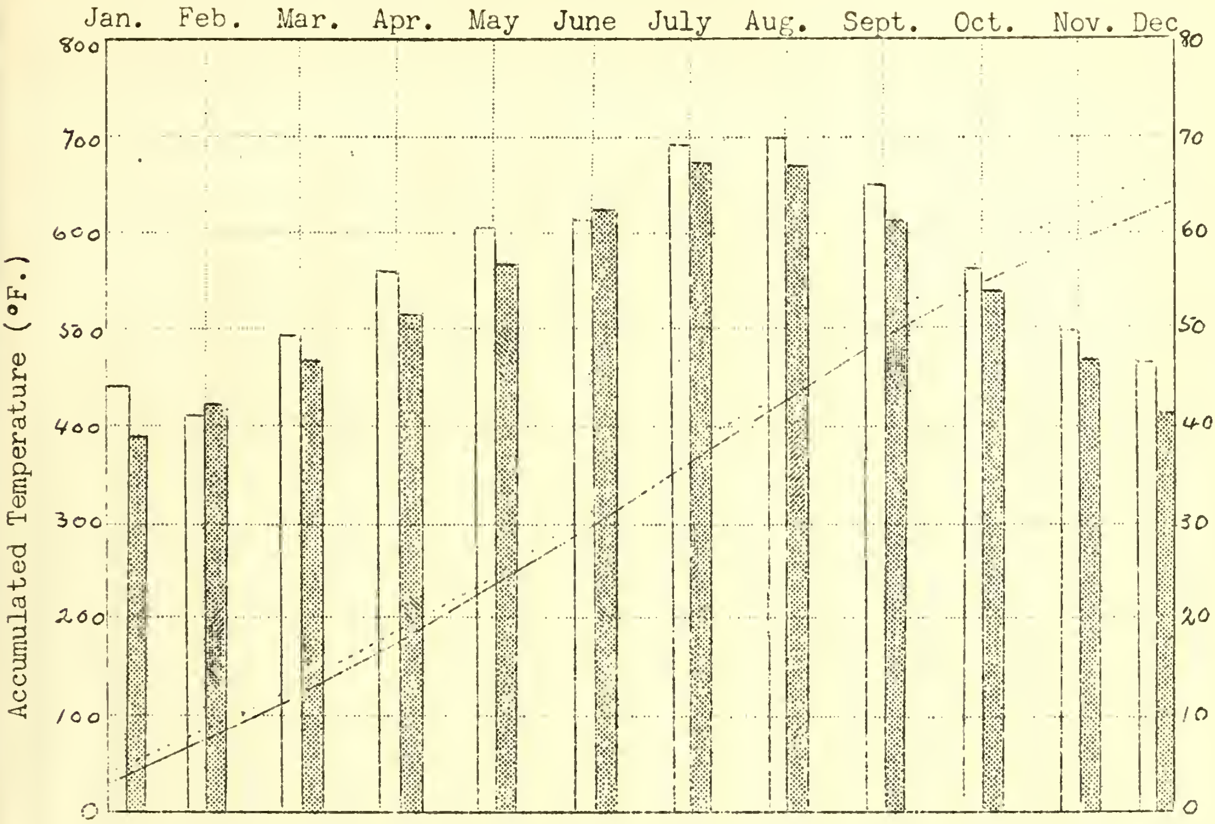

Fig. 17. Accumulated temperature in degrees F. at Portland, Oregon, for the year 1939 (dotted line) compared with normal (solid line), and mean monthly temperatures (plain bars) compared with normal (shaded bars).

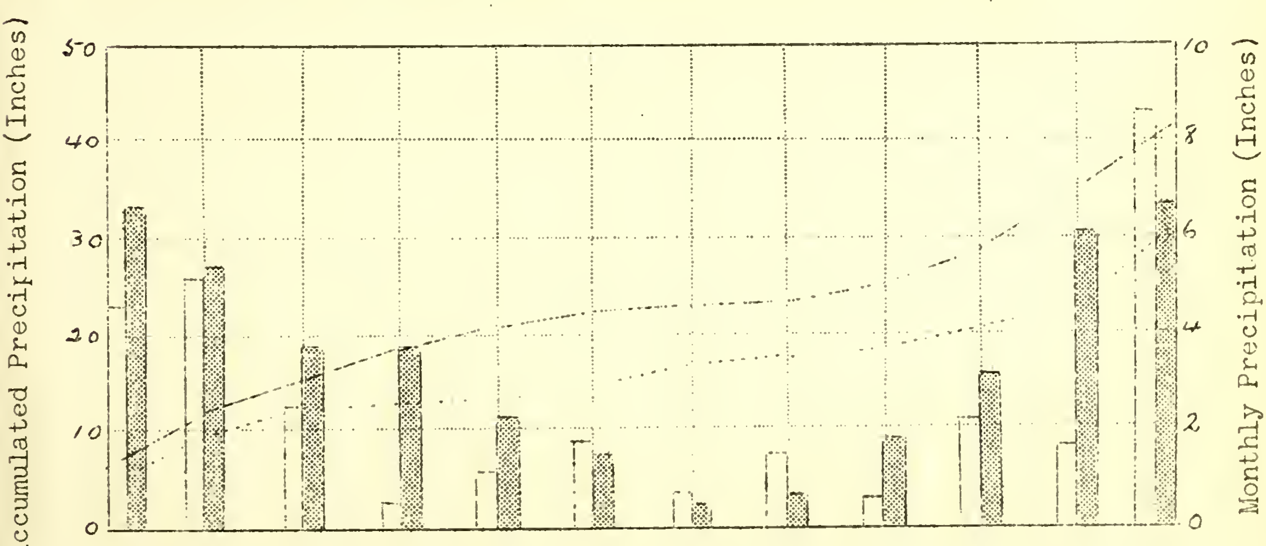

Fig. 18. Accumulated precipitation in inches at Portland, Oregon, for the year 1939 (dotted line) compared with normal (solid line), and monthly precipitation (plain bars) compared with normal (shaded bars).

SACRAMENTO, CALIFORNIA

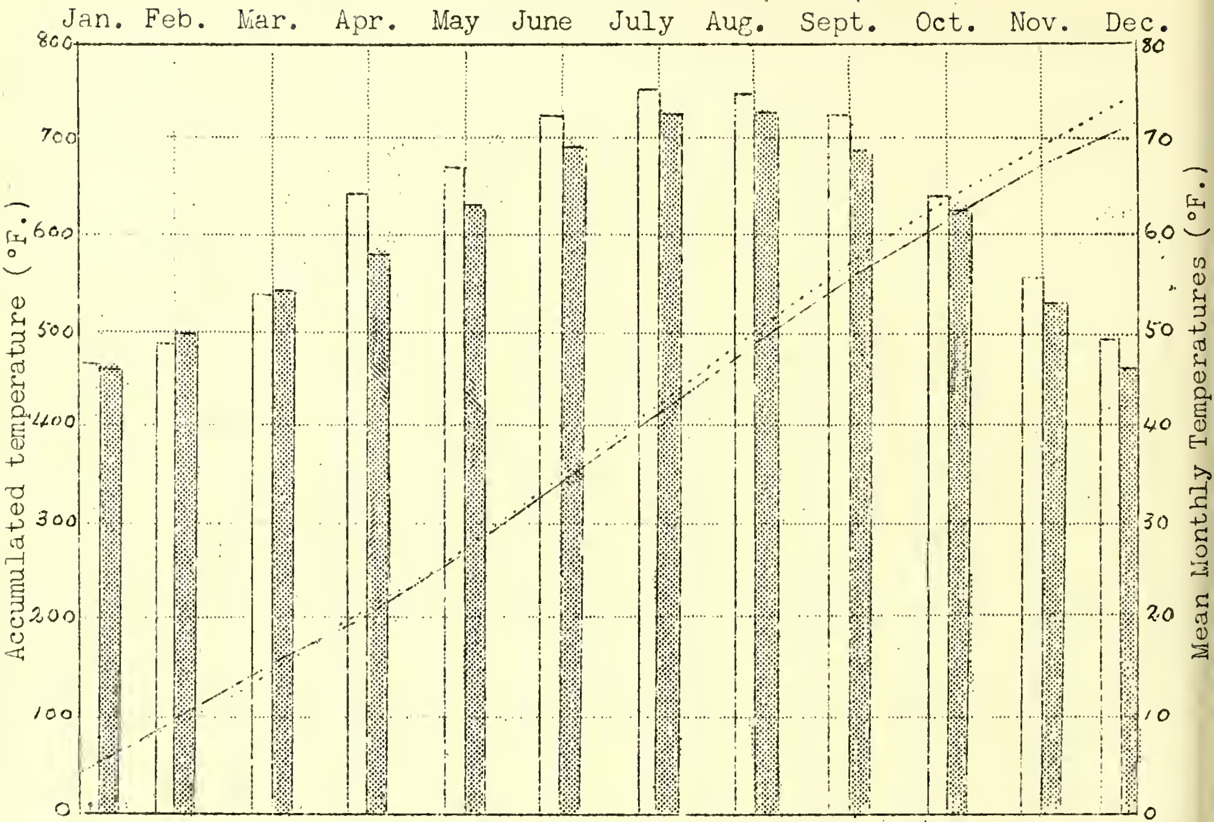

Fig. 19. Accumulated temperature in degrees F. at Sacramento, California, for the year 1939 (dotted line) compared with normal (solid line), and mean monthly temperatures (plain bars) compared with normal (shaded bars).

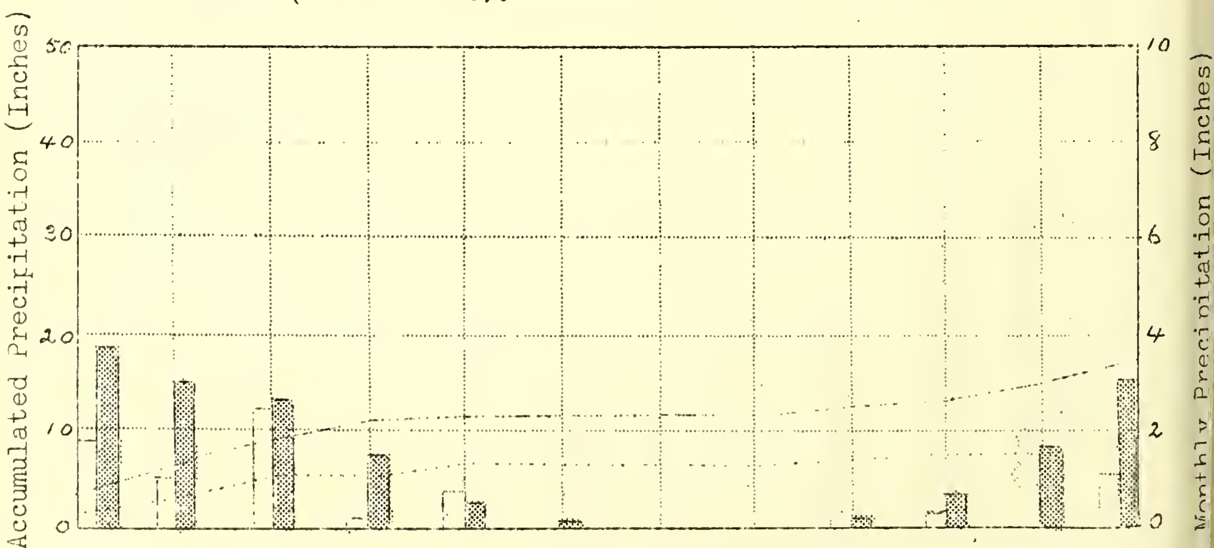

Fig. 20. Accumulated precipitation in inches at Sacramento, California, for the year 1939 (dotted line) compared with normal (solid line), and monthly precipitation (plain bars) compared with normal (shaded bars).

DISEASES OF CEREAL CROPS

AVENA SATIVA. OATS:

Erysiphe graminis, powdery mildew, was reported causing a trace loss in Massachusetts, Ohio, Indiana, Michigan, Washington, and Oregon. North Carolina reported 0.5 percent loss. At University Farm, Davis, California, C. A.Suneson reported that mildew contributed to the breaking over of many varieties shortly before maturity.

Fusarium spp. and other organisms, foot and root rots. In Michigan, J. H. Muncie estimated a trace loss, and Iowa reported 1 percent loss caused by Fusarium. In the latter State root rots, especially that due to Pythium debarynum, caused an estimated loss of 6 percent.

Gibberella zeae, scab. R. A. Jehle reported a trace loss in Maryland. In Illinois, the Natural History Survey reported the maximum infection in any one field was "40.3 percent of heads and 2.5 percent of spikelets. Average prevalence was 5.4 percent; average spikelets infected was 0.34 percent." J. J. Christensen reported scab less prevalent than last year in Minnesota.

Helminthosporium avenae, leaf spot, was observed in Virginia, Illinois, Michigan, Iowa, Washington, and Oregon, causing slight losses.

Phytomonas coronafaciens, halo leaf blight, was observed in Oklahoma and Minnesota.

Puccinia coronata avenae, crown rust, was of little consequence as compared to 1938. The highest estimate reported was 5 percent in Arkansas. At the Rice Branch Station, Stuttgart, C.R. Adair reported the oat crop in that territory was the best since 1931. Crown rust was noted but it did not develop at the usual time. Iowa reported an estimated reduction in yield of 3.5 percent; Illinois and Wisconsin each reported 3 percent; Maryland 1.5 percent; Massachusetts, Virginia, North Carolina, Oklahoma, Minnesota, and Oregon, each 1 percent. Other States reporting less were New York, Pennsylvania, West Virginia, Texas, Ohio, Indiana, Michigan, North Dakota, and Washington. P. graminis avenae, stem rust, was relatively unimportant again this year, only 3 States, Massachusetts, Virginia and Indiana reporting as high as 1 percent loss. Stem rust was present in 20 other States.

Sclerospora macrospora, downy mildew, was reported by L. E. Miles in Mississippi for the first time on oats in this country and on any host in Mississippi. (PDR 23:207)

Ustilago avenae and U. levis, loose and covered smuts, were reported less prevalent generally than in 1938. Reports were received from 27 States with average losses from a trace to 8 percent as compared to losses from a trace to 14 percent in 1938. Percentage losses and States reporting are given in the Crop Loss Estimates.

Blast (cause unknown) was reported less prevalent than for several previous years in New York by K. D. Butler and M. F. Barrus, who estimated 2 percent loss. Pennsylvania estimated 1.5 percent, and Indiana a trace. Illinois and Montana each estimated 10 percent loss. Indiana, Michigan, Iowa, North Dakota, Washington, and Oregon each reported less than 1 percent. Drought and heat injury caused considerable losses in 1939. Indiana, North Dakota, and Arizona, each reported 10 percent; Wisconsin, 5 percent; Oregon, 4 percent; Washington, 3 percent; Arkansas, 2 percent; and Iowa 25 percent (includes insect injury).

BARLEY. See HORDEUM VULGARE.
CORN. See ZEA MAYS.
FLAX. See LINUM USITATISSIMUM.

HORDEUM VULGARE. BARLEY:

Ascochyta graminicola, leaf spot, was reported by the Natural History Survey as causing 12 percent loss in one field in Monroe County, Illinois.

Claviceps purpurea, ergot, was observed in Wisconsin, Minnesota, and North Dakota.

Erysiphe graminis, powdery mildew, was reported by K. D. Butler and M. F. Barrus as being more prevalent in New York on spring barley than last year -- 10 percent loss was estimated. Other losses were Oregon 3 percent (PDR 23:221); Washington, 2; Virginia, 1.5 (PDR 23:97); and North Carolina, 1; while Pennsylvania, Maryland, Texas, Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, and Idaho estimated less than 1 percent. At University Farm, Davis, California, C. A. Suneson reported that mildew injured barley severely up until heading time and then subsided.

Gibberella zeae, scab, was reported in Pennsylvania as causing a trace loss; in Maryland as of the usual prevalence; in Virginia as less prevalent than for several previous years, owing to the dry, cool weather, according to Matheny and Fenne who estimated the loss at 1 percent. North Carolina also estimated 1 percent and Maryland 1.5 percent. In Ohio R. C. Thomas reported scab the most serious disease on barley this year, and estimated the loss at 1.5 percent. In Illinois the Natural History Survey reported the disease as more prevalent than in 1938, especially in the north: "Average prevalence 43.1 percent of plants and 9.1 percent of spikelets infected, estimated reduction in yield 9 percent." J. H. Muncie reported a total estimated loss of 0.5

percent in Michigan "Wet July in many sections favored infections." In Wisconsin, R. E. Vaughan reported that scab was more prevalent than for several previous years, "General infection was early but little damage resulted to commercial quality as blighted kernels were very light and choppy," estimated loss 1 percent. Iowa reported 4 percent loss and North Dakota a trace.

Helminthosporium gramineum, stripe, was reported less prevalent generally than during 1938. According to the Natural History Survey, stripe in Illinois was more prevalent than last year, 1 percent reduction in yield was estimated. States reporting more than 1 percent loss were Maryland, 3 percent and North Carolina, 2 percent. A trace was noted in the 14 other States reporting. H. sativum, spot blotch, was reported rather common on winter barley in New York, but apparently did not cause much damage. The highest losses reported from 11 States were 1.5 percent from Iowa and 1 percent each from North Carolina and North Dakota.

Phytomonas translucens, bacterial blight. Scattered distribution in Minnesota according to J. J. Christensen.

Puccinia spp., leaf rusts: P. anomala in New York, according to K. D. Butler and M. F. Barrus caused a possible reduction in yield of 5 percent in spring barley and a trace in winter barley, which was less than last year. R. S. Kirby in Pennsylvania reported "An average of 4.8 percent infection found in the 25 fields surveyed for leaf rust." In Virginia, leaf rust was observed on barley in Powhatan County on March 21 and in Frederick County on March 23 (PDR 23:97). W. D. Valleau reported leaf rust at Lexington, Kentucky well established on the lower leaves May 7. Texas, 10 percent loss in Hidalgo County. Illinois reported 10 percent reduction in yield. The maximum infection in any one field was "100 percent of plants infected and 39.3 percent of leaf area diseased. Average prevalence 99.1 percent of stems and 25.8 percent of leaf area." Wisconsin reported 0.5 percent loss, which was more than last year. Minnesota reported no loss. P. rubigo-vera tritici, wheat leaf rust, caused an estimated loss of 2 percent in Delaware and 1 percent in North Carolina. Pennsylvania, Iowa, Washington, and Oregon each reported a trace. P. graminis tritici, stem rust, was of slight importance this year as compared to 1937 and 1938. Minnesota was the only State reporting as high as 1 percent loss.

Pyrenophora teres, net blotch, in Ingham County, Michigan was reported by R. W. Lewis as plentiful, every plant was infected. Less prevalent in Wisconsin than usual, owing to the dry weather late in season. Illinois reported the disease more prevalent than in 1938. Maximum infection in any one field was "37 percent of plants and 2.8 percent of leaf area destroyed. An average of 22 percent of plants were infected and 0.9 percent of leaf area was destroyed." It was observed in Payne County, Oklahoma, according to K. S. Chester.

Rynchosporium secalis, scald, was found in small amounts in a very few fields in Michigan, according to J. H. Muncie. In Wisconsin, R. E. Vaughan reported that the disease has become of very limited occurrence on barley. J. J. Christensen reported it as less prevalent in Minnesota.

Ustilago hordei, covered smut, was reported less prevalent generally than in 1938, except Pennsylvania, where a 7 percent reduction in yield was noted. Other losses were Maryland, 3.5 percent; Virginia, Oklahoma and Arizona, 3; Iowa, 2; Kansas, 1.8; Illinois, 1.7; New York, Ohio, North Carolina, and Texas 1; 9 other States reported less than 1 percent. Ustilago spp., including U. nuda and U. nigra, loose smut. The highest loss estimate was 20 percent in Delaware. Other estimates were Pennsylvania, 4; Maryland, 3; Virginia, Oklahoma, and Texas, 2; Kansas, 1.5; Illinois, 1.1; North Carolina, Ohio and Iowa, 1; New York, Indiana, Michigan, Wisconsin, Minnesota, North Dakota, Washington and Oregon reported less than 1 percent.

LINUM USITATISSIMUM. FLAX:

Alternaria sp., and other Fungi Imperfecti, boll disease and seed blight, caused a 2 percent reduction in yield in Minnesota, according to J. J. Christensen. Colletotrichum lini, anthracnose, was reported common on certain lots of seed in Minnesota, according to J. J. Christensen Fusarium lini, wilt, caused a trace loss in Wisconsin. J. J. Christensen reported 1 percent loss in Minnesota. In North Dakota the Department of Plant Pathology pointed out that resistant varieties were generally grown--1 percent loss was estimated. Kansas (PDR 23:367); first report from Oregon (PDR 23:207). Melampsora lini, rust, was observed in Texas, Wisconsin, Minnesota, Iowa, North Dakota, and Kansas, (PDR 23:367) and in Montana on L. lewisi. Pythium sp., damping-off, in Iowa caused 10 percent reduction in yield according to C. S. Reddy. Sphaerella linorum, pasmo, Hidalgo County, Texas, 25 percent loss. Wisconsin, scattered distribution. J. J. Christensen in Minnesota reported severe infection in localized areas. Iowa (PDR 23:367). Heat canker (non-par.). Oklahoma, North Dakota and Montana (PDR 23:367).

ORYZA SATIVA. RICE:

Cercospora oryzae, leaf spot, in Louisiana was reported in every field of Blue Rose. The most susceptible varieties were Blue Rose and Early Prolific, but the latter matures before disease becomes severe, according to T. C. Ryker. The disease occurred in 5 counties -- estimated loss was 1 to 2 percent. E. M. Cralley, in Arkansas stated that promising hybrid selections had been developed in cooperation with the U. S. Department of Agriculture. Curvularia lunata, black kernel. C. E. Minarik reported that rice in the Eagle Lake, Garwood and Katy sections of Texas showed light to medium infection. Entyloma oryzae, black leaf smut. Louisiana and Texas. Leptosphaeria salvinii (Sclerotium oryzae) stem rot, in Louisiana was reported less prevalent than for several previous years. E. M. Cralley, in Arkansas reported that promising resistant hybrid selections had been developed in cooperation with the U. S. Department of Agriculture.

Ophiobolus miyabeanus (Helminthosporium oryzae), leaf and glume spot, according to T. C. Ryker in Louisiana, "for some unexplained reason was very late in making its appearance even in fields that are severely affected every year. There was rapid increase between June 19 and July 10, after that it reached the usual severity. He estimated 1 to 2 percent reduction in yield. Loss from stink bug, this fungus and others was approximately $250,000 based on actual check made in 1937 by W. A. Douglas. Also reported from Arkansas and Texas.

Piricularia oryzae, blast, leaf spot and rotten neck. Blast and leaf spot as reported by Ryker were less prevalent in Louisiana than in 1938, found only on virgin land. In Arkansas, E. M. Cralley said indications were that Zenith, a new selection, is more resistant than other commercial varieties. Rhizoctonia oryzae, sheath spot. T. C. Ryker reported the usual prevalence in Louisiana. R. solani was said to be less prevalent than usual in the same State. The usual prevalence was observed in Arkansas. Tilletia horrida, smut. Louisiana, "Rexoro appears to be the only variety affected." Less prevalent than in 1938. In Texas, C. E. Minarik reported the disease general in Brazoria County on Rexoro variety. There was considerable loss in certain fields.

Straighthead (non-par.) was reported more prevalent in Arkansas than in 1938. Leaf blotch (sterile fungus). Less prevalent in Louisiana than for several previous years. The disease has been found on a number of wild plants including both monocots and dicots. The fungus has not been observed to fruit under Louisiana conditions. Drayton in Canada did succeed in getting it to fruit. It belongs to the inoperculate discomycetes. (T.C.Ryker). White tip (non-par.) was less prevalent in Louisiana than in 1938 or in an average year. Frequent rains and cloudy weather during the early growing season prevented water from getting as hot as usual. This seemed to inhibit the disease. Because Early Prolific matures early it was not affected by white tip to any extent (T.C.Ryker).

RICE. See ORYZA SATIVA.
RYE. See SECALE CEREALE.

SECALE CEREALE. RYE:

Claviceps purpurea, ergot, was generally less prevalent than for several previous years. The highest loss, 1 percent, was reported from Wisconsin. Colletotrichum graminicolum, anthracnose, was also reported less prevalent than during 1937 or 1938. Losses were estimated at 4 percent in Pennsylvania, and 0.1 percent or traces in other States. Erysiphe graminis, powdery mildew, was reported by M. F. Barrus, as of very little importance in New York. Gibberella zeae, scab, was less prevalent in Wisconsin than for several previous years owing to the dry weather. Illinois reported scab much less prevalent than during 1938.

Puccinia graminis secalis, stem rust, was reported less prevalent than in 1938. Massachusetts reported the highest loss, which was 1 percent. Traces were reported in other States. P. rubigo-vera secalis, leaf rust, was generally less prevalent than last year. The highest losses were: Pennsylvania, 3 percent; Oklahoma, Arkansas, Illinois, and Wisconsin each 1 percent. Other States reporting estimated a trace loss. Rynchosporium secalis, scald, was reported only from Illinois, where a loss of 2 percent was estimated. Urocystis occulta, stem smut, was not an important disease in 1939, the highest estimated loss being 0.3 percent in Illinois. Ustilago hordei, head smut, Washington, in the Pullman Nursery Unit of the Soil Conservation Nurseries, at Pullman. First report from the United States (PDR 24:112).

SORGHUM VULGARE. SORGHUM:

Erwinia lapsa, stalk rot, was reported by P. A. Ark in San Joaquin County, California. Fusarium sp., root rot. Oklahoma. Helminthosporium turcicum, leaf spot. Texas. Phytomonas andropogoni, leaf spot. Texas. Pythium arrhenomanes, root rot (milo disease), was reported as general in north and west Texas. It is known to occur in south and east Texas also. In Kansas, L. E. Melchers reported "This disease appeared for the first time this season in the botany sorghum nursery, at Manhattan." J. B. Kendrick in California reported much less disease due to general planting of "Double Dwarf Yellow 38", a highly resistant variety, which was released by the University of California Agricultural Experiment Station in 1938.

Sclerotium bataticola, charcoal rot, Oklahoma (PDR 23:247). In Texas the disease became serious near Chillicothe in Hardeman County and was bad in one field in Jackson County. In Kansas L. E. Melchers reported the disease found in plots at Garden City and Hays. "Undoubtedly it has been present in Kansas for years. I have seen what appears to be this in connection with corn root and stalk rots. It is associated with unfavorable growing conditions."

Sphacelotheca sorghi, covered kernel smut, was reported from two counties in Texas causing from a trace to 1 percent loss; Wisconsin, no loss; in Kansas fields varied from 0 to 30 percent loss, according to J. O. Miller, North Dakota.

TRITICUM AESTIVUM. WHEAT:

Anguina tritici, wheat nematode, was reported from Virginia as causing 1 percent loss, and from Georgia (PDR 23:323). Cercosporella herpotrichoides, foot rot, Washington (PDR 23:220). Claviceps purpurea, ergot, was said to be present in Wisconsin, Minnesota and North Dakota.

Colletotrichum graminicolum, anthracnose, in Illinois was generally present, especially in the southern part of the State. Three records show: Massac County, 43 percent of plants infected in 20 acres; Saline County, 6 percent in 20 acres and Wabash County 17 percent in 15 acres (Illinois State Natural History Survey). Erysiphe graminis, powdery mildew, was relatively unimportant in the 7 States reporting, except New York, where a reduction in yield of 4 percent was noted. Butler and Barrus pointed out that the disease was found all winter in the greenhouse. It was also found April 1 in a field at Ithaca. Mild winter and long cool spring were apparently favorable for mildew.

Foot rots and root rots and seedling blights caused by various organisms: Cercosporella herpotrichoides, cercosporella foot rot, in Washington caused very little damage in the region of the Columbia Gorge (PDR 23:220). Fusarium spp. and Helminthosporium spp. including H. sativum were reported from Pennsylvania and Wisconsin causing a trace loss; Oklahoma 3 percent; Texas, 2; Iowa 15; North Dakota, 1; Nebraska; Kansas (PDR 23:282); Montana, 1; Washington, 0.4 and Oregon, 0.5. Ophiobolus graminis, take-all, was reported from 8 western counties in New York, and was rather common in Ontario County. The estimated loss for the State was 0.5 percent; Delaware (PDR 23:370-371); Pennsylvania, Kansas (PDR 23:282) and Washington a trace; Oregon (PDR 23:220). Pythium sp., foot rot, was reported causing a widespread disease condition in the Panhandle of Texas last spring. Cultures of two different species of Pythium were obtained from the roots.

Gibberella zeae, scab, caused slight losses in most of the 16 States reporting, owing to the dry season. Maryland, West Virginia, and Minnesota each reported 2 percent loss; Ohio, 1.5 percent, less than normal in northern portion of State but above normal in southern portion (R. C. Thomas); Virginia, North Carolina, Illinois, and Iowa each reported 1 percent. Other States reported less than 1 percent.

Marasmius tritici, mushroom death, was reported by the Illinois Natural History Survey as general in the southern part of the State causing a trace loss. They reported Naucoria cerealis as less prevalent than for several years, only a trace was found in a 10-acre field in Pulaski County.

Phytomonas atrofaciens, basal glume rot, was reported less prevalent than last year in Illinois. P. translucens undulosa, black chaff, was reported from Texas, Oklahoma, Illinois, and North Dakota causing a trace loss. Iowa reported 0.1 percent loss.

Puccinia glumarum, stripe rust, was unimportant as compared to 1938 according to the Washington Department of Plant Pathology; it was observed in Whitman County. The disease did not cause much damage in California.

P. graminis tritici, stem rust: Losses from stem rust in 1939 were insignificant as compared to 1935 and 1937, or even 1938. The

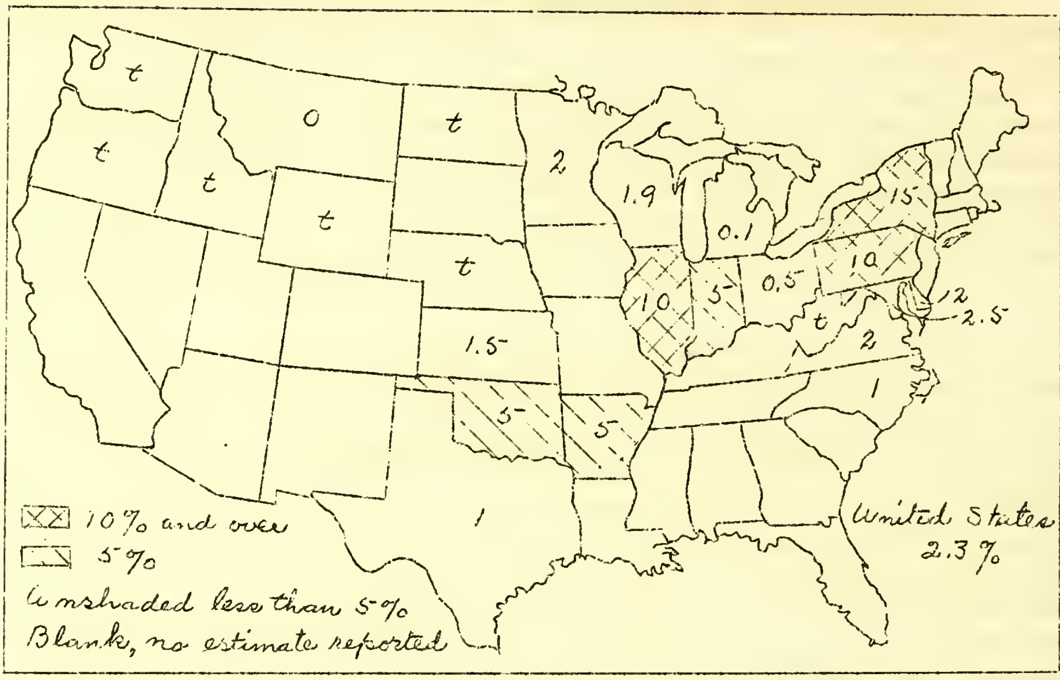

Fig. 21. Estimated percentage losses from leaf rust of wheat in 1939.

greatest loss, 2 percent, was reported in Virginia which is less than for several years. In West Virginia the loss was estimated at 1 percent, elsewhere it was negligible. In Minnesota, J. J. Christensen reported a "Decrease in loss because nearly all spring wheat in Minnesota is Thatcher." C. A. Suneson, in the Western Region, said, "Stem rust, widespread and severe over much of the region last year, was not even seen outside California this year" (PDR 23:283).

P. rubigo-vera tritici, leaf rust, was reported generally less or much less prevalent (Fig. 21) than in 1938. Early infections were comparatively light as compared to last year. In some States leaf rust was present in every field but did not make much progress, owing to the dry weather. In Illinois, the Natural History Survey reported the maximum infection in any one field "100 percent of plants and 63.8 percent of leaf area. Average prevalence, 100 percent of plants, and 28.9 percent of leaf area." C. O. Johnston, in Kansas reported (PDR 22:463) that despite the drought considerable leaf rust infection was observed on volunteer wheat in the fall of 1938, which probably originated from oversummering urediospores rather than from spores blown in from the North. Later, (PDR 23:75) low temperatures and dry weather drastically reduced the amount of overwintering with the result that in 1939 heavy infections did not develop until late in the season, and since unfavorable weather conditions ripened most of the wheat before severe damage was done, heavy losses occurred only on late wheat in the north central part of the State. Leaf rust overwintered in California, but apparently did not do any damage.

Septoria nodorum, glume blotch, was reported causing less damage this year than in 1938. The highest losses were, Pennsylvania 2 percent and Maryland 1 percent. Slight losses or none were reported from other States. S. tritici, speckled leaf blotch, was also reported causing less damage in 1939 than in 1938. The highest loss reported was 1.5 percent in Illinois as compared to 6 percent for the last two years. Oklahoma reported 1 percent, Oregon 0.9 and Washington 0.3. Six other States reported less. Minnesota and Montana reported no loss.

Tilletia levis and T. tritici, bunt, was reported generally less prevalent than for the past two years. Losses of 1 percent or more estimated this year include 5 percent in Arizona and North Carolina, 3 in Ohio and Washington, 2.4 in Pennsylvania, 2 in Maryland, Virginia and Oklahoma, and 1 in New York, Delaware, Michigan, Wisconsin, Idaho and Wyoming. Twelve other States reported less. (PDR 23:220, 262). In Pennsylvania, R. S. Kirby reported an average of 2.38 percent found in 65 untreated fields surveyed. None was found in 17 treated fields. R. C. Thomas in Ohio pointed out that the disease was most severe in the western portion of the State. Apparently there was not general interest in seed treatment. In Nebraska, R. W. Goss stated that approximately 2,000 lots of seed tested at Lincoln showed only 1 percent of them to be infected, but dry conditions of fall plantings decreased infection. The disease was more severe in spring wheat.

Ustilago tritici, loose smut, was reported more prevalent than last year in some States. The highest loss estimated was 4 percent in Oklahoma; Texas, Maryland, West Virginia, and North Carolina reported 2 percent; Indiana and Kansas 1.5 percent; Illinois 1.1 percent; Virginia 1 percent; 13 States reported less than 1 percent. In Nebraska, R. W. Goss said, "About 18 percent of the 2,000 lots of seed tested contained from a trace to 2 percent infection." In south central and southeast Kansas, C. O. Johnston reported up to 35 percent infection on some varieties. In southeast and south-central Kansas, J. C. Miller reported as high as 33 percent infection on the Clarkan variety.

Mosaic (virus) was reported by R. M. Caldwell in Indiana as causing a trace loss. The most susceptible varieties were Purkoff and Purdue No. 1.

Weather injuries: Winter injury was reported causing a trace loss in Indiana, 2 percent in Washington and 4 percent in Oregon. Drought and heat injury caused the following estimated losses: Arizona 25 percent; Iowa 22.5 percent (this includes insect injury); North Dakota and Washington 10 percent; Arkansas and Oregon, 5 percent.

WHEAT. See TRITICUM AESTIVUM.

ZEA MAYS. FIELD CORN:

Diplodia spp., ear and stalk rot, was reported more prevalent than in 1938 in Louisiana, Ohio, Indiana, Illinois, Wisconsin, and

Minnesota. In Louisiana, E. C. Tims reported 2 percent loss; R. C. Thomas reported this the most severe disease of corn this year in Ohio, especially in the southern part of the State, estimated loss was 4.5 percent. In Illinois, R. R. Cooper and others (Sixth annual Illinois corn performance tests, 1939. Illinois Agr. Exp. Sta. Bull. 463. 1940) reporting on ear rots (p. 179) said: "Frequent moderate rains during the first half of summer made conditions ideal not only for corn growth but also for Diplodia infection. When the ears were in the milk stage, an alarming number of plants died from Diplodia rot in some fields. Unusual losses in yield, resulting from ear rot, were expected but a change to dry weather after early August checked this tendency, making State losses somewhat below the average of the last fifteen years....... The rot damage in 1939 was caused principally by Diplodia.......The low losses in Illinois from ear rots during the last few years must be attributed in large part to seasonal conditions and other environmental factors rather than entirely to planting of a greater acreage to hybrids.'

"The appearance of stalk rot (p.176) and the dying of plants occurred in 1939 at about the same dates as in 1938, but the damage to yield was considerably less. One probable reason for this fact was the unusually fast growth of the corn plants and the development of the ears earlier than in a normal season; another reason was that Stewart's disease caused less damage than in 1938." (See also PDR 23:337; 24: 210-213). The Illinois Natural History Survey reported a reduction in yield of 6.5 percent; Wisconsin, Minnesota, and Virginia each reported 1.5 percent; Delaware, 3 percent; North Carolina, Texas, Oklahoma, and Iowa each reported 1 percent; Pennsylvania, Michigan, and Washington reported less than 1 percent.

Ear rots caused by various organisms: Relative prevalence of corn ear rot fungi in the 1939 crop, as indicated by samples from car-load lots of known origin, was reported by P. E. Hoppe (PDR 24: 210-213). Incidence as shown by receipts at terminal markets, reports of corn performance tests and cooperative uniform comparisons of corn hybrids, was very low again this year according to Neil E. Stevens (PDR 24:413-416.)

Aspergillus spp., according to Hoppe, were found in plated samples from Illinois, Minnesota, Iowa, Missouri, Nebraska, and Kansas, but did not occur in samples from Maryland, Delaware, Ohio, Indiana, South Dakota, and Colorado. In Illinois, the State Natural History Survey reported this fungus as less prevalent than last year or in an average year, the standard count of 200 ears per field was not sufficient to show 1939 prevalence. Averages for positive observations were, A. niger 0.43 percent, A. ochraceus 0.5 percent, found in 3 and 1 fields respectively.

Cephalosporium acremonium, black bundle disease, although less prevalent than usual in Illinois, caused a loss of 5 percent, according to the State Natural History Survey. This loss is "Based on field-sympto complex recognized in previous years. An average of 13.5 percent of plants were infected with 3.5 percent barren, based on examination of 10,400 stalks." Pennsylvania estimated 1 percent loss, Michigan 0.1 percent and Texas a trace.

Erwinia carotovora, (Bacterium dissolvens), bacterial stalk rot. Kentucky (PDR 23:249). In Illinois, according to the State Natural History Survey, two fields were examined in Alexander County. One had a trace, the other 0.75 percent, of the plants infected. In the 2 fields examined in Pulaski County no stalk rot was found. E. lapsa, stalk rot, was reported in Butte County, California by C. E. Scott.

Fusarium spp. were reported cuasing less damage than in 1938. The highest estimate of loss was 6 percent in Louisiana; Oklahoma reported 2 percent; Virginia, 1.5; Delaware, West Virginia, North Carolina and Ohio 1 percent; Indiana, Illinois, Michigan, Wisconsin, Iowa, and North Dakota reported less than 1 percent. F. moniliforme, according to Hoppe, was obtained in platings of damaged kernels from carload lots from each of the 13 States included in the survey.

Gibberella zeae (formerly reported as G. saubinetii), according to reports, was even less prevalent than in 1937 or 1938. Only slight losses were reported by collaborators from Ohio, Indiana, Illinois, Michigan, Wisconsin, and Iowa.

Nigrospora sphaerica in Illinois was reported less prevalent than last year and much less prevalent than in an average year by the State Natural History Survey. Of 14,900 ears examined, only 0.5 percent were found diseased. The estimated reduction in yield for the State was 0.2 percent. According to R. E. Vaughan this organism in Wisconsin was much less prevalent than for several previous years, owing to the early maturity of the crop, which is a factor unfavorable for its development. Ohio, Wisconsin, and Iowa reported traces. Hoppe reported the fungus of slight importance in the 1939 samples, just as was the case in 1938.

Penicillium spp. were reported from Illinois as less prevalent than for several previous years. Wisconsin reported much less, "Early maturity of corn resulted in a minimum of ear rot diseases associated with the immature crop." Hoppe found them most frequently associated with samples originating in Minnesota. Rhizopus sp. was reported less prevalent in Illinois than in 1938.

Stalk rot caused by various fungi other than Diplodia (some undesignated) caused the usual amount of damage, Fusarium spp. were most often designated as the causal organisms -- these were reported from Virginia, Ohio, Wisconsin, and Iowa, with slight losses. Oklahoma and Arizona reported 2 percent loss and Texas 1 percent.

Gibberella and Nigrospora infection came late in Minnesota, according to Christensen -- yields were good, but stalks broke making harvest difficult. Sclerotium (Rhizoctonia) bataticola was reported from the southern third of Illinois causing a trace loss. Christian County was the most northern record. (PDR 23:312-321). Various stalk rots were found in Ohio (PDR 23:342) and Maryland. Pythium butleri was reported from Texas again this year causing a trace loss.

Foot rot, root rot, caused by various fungi. Fusarium and Gibberella were the most widely reported. The highest loss estimated for Fusarium was 2 percent in Oklahoma, and for Gibberella, 1 percent in Virginia. Other fungi reported include Penicillium from Massachusetts, Virginia, Michigan, and Minnesota; Pythium from Massachusetts and Iowa -- the latter State estimated 4 percent loss, which was less than last year; and an undetermined fungus which was estimated causing 6 percent loss in Louisiana.

Helminthosporium spp., leaf blight. Ohio (PDR 23:342). In Indiana A. J. Ullstrup reported, "This disease only on inbred Pr, where approximately 70 percent reduction in yield sustained. It was not important on the crop as a whole." H. turcicum in southwest Virginia was reported by S. B. Fenne as being much more prevalent than for several previous years, the estimated reduction in yield was 4 percent. In Indiana, A. J. Ullstrup reported that all varieties and hybrids appeared to be equally susceptible, a trace loss was estimated. Other States reporting were Massachusetts, Illinois, Michigan, Minnesota, Montana, and Oregon.

Mucor spp. according to P. E. Hoppe (PDR 24:212) appeared in samples of corn from Maryland, Delaware, Ohio, Indiana, Illinois, Minnesota, Iowa, Missouri, South Dakota, Nebraska, Kansas, Colorado, and Texas.

Physoderma zeae-maydis, brown spot, caused losses estimated at 1 percent in North Carolina and traces in Louisiana, Oklahoma, and Illinois.

Phytomonas stewartii, bacterial wilt, was generally less prevalent than during 1938. The highest estimate reported was 3.5 percent for Ohio. R. C. Thomas pointed out that this disease was considered the second most important in the State; however, it was less prevalent than last year, but more prevalent than in an average year (PDR 23:342; 24:124). West Virginia reported 1 percent loss. Other States reporting losses were Maryland and Iowa 0.1 percent and traces from Pennsylvania, Virginia, Texas, Oklahoma, Indiana, and Illinois. (PDR 23:337); and "small loss" from New York.

Puccinia sorghi, rust, as usual, was widespread in occurrence but caused slight loss or none, the only estimates of more than a trace reported being 0.1 percent from Maryland and Michigan.

Ustilago zeae, smut, according to crop loss estimates and other reports was generally less damaging than in 1938. Loss estimates of

1 percent or more are: 10 percent in Arizona; 4 in Pennsylvania and Iowa; 3 in Oklahoma and Minnesota; 2.5 in Wisconsin; 2 in North Carolina, North Dakota and Wyoming; 1.5 in Virginia, West Virginia, Illinois, and Kansas; 1 in Massachusetts, Delaware, Maryland, Texas, and Indiana.

Drought and heat injury caused considerable injury in some States. Losses estimated are: 50 percent in Arkansas; 15 in Texas; 7.5 in Delaware; 6 in Iowa; 5 in North Dakota; 2 in Washington and Oregon; and a trace in Wisconsin.

ZEA MAYS. POPCORN:

Phytomonas stewartii, bacterial wilt, in Indiana, according to Glen Smith (PDR 24:125) was bad on some popcorn varieties. Sorosporium reilianum, head smut, was observed in Spokane County, Washington, according to the State Department of Plant Pathology.

ZEA MAYS. SWEET CORN:

Diplodia spp., ear and stalk rot, was reported from 11 States. The highest estimated reduction in yield was 5 percent in Iowa. Maryland reported 2 percent; Delaware, North Carolina and Minnesota, 1 percent; Indiana, 0.5 percent; Michigan 0.1 percent; and traces from Pennsylvania, Ohio and Washington. Diplodia sp., Fusarium spp., Gibberella sp., etc. Foot rot and seedling blight was less important this year than in 1938, judging from reports received by the Survey. The highest losses were 2 percent in Massachusetts and 1 percent in Maryland; 4 other States reported traces. Helminthosporium turcicum, leaf blight, caused slight losses in Maryland, Ohio, Michigan and Oregon.

Phytomonas stewartii, bacterial wilt: Incidence of bacterial wilt of sweet corn in 1939 is reported rather fully in the Reporter (PDR 24:122-129). Of the 11 States reporting incidence of wilt, Pennsylvania, Indiana and Illinois (Copper, R. R. et al. Ill. Agr. Exp. Sta. Bull. 463. 1940 p. 177) reported more than last year, and Massachusetts, Connecticut, Ohio and Iowa reported less. Percentage losses were estimated as follows: Pennsylvania, 5; Ohio and Indiana, 2; Maryland and West Virginia 1; Illinois, 0.3; Iowa, 0.1; Connecticut, Massachusetts and New York a trace.

Puccinia sorghi, rust, caused little damage. Traces were reported in Massachusetts, New York, Maryland, Indiana, Michigan and Iowa. Ustilago zeae, smut, was less prevalent than last year in many of the 20 States reporting. States reporting losses of 1 percent or more were: Arizona, 10; Iowa, 8; Wisconsin, 5; Massachusetts and Pennsylvania, 4; Minnesota and North Dakota, 3; New York, Delaware, and West Virginia 2; and Maryland 1.5. In New York Charles Chupp reported almost an epidemic this season. The hot weather seemed to favor the disease.

DISEASES OF FORAGE AND COVER CROPS

HELIANTHUS ANNUUS. SUNFLOWER:

Erysiphe cichoracearum, powdery mildew, and Puccinia helianthi, rust, were collected in Atascosa County, Texas by P. A. Young.

LEGUMES

LESPEDEZA spp. BUSHCLOVER:

Rhizoctonia bataticola, charcoal rot, was observed on Korean lespedeza (L. stipulacea) in Illinois (PDR 23:315). Sclerotium rolfsii, sclerotial wilt, on Korean lespedeza was reported from Arkansas by Paul H. Millar. Determination of the fungus was made by H. W. Johnson. Uromyces lespedezae-procumbentis, rust. Oklahoma.

MEDICAGO SATIVA. ALFALFA:

Ascocyta imperfecta, black stem. New Mexico (PDR 23:328). In Kansas D. B. Creager reported this disease very severe on lower leaves, older ones were defoliated and spots were very abundant on leaves and small lesions on stems. It was observed as early as April 6.

Cercospora medicaginis, leaf spot. The Natural History Survey of Illinois reported in one field 87.7 percent of plants diseased, and 17.4 percent of the leaves. Average prevalence 60.5 percent of plants and 10.6 percent of leaves diseased. In Michigan, R. W. Lewis reported the disease was found only in Oakland County.

Colletotrichum destructivum, anthracnose, was found in a nursery at Griffin, Georgia during August (PDR 24:30), also reported from Ohio in earlier summer. C. graminicolum, anthracnose, Kentucky and Ohio (PDR 24:30). C. trifolii was reported from New Mexico by Wm. G. Hoyman. According to the Plant Disease Survey records this anthracnose was first reported in New Mexico in Chaves County in 1919 by L. H. Leonian (PDR 23:328).

Cuscuta arvensis, dodder, was collected in Arizona, July 19. Evidence points to contaminated seed according to J. G. Brown.

Ditylenchus dipsaci, stem nematode, was reported from Riverside County, California by C. E. Scott.

Fusarium oxysporum medicaginis, root rot, was reported again this year in Nebraska. Peronospora trifoliorum, downy mildew, was reported from Wisconsin, Kansas, New Mexico and Washington. Phymatotrichum omnivorum, root rot, New Mexico (PDR 23:328); Texas, severe damage in Valverde County and 3 percent loss in Bell County; in Arizona, J. G. Brown reported the disease common, with occasional specimens sent in from adjacent Old Mexico.

Phytomonas insidiosa, bacterial wilt, was reported more prevalent in Massachusetts than last year. In New York according to W. H. Burkholder the disease was probably much more important than realized. Reported from Oklahoma. In Michigan, J. H. Muncie reported many fields partly killed directly by wilt or by wilt and winter injury, the loss being estimated at 50 percent. R. E. Vaughan reported from Wisconsin that the range of the disease was extended further north to the north central part of the State. The usual prevalence was reported from Minnesota. Iowa reported a loss of 5 percent, less prevalent than last year. In Washington the disease was said to be of major importance: "Bacterial wilt has been found to be generally prevalent and to be playing an important part in gradually reduced stands in the Yakima Valley and the Okanogan Valley, but is absent from the Methow Valley." (Wash. Bull. 384: 62. p.57. 1939, Rept. 1938-39).

Pseudopeziza medicaginis, leaf spot, was much less prevalent in Massachusetts owing to the dry season; generally distributed over New Jersey; in Pennsylvania, R. S. Kirby reported a 4 percent reduction in yield; the Illinois Natural History Survey reported "Prevalence in Bureau County, 27 percent of plants with 15 percent of leaves diseased. Jersey County, 42.7 percent of plants with 39 percent of leaves diseased"; Michigan, trace loss; Wisconsin, less prevalent than last year owing to dry weather; Minnesota, generally distributed, more prevalent than last year or in an average year; North Dakota, "Not observed this year"; Iowa, 5 percent reduction in yield; New Mexico (PDR 23:328); Washington.

Pyrenopeziza medicaginis, leaf spot, was reported from Illinois. W. F. Buchholtz reported a trace loss in Iowa. In Kansas, according to D. B. Creager the disease was rather severe on lower leaves in the variety Kansas Common at the time of cutting; many leaves were yellowed, bearing greenish blotches extending from midribs towards margins. Reported from Washington.

Sclerotinia trifoliorum, crown rot, was reported very prevalent and severe in one planting in New Jersey; Washington.

Uromyces striatus, rust, was reported from Illinois. Rust was reported by Chester in Oklahoma as being severe in individual fields. It was generally present in most fields, but only rarely caused the defoliation frequently observed this year. In Michigan it was collected only in Oakland County--some on every plant according to R. W. Lewis. The disease caused considerable damage to the first crop in Iowa, where the estimated reduction in yield was 10 percent. In Kansas

D. B. Creager wrote that rust was observed July 17 in leaf and stem disease nursery at old Rifle range. From appearance of pustules primary infection must have appeared 7 to 10 days before. C. O. Johnston reported it heavy on seed crop at several points late in the season (September - October). New Mexico (PDR 23: 328).

Mosaic (virus). Chester reported mosaic very general in Oklahoma, fields often showed 100 percent infection, usually of a rather mild type. Witches' broom (virus). Washington, "Cultures under greenhouse conditions have demonstrated the virous nature of the witches' broom.......Witches'-broom has been especially serious in the Methow Valley, generally present in the Yakima Valley, but rare or absent in the Okanogan Valley." (Wash. Bull. 384: 57, 1939. Rept. 1938-39). Winter injury. North Dakota reported 10 percent loss. Washington.

MELILOTUS spp. SWEET CLOVER:

Ascochyta caulicola, stem blight, was reported less prevalent in Wisconsin owing to the dry weather. *A. lethalis*, black stem, was reported from Campbell County, Virginia by S. B. Fenne. This is the first report on this host from Virginia; also reported from North Dakota for the first time. *Phytophthora megasperma*, root rot, was reported less prevalent in Wisconsin owing to dry weather. ? *Colletotrichum destructivum*, anthracnose, on *M. alba* in Wisconsin (PDR 24:30). *Ascochyta* spp., leaf spot and stem rot, and *Fusarium* spp. root rot, were reported on white sweet clover in Minnesota. *Phymatotrichum omnivorum*, root rot, Texas (PDR 23:206).

Mosaic (virus). Oklahoma, on *M. alba*, "Common along roadsides, more than one strain is present." Minnesota on white sweet clover, "Severe on certain self-lines."

(SOJA MAX.) SOYBEAN: GLYCINE SOJA:

Peronospora manshurica, downy mildew. In Brown County, Illinois there were about 75 percent of volunteer plants in a wheat field infected according to the Natural History Survey. In Michigan, R. W. Lewis reported collections made in Oakland County. *Diaporthe* (*Phomopsis*) *sojae*, stem blight, was reported in Winnebago County, Illinois, "3.2 percent of plants in one field were infected." *Phytomonas glycinea*, bacterial leaf spot. In Richland County, Illinois, the Natural History Survey reported in one field "100 percent of plants infected with an average of 89 spots per leaf on June 23." *Rhizoctonia bataticola*, charcoal rot. Illinois (PDR 23:312); California (PDR 23:25).

Mosaic (Soja Virus 1). In Whiteside County, Illinois, approximately 33 percent of plants in one field were infected on July 14 according to the Natural History Survey.

STROPHOSTYLES HELVOLA. TRAILING WILD BEAN:

Macrophomina phaseoli, ashy stem blight, was reported by Howard W. Johnson, from the Soil Conservation Nursery near Americus, Georgia. This is a new host record for the fungus according to the records of the Plant Disease Survey (PDR 23:138).

TRIFOLIUM spp., CLOVER:

Cercospora zebrina, leaf spot, was reported from Illinois on *T. pratense*. R. W. Lewis reported the disease present in Ingham County, Michigan. Usual prevalence was reported in Minnesota on *T. hybridum* and *T. pratense* by J. J. Christensen. *Colletotrichum graminicolum*, anthracnose, was reported from Kentucky on red and white clovers (PDR 24:30). *Erysiphe polygoni*, powdery mildew. Illinois, average infection for 2 fields of red clover examined, as reported by the Natural History Survey was 56.3 percent of plants and 24.4 percent of leaves. The maximum infection in any one field was 99.67 percent of plants and 59.75 percent of leaves. Michigan in Ingham County. Wisconsin and Iowa reported a trace loss. Minnesota, Missouri, and Washington made reports on red clover.

Heterodera marioni, root knot nematode, caused greatly reduced yields in Virginia (PDR 23:98).

Kabatiella caulivora, anthracnose, was reported less prevalent in Wisconsin owing to the dry weather. Minnesota reported the same prevalence as last year. *Phyllachora trifolii*, sooty spot, was observed in Minnesota on *T. pratense* and *T. repens*, in Michigan on *T. hybridum*, and in Washington on *T. repens*. *Phytomonas cerasi*, bacterial leaf spot, was reported in Michigan on *T. repens*, in Minnesota on *T. hybridum* and *T. pratense*. *Pseudopeziza trifolii*, leaf spot, was observed in Minnesota on *T. pratense*. *Sclerotinia trifoliorum*, stem rot, was reported from practically every part of Virginia. In severe cases as much as 20 percent of the plants had been killed. (PDR 23:98). Washington. *Stemphylium sarcinaeforme*, leaf spot, caused a trace loss in Wisconsin. Also reported from Michigan and Minnesota.

Uromyces elegans, rust, was reported by P. A. Young on *T. carolinianum* from Texas as an economically serious disease. It was epiphytotic in Cherokee County. K. Starr Chester reported that specimens had been sent in from Russellville, Arkansas; he also reported the disease in Oklahoma on *T. procumbens*. *U. minor*, rust, was reported on *T. parryi* by W. G. Solheim in Albany and Carbon Counties, Wyoming. *U. trifolii*, rust, was reported causing a trace loss in Illinois. Wisconsin reported rust less prevalent than last year owing to the dry weather. *U. trifolii fallens* was reported very severe in some plantings in New Jersey. J. J. Christensen reported the usual prevalence on red clover (*T. pratense*). *U. trifolii hybridi* was observed in Michigan and Minnesota on alsike clover (T. hybridum), and U. trifolii trifolii-repentis in Minnesota on white clover (T. repens).

Blue-green algae, black scum, was observed in the District of Columbia on clover lawn. This condition arose each time the lawn was wet and there was no sun for a period of one day. Blue grass was affected similarly.

Mosaic (virus). New York, Maryland, and Minnesota. Witches' broom (virus) was reported in Washington by the State Department of Plant Pathology.

VICIA spp. VETCH:

Ascochyta pinodella, foot rot. Washington. Uromyces coloradensis, rust, was reported in Carbon County, Wyoming, by W. G. Solheim.

VIGNA SINENSIS. COWPEA:

Cercospora cruenta, leaf spot, was observed in New Jersey, Texas, and Illinois. C. vignae, leaf spot, was also observed in Texas. Choanephora cucurbitarum was reported from Georgia (PDR 23: 293). Colletotrichum lindemuthianum, anthracnose, was reported again this year in Hughes County, Oklahoma. Erysiphe polygoni, powdery mildew, Texas and California.

Fusarium bulbigenum tracheiphilum, wilt. Illinois, "Average prevalence 14.7 of plants infected in 2 fields." The maximum infection in any one field was 26.5 percent of plants. In California, J. B. Kendrick reported less wilt in San Joaquin Valley than usual due to use of resistant varieties (Calva types).

Heterodera marioni, root knot nematode. Oklahoma.

Macrophomina phaseoli, stem rot. In Riverside County, California, John T. Middleton reported the usual prevalence.

Phoma lathyrina, pod canker. Only a trace was found in one planting in Illinois, according to the Natural History Survey.

Phymatotrichum omnivorum, root rot, was reported in Bell County, Texas causing 5 percent loss. Also reported from Smith County. Pythium ultimum, root rot, was reported by John T. Middleton in Riverside County, California, with the statement that this disease was new to southern California.

Rhizoctonia bataticola, charcoal rot, was reported less prevalent in Illinois than last year; also reported from California.

Uromyces phaseoli vignae, rust, was reported by K. Starr Chester in Oklahoma as being severe in individual fields. An estimated damage of 25 percent was reported in one field at Blanchard.

Chlorosis (non-parasitic). Bell County, Texas reported 5 percent loss. Mosaic (virus). Chester reported in Oklahoma that a 60-acre field grown for certification showed 100 percent infection. Mild and severe strains were distinguished.

GRASSES

Grass diseases occurring in the Pullman Nursery Unit of the Soil Conservation Nurseries, Pullman, Washington, during 1939, are listed in the Reporter 24: 108-120, by George W. Fischer.

AGROPYRON spp., WHEATGRASS:

Claviceps sp., ergot, was reported of slight importance in Wyoming on *A. pauciflorum** and *A. smithii* by Starr and Lang. It was found only in Johnson County. *C. purpurea* was reported in Oklahoma on *A. repens* by W. W. Ray, and in Wyoming on *A. spicatum* by W. G. Solheim.

Ustilago hypodytes, smut, was reported by F. D. Heald and L. K. Jones from Whitman County, Washington.

AGROSTIS spp. BENTGRASS:

Fusarium sp., false snow mold, in Minnesota was much more prevalent than for several previous years, according to I. W. Tervet, "Occasional red-brown to brown spots were found on greens treated in fall of 1938 with standard mercury treatment. No true snow mold was found on these greens. Isolates of *Fusarium* sp. did not resemble *F. nivale*. There was normally slight development of *F. nivale*, snow mold, which received fungicidal treatment."

Helminthosporium spp., brown spot, was reported by Tervet from Minnesota, associated with warm humid weather. He also reported *Pythium* sp., damping-off, at a Nursery at University Golf Club partially destroyed but recovered following the period of dry weather. There was very rapid development of the disease in low lying areas.

AGROSTIS ALBA. REDTOP:

Colletotrichum graminicolum was reported by the Illinois Natural History Survey in the following counties: "In Clay County, 84 percent of the plants with 28 percent of the leaves were diseased. In Crawford County, 43 percent of plants with 26 percent of leaves were diseased. In Richland County 3 percent of plants with 10 percent of leaves were

* = *A. trachycaulum*.

diseased." Other diseases reported by the Illinois Natural History Survey are: Marasmius tritici, toadstool, "Average prevalence of 1.5 percent of plants in 2 fields were diseased. First record for this host." Puccinia graminis, rust, "Average prevalence of 3 fields, 51.6 percent of plants and 25.6 percent of leaves diseased." Scolecotrichum graminis, leaf spot, "In Crawford County, 21 percent of plants with 19.6 percent of leaves were diseased. In Richland County 78.3 percent of plants with 56 percent of leaves were diseased." Ustilago striaeformis, stem smut, "Average prevalence in 4 fields examined, 2.8 percent of plants diseased. Only found in 3 of 4 fields."

ANDROPOGON spp., BEARDGRASS:

Puccinia andropogonis, rust, was reported by C. O. Johnston in Kansas as being severe on A. furcatus and A. scoparius in a nursery and field plot sowing at Agronomy Farm and Soil Conservation nursery at Manhattan. Sorosporium ellisii, head smut, was observed in Payne County, Oklahoma, according to W. W. Ray.

AXONOPUS COMPRESSUS, CARPET GRASS:

Cerebella andropogonis, Mississippi and Louisiana (PDR 23:309). Fusarium heterosporium was reported on the same specimen from Mississippi by L. E. Miles.

BOUTELOUA CURTIPENDULA.SIDE-OATS GRAMA:

Puccinia bartholomaei, rust. Oklahoma.

BROMUS spp., BROMEGRASS:

Helminthosporium bromi, leaf spot, was collected only in Ingham County, Michigan. Spots were found on every leaf in one field according to R. W. Lewis. Ustilago sp., smut. Washington. U. bromivora, smut. Oklahoma, in Garfield County.

CALAMAGROSTIS RUBESCENS. PINEGRASS:

Puccinia coronata, rust, was collected on Signal Mt., Jackson Hole, Teton County, Wyoming, July 29, 1939, by W. G. Solheim.

CENCHRUS PAUCIFLORUS. FIELD SANDBUR:

Sorosporium syntherismae, smut. Texas County, Oklahoma.

CYNODON DACTYLON. BERMUDA GRASS:

Physarum cinereum, slime mold. Oklahoma.

Rhizoctonia solani? Corticium sasakii, rhizoctonia, was reported by T. C. Ryker in Louisiana as more prevalent than for several years. "The disease appears following periods of frequent rains during the summer. This occurred this summer during June and July." Rhizoctonia sp., probably solani was reported by J. G. Brown in Arizona as "Common. Over-irrigation frequently brings it on. Throughout the spring, summer and fall it is found on Bermuda grass, in the winter on Australian rye."

Ustilago cynodontis, smut, caused a 3 percent loss in Bell County, Texas, according to C. H. Rogers. K. Starr Chester reported the disease in two counties in Oklahoma.

DACTYLIS GLOMERATA. ORCHARD GRASS.

Erysiphe graminis, powdery mildew. Washington.

DIGITARIA SANGUINALIS. CRABGRASS:

Piricularia grisea, leaf spot. Oklahoma. Ustilago rabenhorstiana, smut, was observed by Frank L. Howard in Washington County, Rhode Island. He said the disease was only slightly prevalent.

ECHINOCHLOA CRUSGALLI. BARNYARD GRASS:

Ustilago crusgalli, smut, was reported on barnyard grass in some irrigated orchards in Washington.

ELYMUS spp., WILD-RYE:

Claviceps sp., ergot. In Wyoming Starr and Lang reported ergot was found only in Johnson County. Puccinia glumarum, stripe rust, was found in Oregon on E. glaucus (PDR 23:221).

HORDEUM JUBATUM. SQUIRRELTAIL BARLEY

Ustilago lorentziana, smut, was reported from Laramie, Wyoming, by W. G. Solheim.

KOELERIA CRISTATA. JUNEGRASS.

Puccinia coronata, rust, was collected on Signal Mt., Jackson Hole, Teton County, Wyoming July 29, 1939 by W. G. Solheim.

LEERSIA HEXANDRA:

Ramularia sp., leaf spot, was reported by T. C. Ryker from University, Louisiana.

PANICUM spp. PANICUM:

Septoria sp., leaf spot, was reported on P. clandestinum in Oklahoma by W. W. Ray. Uromyces graminicola, rust, was reported by C. O. Johnston as "Severe on nursery and field plot sowings of P. virgatum at the Agronomy farm and Soil Conservation nursery at Manhattan, Kansas."

PHLEUM PRATENSE. TIMOTHY:

Heterosporium phlei?, leaf spot. Washington. Macrophoma phlei, leaf spot. Reported by the Illinois Natural History Survey in Macoupin County. Puccinia graminis phlei-pratensis, rust. The Illinois Natural History Survey reported average prevalence (2 fields) 68.9 percent of plants and 3.1 percent of stem area diseased; Washington. Scolecotrichum graminis, leaf spot. Illinois. Ustilago striaeformis, stem smut. Illinois. Leaf spot (non-par.) Washington.

POA spp., BLUEGRASS:

Helminthosporium spp. brown spot. Pennsylvania and Minnesota.

SORGHASTRUM NUTANS. INDIAN GRASS:

Puccinia virgata, rust. Oklahoma.

SORGHUM HALEPENSE. JOHNSON GRASS:

Cercospora sorghi, leaf spot. Texas. Puccinia purpurea, rust. Texas and Oklahoma. Sphacelotheca cruenta, smut, was reported very common in Oklahoma by K. S. Chester. S. sorghi, smut. C. H. Rogers reported 2 percent loss in Bell County, Texas.

SORGHUM VULGARE SUDANENSE. SUDAN GRASS:

Colletotrichum graminicolum, anthracnose. Texas. Helminthosporium turcicum, leaf blight. G. H. Godfrey reported a trace to 50 percent loss in one field in Hidalgo County, Texas. C. E. Scott reported the usual prevalence in Imperial County, California. Phytomonas andropogoni, bacterial leaf stripe, according to G. H. Godfrey caused from a trace to 25 percent loss in Hidalgo County, Texas. Puccinia sorghi, leaf rust, caused from a trace to 25 percent loss in one field in Hidalgo County, Texas, according to G. H. Godfrey.

STENOTAPHRUM SECUNDATUM. ST. AUGUSTINE GRASS:

Helminthosporium sp., foot rot. Texas. Physarum cinereum, slime mold, according to W. N. Ezekiel was local, causing very slight damage in Harris County, Texas. Rhizoctonia sp., brown patch. Texas (PDR 24:65).

TRICHOLAENA REPENS NATAL GRASS:

Cerebella andropogonis was collected at Gotha, Florida by Vera K. Charles. First record of this disease on Natal grass (PDR 23: 130-133).

TRIODIA FLAVA. PURPLETOP:

Puccinia windsoriae, rust. Oklahoma.

UNDETERMINED GRAMINEAE:

Helminthosporium sp. was reported State-wide in Pennsylvania causing a total loss of 3 percent.

Micrococcus sp., algae. Washington.

Physarum spp., slime mold. New Jersey, South Carolina and Washington.

Rhizoctonia sp., brown patch. New Jersey. R. solani, large brown patch, was reported less prevalent than last year in Pennsylvania by C. C. Wernham. Sclerotinia homeocarpa, brown patch. In Massachusetts, W. H. Davis writes, "This spring brought an unusually large amount of brown patch or turf, due to S. homeocarpa Bennett, which causes the dollar spot. The sclerotia (gemmae?) were especially plentiful but fruit bodies were not observed. As Bennet suggests, we believe there is but one strain of the fungus found in this region. The sclerotia are sufficient for reproduction since I have found them viable after storage for 13 years in test tube cultures which have dried." C. C. Wernham reported small brown patch in Pennsylvania.

Typhula sp., snow mold, was reported more prevalent in New York than for several previous years, owing to the abundant late snow, which favored the disease. Snow mold was also reported more prevalent in Pennsylvania than for several previous years.

DISEASES OF VEGETABLE CROPS

Diseases of vegetables on the New York market during the months of January, February and March, April to September, October, November, and December 1939 are reported by C. O. Bratley and James S. Wiant in the Plant Disease Reporter 23: 160-165; 374-377. 1939; 24:154-157. 1940.

Vegetable diseases on the Chicago market in 1939 are reported by G. B. Ramsey in the Plant Disease Reporter 24:405-413. 1940.

Summary of the weather and vegetable disease situation in Massachusetts in 1939 is given by O. C. Boyd in the Plant Disease Reporter 23: 237-238; 343-346. 1939. Reports of vegetable diseases in New York are given in the Plant Disease Reporter 23:170. 1939.

ALLIUM CEPA. ONION:

Aspergillus niger, black mold. In Texas, S. S. Ivanoff reported general infection in Dimmit County and throughout the region. The disease was common in market onions in Oklahoma according to K. S. Chester.

Botrytis sp., neck rot, in Massachusetts was reported causing a trace loss. R. E. Vaughan in Wisconsin reported it less than last year. Neck rot caused by B. allii was much less prevalent in New York than in 1938. Very little was found at harvest, although some was carried over on sets from last year. (A. G. Newhall). In Ohio, according to J. D. Wilson, heavy rains in some sections followed by hot weather favored scald and this was followed by neck rot (B. allii). Total loss was estimated at 5 percent.

Colletotrichum circinans, anthracnose, smudge. New York and Pennsylvania, each reported a trace loss. Wisconsin, less prevalent than in 1938.

Ditylenchus dipsaci, bulb or stem nematode, causing onion bloat, according to A. G. Newhall was more prevalent in New York than last year. It is now found in Orange and Madison Counties -- 50 percent loss in areas affected, but so far known in only 6 fields. Vigorous eradication methods have been employed, using chloropicrin and sulphur. (PDR 23:230, 291, 293).

Erwinia carotovora, bacterial soft rot, caused an estimated loss of 7 percent in Massachusetts; Texas reported a trace; Indiana 2 percent, according to R. W. Samson -- many onion growers complained of soft rot or heart rot.

Fusarium spp., storage rot, pink root and bulb rot. Gilgut and Boyd in Massachusetts estimated 8 percent loss from storage rot. They reported pink root less prevalent than last year and stated that this disease is associated with premature ripening and stunting of plants, both seed and set onions, but it is not known how important it is in causing the early maturity. J. G. Horsfall reported a loss of 20 percent in Connecticut, and remarked "Pink root was probably important in Thaxter's time and it still is." (See also Phoma terrestris). F. vasinfectum zonatum form 1, bulb rot, was reported from Iowa by G. Semeniuk.

Macrosporium sp., mold, was reported from Connecticut by A. D. McDonnell. M. porri, purple spot, in New York, was much less prevalent than usual on the late crop owing to the dry weather (A.G. Newhall).

M. sarcinula parasiticum, black mold, was also less prevalent owing to the lack of rain the last half of the summer which held back the disease.

Peronospora destructor, downy mildew, was less prevalent in Massachusetts than in 1938 owing to the effect of the dry weather during May, June and July (PDR 23:229). In New York, A. G. Newhall reported the disease much less prevalent than last year or for several previous years, "It was too dry almost all summer, but perhaps most important is the fact that since sporulation on backyard plantings of top-set onions was one month later than in the past two years, the disease did not attack the commercial crop until very late; therefore, only 3 fields were found with it. Many diseased top-set plantings have been removed in the past 2 years." (PDR 23:205, 230). In Michigan also, according to Ray Nelson, the disease developed later than in 1938 and was less prevalent, although in some local areas it caused marked reduction in yield. He stated that the seriousness of an outbreak is determined by local weather conditions. The reduction in yield was estimated at 3 percent. In Indiana, R. W. Samson reported that mildew was not specifically noted but was undoubtedly present, although probably not so destructive as in 1938. According to R. E. Vaughan, the disease was not reported in Wisconsin this year. Occurrence was noted in Washington. L. D. Leach, in California, reported almost no downy mildew on onions in the interior valleys, owing to the absence of rains. C. E. Yarwood reported its presence in Santa Clara County.

Phoma terrestris, pink root (See also Fusarium spp.): A. G. Newhall reported losses of 75 percent in a few fields in New York, but some of this may have been due to drought and unfavorable pH of the muck soil. (PDR 23:205.) Texas reported 15 percent loss in Dimmit County and throughout region. In Michigan, according to Ray Nelson, pink root was generally present in all older growing sections. It is probably the most serious onion disease in an average season. G. Semeniuk in Iowa reported a trace loss. J. T. Middleton, in California, reported that at San Jacinto where onions were grown successively for 3 years on the same ground, a loss of 20 percent occurred.

Sclerotium cepivorum, white rot. A recurrence of white rot was reported from Virginia December 14, 1938, by Harold T. Cook (PDR 23:5).

Urocystis cepulae, smut, in Massachusetts caused an estimated loss of 1 percent. (PDR 23:229). In New York it was less prevalent than in 1938. A. G. Newhall said "Lack of rain in spring gave formaldehyde treatment its best chance to succeed. Control was excellent everywhere." (PDR 23:204). J. D. Wilson reported 2 percent loss in Ohio. In Indiana, R. W. Samson stated that the disease was controlled very well with formaldehyde, only a trace loss occurred. Wisconsin. Iowa reported 2 percent loss. Washington, in Stevens County.

Yellow dwarf (virus). Iowa, a trace reduction in yield. California, in Contra Costa County.

Scald (non-par.) in Ohio, according to J. D. Wilson caused a loss of 5 percent. Heavy rains in some sections followed by bright sun and high temperatures caused much scald and this was followed by early ripening. Wind caused much damage in New York (PDR 23: 205).

ALLIUM SATIVUM. GARLIC:

Bulb rots caused by Diplodia sp. and Helminthosporium sp. in Lavaca, Fayette and Brazos Counties and by Sclerotium rolfsii in Brazos and Lavaca Counties were reported by G. E. Altstatt from Texas.

Ditylenchus dipsaci, bulb nematode, was reported from Monterey County, California, by M. R. Harris.

APIUM GRAVEOLENS. CELERY:

Cercospora apii, early blight, in Massachusetts according to O. C. Boyd was much less prevalent than in 1938 (PDR 23:262). The disease was observed to be serious in one field near Windsor, Connecticut. Also observed on young plants brought in from Florida (J. G. Horsfall). In New York, Charles Chupp reported that although the disease was slow in getting started, owing to lack of rains, late in the summer in Wayne County it became troublesome in spite of the dry weather. Actual losses in Wayne County were small. On Staten Island, however, where greatest development and spread took place during August, the disease seemed worse than usual in spite of drought and caused a loss reported at 8 percent. In Nassau County on Long Island the average loss was about 2 percent. New Jersey reported the disease more prevalent than in the last few years. R. S. Kirby reported a total loss of 5 percent in Pennsylvania. In Florida G.R. Townsend stated that early blight was much more prevalent than last year and estimated the reduction in yield at 25 percent. It was generally controlled with copper. In Ohio, J. D. Wilson reported that weather conditions apparently favored the persistence of this disease in epidemic form throughout the season, the estimated reduction in yield being 10 percent. Owing to abundant rains, early blight was more prevalent than last year in Indiana, where the estimated loss in value was 25 percent. In Michigan, according to Ray Nelson the summer crop was practically ruined in August and the loss exceeded $150,000 for the season. Spraying was not very effective in some areas owing to weather conditions. The disease was reported less prevalent in Wisconsin than in 1938. In Minnesota Carl J. Eide reported about the average amount. It was found on nearly all celery in local markets. Spraying was the regular practice. John T. Middleton reported the usual prevalence of early blight in California in Orange and San Diego Counties.

Erwinia carotovora, bacterial soft rot. The New Jersey Plant Pathology Department reported the disease in north Jersey. One entire crop was ruined in Monmouth County.

Fusarium apii and F. apii pallidum, fusarium yellows, in Nassau County, New York was not very widespread --about 1 percent loss for the county (C.S.Cannon). A.G. Newhall reported "Same as usual in western New York on later crops -- varied from 0 to 75 percent in some fields." In Wayne County the disease appeared on many more farms this year (PDR 23:263). Ohio estimated 5 percent loss and Indiana 0.5 percent. In Michigan, Ray Nelson reported scattered distribution with a trace loss -- about the usual amount in commercial varieties. Nearly all plantings now consist of resistant varieties. J. B. Kendrick, in California, reported fusarium yellows generally prevalent in the Terminus district of San Joaquin County where Golden types are grown. All green types were highly resistant. Fusarium sp., yellows, caused a trace loss in Pennsylvania according to R. S. Kirby. Wilt caused by Fusarium sp. was observed in Wisconsin. Known infested areas are largely planted to resistant varieties. This disease was also present in a few muck fields in New Jersey.

Heterodera marioni, root knot nematode, was observed in New York causing injury to greenhouse celery seedlings. In Ohio, John D. Wilson reported "This disease was surprisingly scarce considering the mild winter preceding and the rather dry growing season." The estimated reduction in yield was 1 percent.

Phytomonas jaggeri, bacterial blight. New York, now found only on a few farms mostly in Wayne County, and is usually easily controlled by regular dusting practices (A. G. Newhall). (PDR 23:263).

Rhizoctonia sp., rot, was observed in Bergen County, New Jersey.

Septoria apii and S. apii-graveolentis, late blight, was reported much less prevalent in New York than in 1938. The weather was too dry to permit its spread. Newhall stated that growers were paying more attention to disease-free seed, seed treatment, and seedbed dusting. In Pennsylvania R. S. Kirby reported 7 percent loss. J. D. Wilson in reporting from Ohio said the "Disease was not observed in epidemic form in any field this year probably because of dry warm weather prevailing during most of the growing season." Estimated reduction in yield was 1 percent. In Michigan Ray Nelson reported "Rainfall was deficient in September and October; therefore, late blight was much less destructive than usual. In scattered areas average losses occurred following fall rains." Estimated total loss was 7 percent. Not as prevalent as last year in Wisconsin, according to R. E. Vaughan. Occurrence was noted in Washington, in Pierce County. The disease was reported from California by M. W. Gardner and John T. Middleton. In Massachusetts, much less prevalent than last year owing to the dry season. (PDR 23:262).

Virus diseases: In New York, Newhall stated that all virus troubles were more prevalent than usual. He reported considerable amounts of what was probably aster yellows, although the diagnosis was doubtful. J. B. Kendrick, in California, reported aster yellows much more prevalent and severe than in previous years in the Sacramento and San Joaquin Valleys. Damage up to 25 percent was caused in many fields near Sacramento. In New York, Newhall reported more apids and more cucumber mosaic on celery than usual in Wayne County, with losses of a trace to 50 percent in some fields. There was some loss of early celery (June) in Orange County. In California, J. B. Kendrick reported western celery mosaic severe in market gardens south of Sacramento (up to 100 pecent) in the Sacramento-San Joaquin Valley. J. T. Middleton reported the disease in Los Angeles, Orange and San Diego Counties. The Department of Plant Pathology reported western yellow mosaic in King County, Washington. Spotted wilt was reported in Contra Costa County, California by M. W. Gardner.

Non-parasitic diseases: In New York, Charles Chupp reported black heart less prevalent than last year. The weather was too dry with not enough hot nights to bring it on. The estimated loss was a trace. Cracked stem (boron deficiency) in Massachusetts -- not much damage seen or reported in spite of the dry season. Growers are more careful about overliming in recent years (O.C. Boyd). In Connecticut J. G. Horsfall reported the disease more prevalent than last year, owing to the dry weather during the early season. Newhall in New York reported cracked stem less prevalent than usual in spite of the dry season as borax was successfully used in the worst fields. Salt injury was reported in Massachusetts (PDR 23:262).

ASPARAGUS OFFICINALIS. ASPARAGUS:

Cercospora asparagi, leaf spot. South Carolina, in Barnwell County.

Fusarium spp., stem rot, wilt and root rot. Stem rot in Massachusetts was reported less prevalent than last year or for several previous years, owing to the dry season. The New Jersey State Department of Plant Pathology reported wilt of no great economic importance. In Washington a destructive fusarium root rot occurred in the central irrigated section (Yakima Valley) (Wash. Agr. Exp. Sta. Bull. 384:62. 1939. (Rept. 1938-39)).

Puccinia asparagi, rust, was less prevalent in Massachusetts than for several previous years, owing to the dry season, according to O. C. Boyd, who reported that the Washington varieties apparently are becoming more susceptible. Estimated loss 0.5 percent. Charles Chupp reporting from New York said "Several States have reported renewed outbreaks of rust, therefore, I examined asparagus plantings wherever I could this summer. I visited about 20 counties, but I found no rust upstate." New Jersey reported rust more abundant than usual -- especially severe in a few plantings in the south. R. A. Jehle in Maryland reported the usual prevalence with 2.5 percent loss. Other States reporting were Wisconsin and North Dakota.

Sunscald. Washington, in Benton County.

BEAN. See PHASEOLUS.

BEET, GARDEN. See BETA VULGARIS.

BEET, MANGEL WURZEL. See BETA VULGARIS MACRORHIZA.

BETA VULGARIS. GARDEN BEET.

Actinomyces scabies, scab, was reported more prevalent than last year in New York by Charles Chupp, who estimated a trace loss. Wisconsin also reported the disease more prevalent. New Jersey reported its occurrence in Middlesex County.

Alternaria sp., leaf spot: Washington.

Cercospora beticola, leaf spot: Seven reports from widely scattered farms in Connecticut, but only a trace loss was recorded. New York reported a trace loss. J. D. Wilson in Ohio reported 2 percent reduction in yield. R. W. Lewis reported the disease in Saginaw County, Michigan. Less prevalent than last year in Wisconsin, according to R. E. Vaughan. New Jersey, Texas, Oklahoma, Kansas, Washington, and California reported occurrences.

Peronospora schachtii, downy mildew. Washington and California.

Rhizoctonia and Pythium, damping-off. In Wisconsin, R. E. Vaughan reported the usual prevalence. "Cuprocide was used by many Milwaukee truck gardeners, few sugar beet growers." R. solani, crown rot, was reported by G. H. Starr in Wyoming causing a trace loss.

Sclerotium rolfsii, southern blight: Texas.

Virus diseases: Curly top and mosaic were reported from Texas.

Black spot (boron deficiency) was reported by R. E. Vaughan as being less prevalent than in 1938. This disease has become rapidly an extremely important one in the canning industry.

Blight (heat injury, 110°+ when plants were young): Washington, in Benton County.

Girdle (boron deficiency) caused a trace loss in New York, according to Charles Chupp, who stated that boron is being used more generally.

Crown rot (undetermined): Washington.

BETA VULGARIS CICLA. SWISS CHARD:

Phymatotrichum omnivorum, root rot. Rogers estimated a loss of 4 percent in Bell County, Texas.

Curly top (virus) was observed in Contra Costa County, California, according to M. W. Gardner.

BETA VULGARIS MACRORHIZA. MANGEL-WURZEL:

Cercospora beticola, leaf spot, according to Charles Chupp was rather common this year despite dry hot weather; however, it was much less prevalent than in 1938.

Curly top (virus). Washington, in Okanogan County.

(BRASSICA CAMPESTRIS) RUTABAGA. BRASSICA OLERACEA var. NAPO-BRASSICA:

Erysiphe graminis, powdery mildew. Texas. California, usual prevalence in Orange County, according to John T. Middleton.

Phytomonas campestris, black rot. New Jersey. Wisconsin, scattered distribution.

Verticillium albo-atrum, wilt. In Orange County, California, John T. Middleton reported the usual prevalence.

BRASSICA CHINENSIS. PAKCHOI CABBAGE:

Cercosporella albo-maculans, leaf spot. San Mateo County, California.

BRASSICA OLERACEA var. BROCCOLI:

Alternaria brassicae, leaf spot. In New York a trace loss was reported by Charles Chupp.

Mycosphaerella brassicicola, ring spot, was reported by M. W. Gardner, in San Mateo County, California on a variety known locally as Breschetti.

Phytomonas campestris, black rot. Trace loss in New York reported by Charles Chupp. Harold T. Cook, in Virginia reported the disease localized in portions of fields set with plants raised on one farm in Pennsylvania. There was practically none on other plants in the field. Wisconsin.

Plasmodiophora brassicae, club root. In Nassau County, O. S. Cannon reported a trace.

Black ring (virus) in California was reported by C. E. Scott in Santa Clara County, and by M. W. Gardner on B. oleracea italica in Contra Costa and San Mateo Counties.

Albinism. Southwest Texas (PDR 24:42).

BRASSICA OLERACEA BOTYTIS. CAULIFLOWER:

Alternaria brassicae, leaf spot, caused a trace reduction in Connecticut, according to J. G. Horsfall. In Massachusetts, C. C. Boyd reported the disease much less prevalent than in 1938 owing to the dry year. A. herculea, gray leaf spot, was reported with A. brassicae from New York by Charles Chupp as being much less prevalent than last year or for several previous years. Apparently the weather was too dry and hot.

Corticium solani, wirestem, was observed in seed beds in New York.

Erwinia carotovora, soft rot. In New York, Charles Chupp reported slightly more than last year because there was more insect injury. Estimated loss 0.25 percent. In Nassau County, O. S. Cannon reported one-third of plants in 2 fields had heads rotted in the button stage.

Fusarium conglutinans, yellows: This disease was only reported from Wisconsin, where cauliflower is said to be a very minor crop.

Mycosphaerella brassicicola, ring spot: California, in San Mateo County (M.W. Gardner).

Peronospora parasitica, downy mildew, was reported by Charles Chupp as much less prevalent in New York than last year or for several previous years, as it was too dry and hot for the mildew to develop. M. R. Harris reported it in Santa Barbara County, California.

Phytomonas campestris, black rot, in Massachusetts was reported by C. C. Boyd as causing 2 percent loss -- less prevalent than for several previous years. Charles Chupp reporting from New York said, "Again it began to appear in September and did rather serious damage in a number of late fields. The source of inoculum has not yet been determined. Wintercress, Barbarea vulgaris, has a similar disease, but the two organisms do not cross on opposite hosts." C. E. Tims in Louisiana reported black rot very destructive in one planting of several acres in West Feliciana Parish, Louisiana.

Phytomonas maculicola, peppery leaspot, was reported much less prevalent in Massachusetts owing to the dry season. In New York it "could not be found this season, although isolations were made from material with symptoms resembling the disease."

Plasmodiophora brassicae, club root, was reported from New Hampshire by S. Dunn. It was less prevalent in Massachusetts than in an average year, owing to the generally dry season. Estimated loss was 1 percent. New York, scattered distribution, estimated loss a trace. In Ohio, J. D. Wilson reported 2 percent loss. Washington, in Piere County.

Sclerotinia sclerotiorum, watery soft rot, was reported in New York by Charles Chupp, "Not so prevalent on cauliflower as on cabbage -- possibly because of more open growth." Estimated loss a trace.

Black ring (virus) was reported in Contra Costa and San Mateo Counties, California by M. W. Gardner.

Mosaic (virus). Reported from California by M. W. Gardner and John T. Middleton.

Malnutrition, due to magnesium deficiency, according to Charles Chupp in New York, has in recent years been confused with injury due to acid soil. Most commercial growers are now using magnesium lime. A trace loss was estimated. Malnutrition, due to low pH of soil, caused a total loss of 5 to 7 percent in New York. There seemed more than usual. Owing to lack of rains, lime that had been applied did not become available. A few fields were seen where the entire crop was lost (Charles Chupp).

Tipburn (potash deficiency) in New York was reported less prevalent than for several previous years. In dry hot seasons, this tipburn is less severe. (Charles Chupp).

BRASSICA OLERACEA CAPITATA. CABBAGE.

Alternaria brassicae, leaf spot, was reported less prevalent in Massachusetts, owing to the dry season. A. herculea, gray leaf spot, was reported with A. brassicae in New York. There was more than usual, since it followed injury by drouth, aphids, heat etc. Total estimated loss a trace. In Pennsylvania, R. S. Kirby reported a loss of 0.1 percent from alternaria leaf spot. Wisconsin, scattered distribution.

Corticium solani, wire stem, stem rot. In New York Charles Chupp estimated a trace loss and stated that there is always an appreciable loss from setting out plants with wire stem. New Jersey. In Pennsylvania R. S. Kirby reported 5 percent reduction in yield. The disease was found in some hotbeds in Kansas, according to O. H. Elmer. In California, John T. Middleton reported that stem rot usually attacks the transplants, particularly in low spots in the field.

Erwinia carotovora, bacterial soft rot, followed worm and aphid injury in New York. Less prevalent than in 1938 -- estimated loss a trace. In Indiana, R. W. Samson reported the disease bad on late harvested and stored cabbage. Estimated total loss was 12 percent. O. H. Elmer in Kansas reported soft rot less prevalent than in 1938.

Erysiphe polygoni, powdery mildew, was reported in Contra Costa County, California by M. W. Gardner.

Fusarium conglutinans, wilt or yellows, in New York, as reported by Charles Chupp is more widespread than ever before. Much seed of resistant varieties is now being used. In Nassau County, O. S. Cannon reported 5 percent loss for the entire county. Other counties reporting were Niagara, Orleans, Monroe, Wayne, Ontario, Richmond, and Nassau. New Jersey reported less than usual throughout the State. In Pennsylvania R. S. Kirby estimated 8 percent reduction in yield. R. A. Jehle reported yellows in Maryland less prevalent than last year, a 4 percent reduction in yield was estimated. In West Virginia, J. G. Leach reported a total loss of 5 percent. J. D. Wilson in Ohio reported that the use of resistant strains was gradually reducing losses from this disease. In Indiana, R. W. Samson reported yellows more abundant than usual on early cabbage. Estimated loss 5 percent. In Michigan, Ray Nelson remarked "More reports than in any previous season. In the average season, soil temperature is unfavorable. The disease is more widely distributed than previous reports have indicated. Estimated reduction in yield 2 percent." R. E. Vaughan, in Wisconsin, reported the total amount of yellows declining on account of the general use of resistant varieties in areas known to be infested. The disease was observed in Minnesota, Iowa, North Dakota and Kansas. E. O. Miller reported 50 percent loss in one large field in Johnson County, Kansas. The disease was also noticed in Reno and southeast Kansas.

Mycosphaerella brassicicola, leaf spot. Washington, "leaf spot and blight was especially serious on the cabbage grown for seed in the coast areas." (Wash. Bull. 384:62. 1939. Rept. 1938-39). In California, M. W. Gardner reported that the dry fall checked the spread of the disease.

Peronospora parastica, downy mildew, in Massachusetts and New York was less prevalent than for several previous years according to Boyd and Chupp. New Jersey. R. S. Kirby reported a trace loss in Pennsylvania. Texas, in Dimmit and Hidalgo Counties. In California, John T. Middleton reported downy mildew more prevalent than for several previous years.

Phoma lingam, blackleg, in Massachusetts was much less prevalent than last year according to O. C. Boyd. A trace loss was reported by J. G. Horsfall in Connecticut. Charles Chupp reported a trace loss in up-state New York and 0.5 percent on Long Island. In Nassau County:

"One five-acre field was plowed up because of it. It was imported on southern-grown plants." O. S. Cannon. New Jersey, generally distributed. (PDR 23:170). In West Virginia J. G. Leach estimated 1 percent loss. R. A. Jehle in Maryland reported blackleg more prevalent than last year or for several previous years -- estimated total loss was 2 percent. R. E. Vaughan reported scattered distribution in Wisconsin.

Phytomonas campestris, black rot, in Massachusetts was reported less prevalent than last year or in an average year owing to the unusually dry season. Boyd estimated a total loss of 2 percent. New York reported a total loss of 2 to 3 percent. "It still comes late in the season. The source of the inoculum has not yet been found." New Jersey. In Pennsylvania R. S. Kirby reported a total loss of 1.5 percent -- less prevalent than for several previous years. R. A. Jehle in Maryland reported 1.5 percent reduction in yield. J. G. Leach in West Virginia estimated a total loss of 1 percent. A loss of 25 percent was reported by G. H. Godfrey in Hidalgo and Cameron Counties, Texas. In Ohio, J. D. Wilson reported an estimated reduction in yield of 2 percent. According to R. W. Samson the disease in Indiana was much less prevalent than last year owing to the fact that the dry weather checked the spread of the disease on the late crop. "Considerable late cabbage is grown on muck soil in northern Indiana. No rains fell after August 19 until after frost." Michigan; Wisconsin, distribution was scattered in the eastern, southeastern, and western parts of the State. It was quite bad in the Shiocton area. (R. E. Vaughan). I. E. Melhus reported only a trace loss in Iowa, much less prevalent than for several previous years.

Phytomonas maculicola, leaf spot, was reported by J. T. Middleton from California affecting young leaves.

Plasmodiophora brassicae, club root, was observed in New Hampshire. Boyd reported 1 percent loss in Massachusetts -- much less prevalent than in 1938. (PDR 23:343). One report from Connecticut. Charles Chupp in New York reported 1 to 3 percent total loss. The New Jersey State Department of Plant Pathology reported the disease generally distributed. One field in Cumberland County showed 15 percent infection. Pennsylvania and Maryland each reported 0.5 percent loss. A trace loss in West Virginia according to J. G. Leach. In Wisconsin R. E. Vaughan reported club root less prevalent than in 1938 owing to the dry weather. In Minnesota C. J. Eide reported "Always present -- probably the same as usual." In Indiana R. W. Samson reported a trace loss. "Noted in abundance in cabbage planting at Walkerton in soil contaminated by mint plants taken from muck soil infested with club root." Michigan. Washington, in Pierce and King Counties.

Sclerotinia sclerotiorum, drop, was reported in New York mostly on cabbage which was not harvested early enough for proper stage of maturity.

Virus diseases: Mosaic was reported in Wisconsin and California; ring spot in Washington and black ring in California.

Tipburn (non parasitic--potash deficiency). Much less than usual in New York because of dry weather.

BRASSICA OLERACEA GEMMIFERA. BRUSSELS SPROUTS:

Erwinia carotovora, soft rot. Washington in Pierce and Grays Harbor Counties.

Mycosphaerella brassicicola, ring spot, was reported in San Mateo County, California by M. W. Gardner.

BRASSICA OLERACEA var. NAPO-BRASSICA. See under Brassica campestris.

BRASSICA PEKINENSIS. PETSAI CABBAGE:

Cercosporella albo-maculans, leaf spot, was observed in San Mateo County, California by M. W. Gardner.

BRASSICA RAPA. TURNIP:

Alternaria brassicae, leaf spot, was observed in Massachusetts, but was much less prevalent than in 1938.

Cercosporella albo-maculans, leaf spot, in Massachusetts caused an estimated loss of 2 percent, which was less than usual.

Erysiphe graminis, powdery mildew, was reported in Los Angeles and Riverside Counties, California by John T. Middleton.

Heterodera marioni, root knot nematode, Oklahoma.

Phoma lingam, blackleg, was reported much less prevalent in Massachusetts, owing to the dry season.

Phytomonas campestris, black rot. In Massachusetts, O. C. Boyd estimated 1 percent loss. Much less prevalent than in 1938 owing to the dry season. J. G. Horsfall estimated a trace reduction in yield in Connecticut.

Plasmodiophora brassicae, club root, was much less prevalent than in 1938 in Massachusetts, according to O. C. Boyd.

Dark center (boron deficiency) was more prevalent in Massachusetts than for several previous years owing to the dry season. Estimated loss was 7 percent according to O. C. Boyd, who stated that many growers prevent losses by applying borax to the soil.

Leaf necrosis (undetermined). Washington.

Mosaic (virus). California.

BROCCOLI. See BRASSICA OLERACEA var.

BRUSSELS SPROUTS. See BRASSICA OLERACEA GEMMIFERA.

CABBAGE. See BRASSICA OLERACEA CAPITATA.

CANTALOUPE. See CUCUMIS MELO.

CAPSICUM ANNUUM. PEPPER:

Alternaria sp., black spot, in New York, according to Charles Chupp caused a total loss of 2 to 5 percent. "Following malnutrition, sunscald, and other injuries the disease was rather common." The disease caused much damage in southeast Kansas, according to O. H. Elmer and J. O. Miller. Michigan reported a trace loss. A. solani, early blight, according to K. S. Chester, was common in Oklahoma. A trace loss was reported in Texas.

Cercospora capsici, leaf spot, in Louisiana, caused a loss of 1 to 2 percent according to L. H. Person.

Cladosporium herbarum, black mold. In greenhouse in Texas. (P. A. Young).

Colletotrichum sp., fruit rot. Charles Chupp reported that owing to high temperatures, slight amounts occurred in up-state New York where it is rarely present.

Fusarium sp.? wilt (root rot)? Reported in Louisiana by L.H. Person, causing a total loss of 5 percent.

Glomerella cingulata, anthracnose, in Massachusetts was much less prevalent than in 1938 owing to the dry weather -- estimated loss 0.5 percent. G. piperata was reported in Louisiana and Texas. Colletotrichum nigrum was also reported in Louisiana.

Phytomonas vesicatoria, bacterial spot, was reported by Boyd as being much less prevalent in Massachusetts than last year owing to the dry weather from June to August. Spotting was mostly on the foliage -- very little on the fruit. Connecticut, occurred on varietal plots at Storrs (PDR 24:34-36). In New York no trace of it could be found up State. Present on Long Island. Other States reporting were Texas, Michigan, and Wisconsin.

Phytophthora capsici, root rot, was found wherever peppers are grown in Orange County, California, according to J. T. Middleton, who reported the disease from San Diego County also. Damping-off (Pythium and Rhizoctonia spp.) caused 2 percent loss in Massachusetts. Pythium (de Baryanum type) fruit rot was reported from Louisiana by A. G. Plakidas, who remarked "As far as our files show, the disease has not been noted in Louisiana before." This is the first report to the Survey from Louisiana on this host. Estimated reduction in yield was set at 2 percent.

Sclerotium rolfsii, southern blight. Louisiana and Texas.

Verticillium albo-atrum, wilt, in California was reported by J. T. Middleton as common in Orange County, west of Santa Ana, south. Peppers commonly grown in this region.

Albinism (Probably genetic) Texas (PDR 24:41-43).

Blossom-end rot (non-parasitic) was more prevalent in Massachusetts than last year, owing to the dry season -- estimated loss was 7 percent (C. C. Boyd). Connecticut and Texas also reported the disease.

Curly top (virus). Texas (PDR 24:41-43). Pacific northwest. (PDR 24:133). Mosaic (virus). O. C. Boyd reported a loss of 5 percent in Massachusetts. Connecticut reported a trace loss. In New York Charles Chupp reported a total loss of 3 to 7 percent from tobacco mosaic. In up State it was far more common than usual -- apparently due to hot dry weather. M. B. Linn reported the losses small in Staten Island. C. A. Ludwig reported cucumber mosaic on sweet pepper in Washington, D. C. Texas, 5 percent loss in Dimmit County. Loss was slight in Cameron County. Tobacco mosaic was reported in Oklahoma by K. Starr Chester. O. H. Elmer reported its occurrence in Kansas. In Iowa, I. E. Melhus reported "In pepper fields adjacent to tomato fields losses were about 50 percent, on Muscatine Island."

Spotted wilt (virus) was reported from California in Contra Costa, Los Angeles, Riverside and San Diego Counties by Middleton and Gardner.

CICHORIUM ENDIVIA. ENDIVE AND ESCAROLE:

Corticium solani, bottom rot. In New York, C. S. Cannon reported 1 percent loss in Nassau County. M. B. Linn reported 2 percent loss in Staten Island. On the whole, the disease was less prevalent than in 1938.

Yellows(virus) was reported more prevalent than for several previous years in New York. Heavy infestations of leaf hopper vectors favored the disease. In Nassau County, C. S. Cannon reported 5 percent loss -- most serious from July 1 to August 15. M. B. Linn reported 4 percent loss on Staten Island. "The distance from bed to weed reservoirs of vector and virus determines the amount of disease."

CITRULLUS VULGARIS. WATERMELON:

M. N. Walker in a report on watermelon diseases in Florida in 1939 (PDR 23:279-280), states that the 1939 watermelon season was a disastrous one throughout the State, growers sustained losses ranging from 20 to 100 percent, with a State average close to 50 percent. The loss generally was successively worse as the season progressed from central to northern Florida.

Alternaria cucumerina, leaf spot. Florida. In Indiana, R. W. Samson reported 5 percent loss -- more prevalent than for several previous years. Michigan, in Oakland County.

Cercospora citrullina, leaf spot. Florida.

Colletotrichum lagenarium, anthracnose. In New York Charles Chupp reported that watermelons were being more commonly grown in the State, and anthracnose was much less prevalent on watermelons than on muskmelons and cucumbers. The disease in New Jersey was generally distributed according to the State Department of Plant Pathology. R. A. Jehle reported the disease less prevalent in Maryland, estimated total loss was 2 percent. South Carolina (PDR 23:309). Florida. In West Virginia J. G. Leach reported a trace loss. Texas. R. W. Samson reported the disease more prevalent than for several previous years in Indiana, 1 percent loss was estimated from lowered quality. Hawksburg and Klondike R7 were the most resistant varieties. Other States reporting the disease more prevalent were Minnesota, with a loss of 5 percent, Iowa with a loss of 20 percent, and Kansas with severe losses in Kaw Valley. I. E. Melhus noted 100 percent infection in many fields in Iowa. Michigan.

Erwinia tracheiphila, bacterial wilt, was reported more prevalent than usual in Maryland by Jehle, who estimated a loss of 3 percent. Washington.

Fusarium bulbigenum niveum, wilt, which usually occurs in about the same abundance each year, was reported no worse than usual this year. The highest estimated losses were: West Virginia, 20 percent; Iowa, 15 percent; Virginia, 5 percent; and Florida 3 percent. Other States recording the disease were New Jersey, Oklahoma, Texas, Indiana, Michigan, Minnesota, and Kansas.

Heterodera marioni, root knot nematode, in Oklahoma was reported severe on samples submitted by K. S. Chester.

Mycosphaerella citrullina, gummy stem blight, in Florida was reported by M. N. Walker as less prevalent than in 1938. He stated that this disease is generally present, but only occasionally causes losses.

Pseudoperonospora cubensis, downy mildew, in eastern Virginia was reported as prevalent as last year, estimated reduction in yield being 2 percent. Harold T. Cook remarked that this disease "Rivals anthracnose in importance and is probably mistakenly identified for the latter in many cases." South Carolina (PDR 23:309). According to M. N. Walker, in Florida, downy mildew was State wide; the infection was generally heavier than had occurred during the past 10 years. Defoliation markedly reduced the quality. Total estimated loss was set at 15 percent. Texas. In Indiana R. W. Samson reported a loss of 3 percent in quality.

Pythium seedling loss in Iowa was less than last year, according to I. E. Melhus, who estimated a total loss of 3 percent. P. acanthicum, blossom end rot, caused 2 percent reduction in yield in the same State.

Mosaic (virus). Iowa.

COLOCASIA ESCULENTA. DASHEEN:

Pythium debaryanum, root rot, was reported in Orange County, California by M. R. Harris.

CUCUMIS MELO. CANTALOUPE:

Alternaria cucumerina, leaf blight, according to O. C. Boyd was much less prevalent in Massachusetts than last year owing to the dry season, estimated total loss was 2 percent. Connecticut. Charles Chupp in New York reported leaf blight less prevalent than in 1938 owing to the dry hot weather, which seemed unfavorable for the disease. "The only fields affected were shielded from windbreaks or high winds." Estimated total loss was 2 to 3 percent. The disease in New Jersey was general, but most severe in south Jersey. In Maryland R. A. Jehle said it was much more prevalent than last year -- 25 percent loss was reported from Wicomico County by the County Agent. Estimated total loss for State was set at 4 percent. R. W. Samson, in Indiana reported the disease more prevalent than last year owing to abundant rains -- estimated loss in quality was 25 percent. It was also reported more prevalent in Michigan, estimated total loss was 2.5 percent. According to J. H. Muncie it was found in all fields visited. Late pickings of melons were worthless. Wisconsin. Much more prevalent in Iowa according to I. E. Melhus, who estimated a loss of 10 percent.

Cladosporium cucumerinum, scab. In New York, Charles Chupp reported that the hot dry weather was unfavorable for scab development, except very late in September.

Colletotrichum lagenarium, anthracnose, was much less prevalent in Massachusetts this year, owing to the dry weather in July, August, and September. In New York, Charles Chupp reported "Because of high temperatures this disease was more destructive than ever recorded for the State. Many fields were killed soon after picking began. Some farmers thought it was frost." Estimated total loss 5 to 10 percent. Maryland reported 1.5 percent loss, which was less than in 1938. J. G. Leach reported a trace loss in West Virginia. Texas. In Ohio, J. D. Wilson estimated a total loss of 10 percent. In Indiana it was noted by C. T. Gregory as causing considerable damage. Estimated loss in quality was 1 percent. R. E. Vaughan in Wisconsin reported anthracnose less prevalent owing to the dry season. In Minnesota, according to Carl J. Eide, it was "Abundant around Twin Cities where a lot of muskmelons are grown, and reported from Chatfield and other places." Estimated reduction in yield was 10 percent, which is much more than last year. In Iowa, I. E. Melhus reported 100 percent infection in a few fields. Total loss for the State was estimated at 5 percent, which is more than last year. Kansas also reported it more prevalent than last year.

Erwinia tracheiphila, bacterial wilt, in Massachusetts caused a loss of 10 percent again this year, according to O. C. Boyd. In New York, Charles Chupp reported that the hot dry weather favored bacterial wilt. "Growers generally plant more seed than required, so that if 10 to 25 percent of the plants are killed by wilt, there still is a sufficient stand for a good crop." R. A. Jehle estimated 8 percent loss in Maryland. West Virginia and Indiana, each reported 5 percent loss; Iowa, 4 percent. C. J. Eide reported the disease always present to some extent in Minnesota. O. H. Elmer reported that only a trace was noted in Kansas. Washington.

Erysiphe cichoracearum, powdery mildew. In New York, Charles Chupp reported "the dry hot weather seemed to favor mildew -- worst infection known in years. Some fields were entirely killed by time of first picking." In Texas 15 percent loss occurred in Dimmit County. California.

Fusarium sp., wilt. In New York, Charles Chupp estimated "100 percent loss on some farms. Hot dry weather favored the disease. Many crosses have been made between the well-known varieties and immune ones. Some of these strains were tried in half-acre lots on infested farms. Immunity and quality have been obtained, but size and yield are lacking. A large number of back crosses are now being grown." A trace loss was estimated. John T. Middleton reported the disease in Los Angeles and Riverside Counties, California. F. bulbigenum niveum f. 2, wilt, was found in most fields visited in Berrien County, Michigan, according to J. H. Muncie. A trace loss was estimated. In Minnesota the disease is said to be spreading a little each year. One report was received from Chatfield.

Heterodera marioni, root knot nematode. Oklahoma.

Pseudoperonospora cubensis, downy mildew. Massachusetts. James G. Horsfall reported 10 percent loss in Connecticut. "Less serious than on cucumber. 1939 is an epiphytotic year." According to R. A. Jehle there was a 2 percent reduction in yield in Maryland. Not so abundant as usual in New Jersey, according to the State Department of Plant Pathology. In Texas, S. S. Ivanoff reported 20 percent loss in Dimmit County. The disease was noticed particularly in Vigo County, Indiana, according to R. W. Samson, who estimated 1 percent loss. Wisconsin, less prevalent, owing to the dry weather.

Curly top (virus). Pacific Northwest (PDR 24:133).

Mosaic (virus) was much more prevalent in New York than last year or for several previous years. According to Charles Chupp, "The dry hot summer permitted widespread distribution of vectors. Some fields had almost no marketable fruit. Nearly every field in the State was affected. Usually a 100-foot zone clear of weed hosts is sufficient, but this year insect vectors seemed to migrate much farther." Estimated total loss for the State was 7 to 10 percent. In Maryland 2.5 percent loss was reported by R. A. Jehle. Mosaic was also observed in Texas, Wisconsin, Kansas and Iowa. In Minnesota a little was observed in experimental plots.

CUCUMIS MELO INODORUS. HONEY DEW AND CASABA MELONS:

Fusarium wilt was reported by John T. Middleton in California, on honeydew, in Los Angeles and Riverside Counties, and on casaba in Riverside County.

Macrophomina phaseoli, charcoal rot, was isolated from fruits, stems and roots of honey dews in California, according to John T. Middleton.

CUCUMIS MELO RETICULATUS. PERSIAN MELON:

Macrophomina phaseoli, charcoal rot, caused 45 percent loss of fruit in Riverside County, California, according to the report of John T. Middleton. The fungus was isolated from the fruit, root, and stem.

CUCUMIS SATIVUS. CUCUMBER:

Alternaria cucumerina, leaf blight, caused a trace loss in Connecticut. In New York, Charles Chupp reported the disease less prevalent than last year, owing to the fact that it was too dry and hot in most parts of the State. Some fields protected by windbreaks were completely killed by the disease. In Maryland, R. A. Jehle reported 3 percent reduction in yield, which is more than was reported in 1938. J. H. Muncie reported the disease present in all fields visited in Michigan. In Wisconsin it was reported less prevalent than last year owing to the dry season.

Colletotrichum lagenarium, anthracnose, caused a loss of 1 percent in Massachusetts, which is much less than in 1938. Charles Chupp reported 7 to 10 percent loss in New York. "Because of high temperatures this disease was far more severe than for the last 25 years. I saw many fields from Hudson Valley to western part of State completely killed by the time one or two pickings were made. Some growers thought it was frost. Dusting plants did not hold the disease in check. Sprays alone seemed to be effective." R. A. Jehle in Maryland reported 1.5 percent reduction in yield plus 1.5 percent loss in quality. In Ohio, J. D. Wilson estimated 5 percent loss. Anthracnose in Wisconsin was reported less prevalent this year owing to the dry weather. I. E. Melhus reported 10 percent reduction in yield in Iowa.

Erwinia tracheiphila, bacterial wilt, was reported causing an estimated loss of 20 percent in Massachusetts. Charles Chupp reported 1 to 2 percent loss in New York. "Although the percentage of wilt was high owing to the numerous insect carriers, the loss in yield was not great because an excess of seed is planted and wilt helps to thin the stand." In New Jersey wilt was not so abundant as usual; however, it was severe in some fields in south Jersey. R. A. Jehle reported 3 percent reduction in yield in Maryland. A total loss of 2 percent in West Virginia was reported by J. G. Leach. In Ohio J. D. Wilson reported 5 percent loss. In Indiana, R. W. Samson reported severe losses -- 30 percent in one canning company acreage of 125 acres. Estimated loss in quality for the State was 20 percent. J. H. Muncie reported the disease found in all fields visited in Michigan -- estimated loss 1 percent. Wisconsin. Iowa, less prevalent than in 1938. Estimated total loss was 10 percent. California, in San Diego County.

Erysiphe cichoracearum, powdery mildew, in New York was very general, but not so destructive on cucumbers as on melons and squash, according to Charles Chupp. The hot dry weather seemed to favor the disease. Estimated total loss was 0.5 to 2 percent loss.

Heterodera marioni, root knot nematode, Washington, in Walla Walla County.

Phytomonas lachrymans, angular leaf spot, caused a trace loss in New York. Charles Chupp said "apparently owing to weather conditions and the fact that nearly all growers treat the seed with $HgCl_2$, this trouble is almost disappearing from the State." In Pennsylvania R. S. Kirby reported a reduction in yield of 6 percent. The disease was severe in the southeastern part of the State. In West Virginia a total loss of 10 percent was reported by J. G. Leach. J. H. Muncie reported the disease found in all fields visited in Michigan. Wisconsin, scattered distribution.

Pseudoperonospora cubensis, downy mildew, was reported less prevalent than last year in Massachusetts by O. C. Boyd, who estimated a total loss of 3 percent. According to J. G. Horsfall, cucumbers were a "complete loss in some fields in Connecticut. This disease was described early in Connecticut and a fairly complete record of its occurrence exists. It seems to rise and fall. 1938 and 1939 were certainly epiphytotic years." In New York, "none reported -- too dry and hot." R. A. Jehle reported a loss of 2 percent in Maryland. The disease was generally distributed in Virginia, causing a reduction in yield of 8 percent according to Harold T. Cook. Wisconsin, less prevalent than in 1938. Georgia (PDR 23:231,323). A. G. Plakidas reported 12 percent reduction in yield in Louisiana. "The spring crop escaped infection. For the fall crop, 10 to 15 sprayings were necessary to keep the disease in check." The disease was reported in Los Angeles County, California by M. R. Harris.

Pythium sp., Iowa, 5 percent reduction in yield.

Sclerotinia sclerotiorum, timber rot, in New York, caused a trace loss again this year in greenhouses but was rare, according to Charles Chupp. Washington, in Walla Walla County.

Curly top (virus) Pacific northwest (PDR 24:133).

Mosaic (virus). In New York, Charles Chupp reported that 1939 was "one of the most serious years for infection ever experienced in the State. Very few fields did not show some affected plants. Many fields showed 100 percent infection." The New Jersey State Department of Plant Pathology reported mosaic severe on cucumbers grown under glass. Maryland reported a total loss of 3 percent, which was less than in 1938. J. D. Wilson reported a total loss of 15 percent in Ohio and remarked, "This disease is becoming increasingly prevalent in Ohio and is making production of pickles a hazardous undertaking." In Michigan, J. H. Muncie reported good control by weed host eradication, but present in all fields visited. Mosaic was also observed in Wisconsin, Kansas, North Dakota, and Washington.

CUCURBITA spp., SQUASH:

Alternaria cucumerina, leaf spot. According to James G. Horsfall in Connecticut, "This disease was widespread but not particularly destructive. Apparently confused with early stages of downy mildew."

Cladosporium cucumerinum, scab. Washington.

Colletotrichum lagenarium, anthracnose, in New York caused a trace loss. According to Charles Chupp, "It was noticed that where other cucurbits were killed by anthracnose in the vicinity of summer and especially winter squash, the squashes were not much affected."

Erwinia carotovora, bacterial wilt, caused an estimated loss of 25 percent in Massachusetts, according to O. C. Boyd, who stated that the temperature was above normal during July and August, which favored insect activity. In New York Charles Chupp reported 3 to 7 percent loss. There was almost an epidemic. The hot dry weather permitted more general feeding of the insect carriers. (PDR 23:231).

Erysiphe cichoracearum, powdery mildew, in New York was reported statewide by Charles Chupp, causing a total loss of 3 to 5 percent. "Very serious this year, some plantings were killed entirely before the fruit was formed." Washington and California also reported the disease.

Phytomonas cucurbitae, bacterial blight. Possibly because of the unusually dry, hot weather, none was observed this season in New York. (Charles Chupp).

Pseudoperonospora cubensis, leaf spot. Texas.

Rhizopus sp., blossom rot. Washington.

Sclerotinia sclerotiorum, blossom end rot, was found causing only a trace loss on summer squash in New York.

Septoria cucurbitacearum, leaf spot, was much less prevalent than last year in Massachusetts. Boyd said that leaf spot was usually present every year on most varieties but never very damaging on any.

Curly top (virus). Pacific northwest (PDR 24:133).

Mosaic (virus). Trace loss reported in Connecticut. Much more prevalent than last year or for several previous years in New York. In fact it was very serious this year, especially on summer squash, according to Charles Chupp. Estimated total loss 2 to 5 percent. Texas (PDR 24:41-43). Mosaic caused by coastal cucurbit virus (not Keyes) was reported from California by M. W. Gardner. John T. Middleton reported "70 percent infection. Freitag refers to this as the 'extreme venation virus.'"

Root rot. New York (PDR 23:219).

CUCURBITA MAXIMA. WINTER SQUASH:

Erwinia tracheiphila, storage decay. Massachusetts, 2 percent loss.

Erysiphe cichoracearum, powdery mildew. Trace loss in the southern part of Texas.

Fusarium spp., storage decay. Total loss 5 percent in Massachusetts, much less than in 1938.

Mycosphaerella citrullina, black rot (storage decay), in Massachusetts, caused a loss of 10 percent, according to O. C. Boyd. "The leaf and runner infection stages were much less conspicuous generally than in most years." A trace loss was estimated.

Phytomonas cucurbitae, bacterial spot, was much less prevalent in Massachusetts, causing a trace loss.

Sclerotinia sclerotiorum, storage decay, caused 0.5 percent loss in Massachusetts, which is much less than was reported in 1938.

Mosaic (virus) was reported from 7 counties in southern Texas, showing losses from 10 to 100 percent.

CUCURBITA PEPO. ZUCCHINI SQUASH:

Fusarium sp., wilt, was observed in San Benito County, California (C.E. Scott).

CUCURBITA PEPO CONDENSA. SUMMER SQUASH:

Alternaria sp., fruit rot. In New York Charles Chupp reported one field of summer squash badly affected.

Cladosporium cucumerinum, scab, was reported much less prevalent than last year in Massachusetts -- estimated total loss was 3 percent.

Fusarium sp., foot rot, is a new disease in Connecticut according to J. G. Horsfall, who said, "At first it seemed to occur only on Early Prolific, but this was found to be due to infected seed, not varietal susceptibility." Estimated reduction in yield for Early Prolific was 15 percent.

F. javanicum, fusarium stem rot, was reported from New York for the first time to the Survey by Charles Chupp. W. E. Snyder's identification was verified by Wollenweber. There was "Nearly 100 percent loss of the yellow straight-neck summer variety known as Prolific. The seed put out by a mid-western seed company seemed 100 percent infected. Reports were received from many counties and several States."

Mosaic (virus) in Massachusetts was most prevalent in summer squash started under glass -- estimated loss 3 percent.

CYNARA SCOLYMUS. GLOBE ARTICHOKE:

Heterodera marioni, root knot nematode, was observed in San Luis Obispo County, California, according to C. E. Scott.

Ramularia cynarae, leaf spot. California. First report of fungus in the United States (PDR 23:199).

DAUCUS CAROTA. CARROT:

Alternaria carotae, leaf blight, was much less prevalent in Massachusetts owing to the dry season -- estimated loss 1 percent (O.C.Boyd). Connecticut. Charles Chupp in New York reported a trace loss -- the weather was too dry and hot in most areas of the State. In New Jersey, it was not of great economic importance. R. S. Kirby in Pennsylvania reported 1 percent loss. In Texas, S. S. Ivanoff reported 5 to 10 percent loss in Dimmit County. J. D. Wilson reported, "This disease is becoming increasingly common in Ohio fields. Spray program is indicated as necessary for crop production." Usual prevalence in Indiana. Michigan. J. T. Middleton reported blight in four counties in southern California. A. radicina, black rot, New York, trace loss.

Cercospora apii carotae, leaf spot, was much less prevalent this year in Massachusetts owing to the dry weather during July and August. The worst damage was on the late crop, estimated total loss 1 percent (O.C.Boyd). Trace loss in New York. J. D. Wilson reported "This disease is becoming increasingly common in Ohio fields. Spray program is indicated as necessary for crop production. Reduction in yield 10 percent." M. W. Gardner reported the disease in California.

Erwinia carotovora, soft rot, was reported much less prevalent in Massachusetts than for several previous years. Difficult to find roots rotted by soft rot for isolation (W.H.Davis). Trace loss in New York.

Fusarium root rot. New Hampshire.

Heterodera marioni, root knot nematode, was noted in one field in Kansas. Oklahoma, in Logan County.

Sclerotinia sclerotiorum, storage rot, was less prevalent this year, owing to the dry growing and storing seasons. (O.C.Boyd). Trace loss in New York.

Sclerotium rolfsii, southern blight. Texas.

Yellows (aster yellows virus). In Connecticut, A. D. McDonnell reported a count of 100 plants in one row showed 12 percent infection. O. S. Cannon reported 2 percent loss in the entire crop in Nassau County, New York -- Chupp estimated a trace loss for the State. Texas.

Root girdle (undetermined). Washington.

EGGPLANT. See SOLANUM MELONGENA.

ENDIVE. See CICHORIUM ENDIVIA.

ESCAROLE. See CICHORIUM ENDIVIA.

GARLIC. See ALLIUM SATIVUM.

HIBISCUS ESCULENTUS: OKRA:

Choanephora conjuncta, and C. cucurbitarum. Georgia (PDR 23:293).

Heterodera marioni, root knot nematode. Texas, 2 reports -- 3 percent loss in Bell County. Oklahoma.

Phymatotrichum omnivorum, root root, Texas.

Verticillium albo-atrum, wilt, was reported prevalent in New Jersey, but was not the cause of great losses.

HORSERADISH. See RADICULA AMORACIA.

IPOMOEA BATATAS. SWEETPOTATO:

Actinomyces sp., soil rot or pox, was observed in Middlesex County, New Jersey. Maryland reported the usual prevalence, 2 percent. In Louisiana L. H. Person reported a total loss of 4 percent. "Abundant rains during early part of growing season. Heavily infested fields are being taken out of sweet potato production." Texas. R. W. Samson in Indiana reported 3 percent loss in quality. Kansas, 1 percent loss.

Albugo ipomoeae-panduranae, white rust. Seveal reports from New Jersey, but damage was slight.

Aspergillus sp., storage rot. Oklahoma.

Ceratostomella fimbriata, black rot. New Jersey reported heavy losses in isolated areas. R. A. Jehle in Maryland reported field losses amounting to 5 percent. In Louisiana the greatest loss resulted from early washed potatoes for early shipment. Texas, well scattered through the eastern section of the State. Oklahoma. Iowa, trace. O. H. Elmer reported black rot more prevalent in Kansas than in 1938, estimated total loss 2 percent. In California John T. Middleton reported a total loss of 30 percent. "Increased incidence in southern California due to importations of badly infected seed stock."

Corticium solani, rhizoctonia, was common in hot beds in Kansas, according to O. H. Elmer.

Diaporthe batatatis, dry rot, New Jersey.

Diplodia tubericola, Java black rot. Oklahoma.

Fusarium bulbigenum batatas and F. oxysporum f. 2, stem rot and wilt. Found in Connecticut only in Windsor, according to J. G. Horsfall, who stated that the disease came into the State on southern plants. Mostly confined to Eastern Shore Counties in Virginia, according to Harold T. Cook, who estimated 10 percent loss. Maryland 4 percent loss. In Louisiana, L. H. Person reported a trace loss. Oklahoma. R. W. Samson estimated 10 percent loss in quality in Indiana. G. C. Kent in Iowa reported 10 percent reduction in yield. Kansas, 8 percent loss (C.H.Elmer). In California John T. Middleton reported that the disease was only noticed in storage.

F. oxysporum, surface rot, was very common in Oklahoma according to K. S. Chester. Estimated loss in quality in Iowa was 2 percent. Fusarium spp. caused a surface rot of sweetpotatoes in Texas (PDR 24:183).

Heterodera marioni, root knot nematode. Virginia (PDR 23:98). Oklahoma.

Monilochaetes infuscans, scurf. New Jersey. Estimated losses were reported as follows: Maryland and Kansas 0.5 percent each, and California 10 percent. Phymatotrichum omnivorum, root rot. Texas. Plenodomus destruens, foot rot. Maryland. Pythium aphanidermatum, leak. California. P. ultimum, mottle necrosis. Maryland, trace loss; Iowa, 1 percent; California.

Rhizopus spp., including R. nigricans, soft rot, was reported from New Jersey; very common in Oklahoma; 8 percent loss in Iowa and 5 percent in Kansas. Rhizoctonia bataticola, charcoal rot. Texas. Verticillium albo-atrum, wilt. California.

Mosaic (virus). Iowa. Noted on Nancy Hall in Kansas.

LACTUCA SATIVA. LETTUCE:

Botrytis cinerea, gray mold rot, caused a loss of 3 percent in Massachusetts. A trace loss was reported in New York. O. S. Cannon reported "5 percent loss in Nassau County. Very serious in coldframe lettuce from March 15 to May 15." North Carolina (PDR 23:138).

Bremia lactucae, downy mildew, was less prevalent this year in Massachusetts owing to the dry season. Connecticut, "Disease common on older leaves." In New York it was said to be much less prevalent than for several previous years. Nassau County reported a trace loss in coldframe lettuce. Florida. Washington, in Pierce County. California in San Mateo, Santa Cruz and Monterey Counties (M.W.Gardner). (PDR 23:200).

Corticium solani, bottom rot. In Massachusetts O. C. Boyd reported 2 percent loss. Connecticut reported a trace loss. In New York, A. G. Newhall reported the disease present as usual but since lettuce is not being grown as much as in the past, losses were less for the St te. More Iceberg is being grown each year. The disease probably will be serious again in 1940. Washington.

Heterodera marioni, root knot nematode. Oklahoma.

Marssonina panattoniana, anthracnose, was present on fall (1938) and spring (1939) crops near Rochester, New York and caused considerable local loss. Probably seed borne (A.G.Newhall). Also caused some damage to leaf lettuce in greenhouse in Monroe County.

Phytomonas viridilivida, bacterial rot. New Hampshire and Washington.

Pythium spp., including P. ultimum, wilt, stunt and damping-off. In New York A. G. Newhall reported that wilt caused rather serious injury to one field in Erie County, also one in Oswego and one in Genesee Counties. (PDR 23:138,205).

Sclerotinia sclerotiorum, drop, was much less prevalent in Massachusetts owing to the unusually dry season (O.C.Boyd). New York estimated a loss of 1 to 3 percent. O. S. Cannon reported 3 percent loss for total crop in Nassau County with injury most serious in cold-frames. (PDR 23:170). North Carolina (PDR 23:138). Ohio, 1 percent reduction in yield (J.D.Wilson). Washington and California. (PDR 23: 200).

Septoria lactucae, leaf spot. In New York, Newhall reported specimens of Romaine and Iceberg lettuce severely affected from one farm in Nassau County -- loss 50 percent. Specimens were collected in Oakland County, Michigan, according to R. W. Lewis.

Tipburn (non-parasitic). Connecticut. New York, O. S. Cannon reported 5 percent loss in Nassau County -- very severe in late field plantings. Newhall reported it rather serious at times -- 90 percent loss in mid-summer on muck Iceberg in a few instances. M. B. Linn reported a small loss in early summer crop on Staten Island. New Jersey, less than usual. Wisconsin and Washington.

Virus diseases: All conditions were favorable to heavy leaf-hopper vector infestations in New York, consequently aster yellows was more prevalent than for several previous years. On Staten Island the disease was severe on midsummer and fall crops. The latter crop plantings have been less and less each year because growers anticipate heavy losses. Dusting with pyrethrum-sulfur dust will help control (M.B.Linn). Aster yellows was reported by M. W. Gardner in Monterey County, California. Big vein was less in amount than in previous years, on Staten Island, New York, according to M. B. Linn, who stated that evidence is accumulating that this disease is carried overwinter in the soil. Mosaic was present in Connecticut. In New York, on Staten Island, mosaic averaged about 4 percent in the worst affected fields but on the average was less than in previous years. Apparently a relatively small amount of seed was infected (M.B.Linn). In Nassau County on Long Island, O. S. Cannon reported that some fields of romaine lettuce had been found with as high as 15 percent of the plants exhibiting symptoms of mosaic. Washington. Spotted wilt was reported in California by M. W. Gardner who stated that the dry fall favored its spread.

Wind damage. New York (PDR 23:205).

LETTUCE. See LACTUCA SATIVA.

LYCOPERSICON ESCULENTUM. TOMATO:

Alternaria solani, early blight, was reported destructive in some States. Massachusetts reported much less than last year owing to the dry weather in July and August -- total loss estimated at 5 percent. In Connecticut J. G. Horsfall reported 10 percent reduction in yield plus 10 percent loss in quality. The disease was much more serious on ground plants than on staked plants presumably because of air drainage. Charles Chupp reported the disease statewide in New York, 5 to 10 percent loss. "Much rain just as plants were set into the field started a small epidemic in the State. Subsequent dry weather made the fungus disappear, so that the total loss for the season was much less than in 1938." R. E. Vaughan in Wisconsin reported 20 percent loss, and stated that attention was being given to new sprays and possibility of developing resistance by O. D. Whipple. Delaware and Indiana each reported 10 percent loss. H. R. Thomas in Indiana said that a large number of plants from the South had collar rot. There were serious losses in transplants early in the season, in addition to blight later on. In Dade County, Florida, G. D. Ruehle reported that the dry soil lowered the resistance of plants to infection and it was difficult to determine how much of yield reduction was due to blight and how much to drought -- 10 percent reduction in yield was estimated for the County. Losses for other States reporting are given in Supplement 127. Kansas reported the disease not so abundant as in 1937. In California, J. T. Middleton reported early blight much more prevalent than for several previous years -- unusual winter rains increased incidence of the disease.

Alternaria tomato, nailhead spot, caused 1 percent loss in Delaware and Wisconsin and a trace loss in Louisiana. Texas. In Oklahoma the disease was said to be very destructive during mid-season in experimental plants at Woodward. R. W. Goss reported its occurrence in Nebraska. Arizona estimated 5 percent loss.

Alternaria spp. ? fruit spot, was reported in California by John T. Middleton, who stated that the disease was new and only recently noticed, very little known. Apparently may be very serious.

Botryosporium pulchrum, mold, was reported on tomato leaves in the greenhouse, in Nacogdoches County, Texas by P. A. Young.

Cladosporium fulvum, leaf mold, was found in the field in Connecticut, which is unusual. In New York, Charles Chupp reported 1 to 2 percent of greenhouse crop was a total loss. There was a trace on outdoor tomatoes. Bay State and Vetomold proved promising resistant varieties in the greenhouse this season. In Texas, P. A. Young said that leaf mold was severe in one large field in Atascosa County. R. E. Vaughan reported resistant varieties showing promise with a few growers in Wisconsin. In Iowa a trace loss was reported by J. H. Standen. Kansas, in some greenhouses. Washington, in Spokane County.

Colletotrichum phomoides, anthracnose or ripe rot, was said by Charles Chupp in New York to be slightly more than last year, but not nearly so prevalent as in 1937 -- estimated loss, trace to 1.5 percent. The Plant Pathology Department of New Jersey reported the disease more severe than in 1937 and 1938. In 81 fields, all except 3 showed infection. Sixteen fields that showed severe anthracnose averaged 3.6 bushels per acre. The fields that showed slight anthracnose yielded 7.06 bushels per acre. Maryland reported a trace loss. Ohio. H. R. Thomas in Indiana reported the disease more prevalent than last year or in an average year -- estimated loss was 8 percent. The rainfall in June and July was above normal. M. C. Strong reported a trace loss in Michigan. Kansas.

Corticium solani, stem and soil rot. Texas reported a trace loss. J. T. Middleton reported stem rot particularly severe at San Juan Capistrano, Orange County, California, following rains in fields with poor drainage -- attacking mature plants -- and also reported it in Los Angeles County. He reported soil rot in San Diego County.

Cuscuta sp., dodder. Texas (PDR 23:138).

Erwinia carotovora, soft rot, accompanied a great deal of fruit cracking in Arkansas (S.B. Locke).

Fusarium bulbigenum lycopersici, fusarium wilt, was reported from 29 States. In most States it is controlled largely by the use of resistant varieties. In Massachusetts the disease was less in field tomatoes than under glass. J. G. Horsfall reported 5 percent reduction in yield in Connecticut. "It seems that resistant varieties like Rutgers leave something to be desired." Charles Chupp said this disease was rare in New York. "Isolated it twice this season -- once from material on Long Island and once from Chautauqua County." Nassau County estimated 1 percent loss. Reported from all parts of New Jersey, but not severe.

Virginia estimated the same loss as last year, 10 percent. In Florida, according to G. D. Ruehle, fusarium wilt is found on the early crop planted on rockland, but does not become serious on the main crop planted on marl prairies. General distribution in Texas (PDR 24:41-43). Nebraska. Losses in Utah were not significant. (PDR 24: 292-297). Wilt in California was more prevalent than usual. One field of 50 acres showed 75 percent loss. Santa Clara Canner variety was very susceptible. For estimates of loss for other States, see Supplement 127.

Heterodera marioni, root knot nematode, caused a trace loss in New York in greenhouses. New Jersey, in Middlesex County. It was found causing serious damage in several fields of tomatoes in southwest Texas. (PDR 24:41-43). Estimated loss was 2 percent. Oklahoma estimated 5 percent reduction in yield, and Virginia 1 percent. Traces were noted in Michigan, Wisconsin, and Iowa. J. C. Miller stated that tomato plants in Reno County, Kansas were severely damaged.

Mycosphaerella sp., South Carolina. (PDR 23:309).

Phoma destructiva, black spot, in New York caused a trace loss. The dry hot weather seemed to keep the fungus in check (Charles Chupp). Texas, 2 percent loss in southwest region (S.S.Ivanhoff).

Phoma and Colletotrichum fruit rots in Ohio, caused 3 percent loss according to J. D. Wilson.

Phymatotrichum omnivorum, root rot. Texas.

Phytomonas michiganensis, bacterial canker, in Massachusetts was seen in only one field -- 25 percent infection with 15 percent loss was estimated. A trace loss was estimated for the State (PDR 23:261). In New York Charles Chupp reported, "In the western half of Chautauqua County, many farmers insist on planting tomatoes after tomatoes and almost invariably have trouble with bacterial canker. This year many of the southern-grown plants were infected. I saw fields where the entire crop was lost." Cannon reported the disease present in a few fields in the Hudson Valley. In Nassau County, very destructive in fields, the seed for which was saved by the farmers. Estimated loss trace to 0.25 percent. New Jersey, "Plants came from Georgia." Other States reporting less than 1 percent were Pennsylvania, Virginia, Texas, Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, and Washington. In Maryland 1 percent loss was recorded. Utah reported the highest estimate, which was 6.4 percent (PDR 24:292-297). J. B. Kendrick in California reported canker more prevalent than in 1938. While general in occurrence -- not many fields sustained severe damage -- tied in with contaminated seed.

Phytomonas solanacearum, bacterial wilt, was reported in New Jersey. In Monmouth County, home-grown plants were set in field where eggplants had died during the wet period of 1938. North Carolina reported 7 percent reduction in yield; Virginia, 2 percent; Delaware, 1 percent; and Maryland, Texas, Indiana, Illinois, and Arizona, less than 1 percent. In Indiana H. R. Thomas reported some spread throughout the season through run-off water, increasing amount of damage. P. vesicatoria, bacterial spot, was not reported this year in New York (Charles Chupp). The highest estimate of loss was 1 percent in Michigan, Minnesota, and Oklahoma. G. D. Ruehle in Dade County, Florida, reported losses from 25 to 50 percent on some farms, but loss for the entire acreage (11,000A) was less than 19 percent, because the main crop in late winter and early spring was nearly free of this disease. It was much more prevalent than in 1938 or in an average year, estimated loss 0.8 percent. Other States reporting less were Connecticut, Pennsylvania, Maryland, Virginia, Texas, Arkansas, Ohio, Indiana, Illinois, Iowa, and North Dakota.

Phytophthora infestans, late blight, was generally unimportant this year. O. C. Boyd stated that it was not reported in Massachusetts. In Connecticut, James G. Horsfall remarked, "It seems noteworthy that this disease should have flared up in the early thirties and has died down again." Noted in Middlesex County, New Jersey. In Florida, G. D. Ruehle reported, "Fruit infection in late shipments developed in transit. A few specimens observed in fields."

Phytophthora parasitica, buckeye rot. Usual prevalence in Maryland, a trace loss. Texas, Dewitt and Lavaca Counties reported a trace. Dimmit County and throughout the Southwest region, 2 percent loss. (PDR 24:41-43). In California, M. W. Gardner reported the disease occurred in the late crop at Brentwood on green fruits in irrigation furrows.

Pleospora lycopersici, fruit rot, was reported in 7 counties in southern California by J. T. Middleton, who remarked, "First records of this disease were noted in the field in southern California." M. W. Gardner reported observations in Contra Costa and Alameda Counties.

Pythium sp., damping-off. Texas.

Sclerotium rolfsii, southern blight. In New Jersey the Plant Pathology Department reported, "Approximately 25 percent showed visible symptoms of wilt before shipping." H. R. Thomas in Indiana reported the disease much less prevalent than for several years. "Only found on out-of-state plants. Dry May and no hold over of plants. Plants were placed in field immediately upon receipt from South." Estimated losses were reported as follows: Texas, 3 percent; Delaware and North Carolina, each 1 percent; Pennsylvania and Virginia, each a trace.

Septoria lycopersici, leaf spot, was reported generally less prevalent than in 1938. Twenty-two States reported its occurrence. States reporting the highest losses were Indiana, 20 percent; Delaware, Wisconsin, and Iowa, each 10 percent; Ohio, 9 percent; Minnesota and Kansas, each 2 percent; and the remaining States, 1 percent or less.

Stemphylium [solani], South Carolina (PDR 23:309).

Verticillium albo-atrum, verticillium wilt. Utah (PDR 24:292-297). California, in Los Angeles, Orange, Riverside, and San Diego Counties (John T. Middleton). Verticillium sp., wilt, caused a trace loss in Massachusetts (O.D.Boyd).

Blossom end rot (non-parasitic) was reported from 23 States and was generally more prevalent than in 1938. State reports with comments follow: Massachusetts, more prevalent than last year or for several previous years, estimated loss 4 percent; Connecticut, much more prevalent than for several previous years, bad drought and quite warm during July and early August, estimated reduction in yield was 20 percent. Much more serious on staked plants than on ground plants. For effect of wind on blossom-end rot see Reporter 23:307-308 (J.G.Horsfall). In New York, the hot drying winds coupled with loose sandy or gravelly soils caused nearly every fruit in a few fields to be affected. Almost every field in the State had some loss. Total loss estimated at 2 to 5 percent (Charles Chupp). In New Jersey according to the Department of Plant Pathology the disease was prevalent and severe in Cape May, Hudson, Essex, Somerset, and Union Counties. Delaware and Pennsylvania, each reported 5 percent loss; Maryland 1.5 percent loss; West Virginia, Oklahoma, and Iowa, each 3 percent loss. The highest estimated loss was 10 percent for Arkansas and Arizona. North Carolina 2 percent. States reporting 1 percent were Texas (PDR 24:41-43), Ohio, and North Dakota. Other States reported less.

Blotchy ripening (non-parasitic) in New York, according to Charles Chupp, was important enough to greenhouse men, so that they requested the College to do some research on the subject. On July 3, Ralph G. Palmer (Monroe County) reported that blotchy ripening had begun to appear on greenhouse tomatoes although not so seriously as the last few years. "The fertilizer experiments are showing considerable difference in the amount of this difficulty which leads us to believe that we will find at least a partial remedy for this problem." Washington.

Fruit pox. Arkansas (PDR 24:177).

Psyllid yellows (caused by feeding of tomato pyllid) was not observed or reported in Utah this year (PDR 24:292-297). Texas, Cameron and Hidalgo Counties, trace to 5 percent loss.

Virus diseases. Curly top or yellows. Curly top affected occasional plants in Southwest Texas (PDR 24:41-43). Less curly top in 1939 than in any single year for the past decade in Utah (PDR 24:292-297). J. G. Brown reported yellows common in Arizona wherever tomatoes are grown.

It is the worst disease of tomatoes there, occurring throughout the long growing season. Losses from curly top on tomatoes were much less in 1939 than in 1938 for both Oregon and Washington (PDR 24:133). In California, John T. Middleton reported curly top causing 20 percent infection in San Fernando Valley. J. B. Kendrick reported curly top more prevalent than in past few years, especially in the San Joaquin Valley. A few fields showed 75 percent damage but average damage in this area was not over 5 to 10 percent. The increase was probably due to the greater insect populations during the early part of the season. M. W. Gardner reported curly top in the central and western parts of the State.

Bunchy top (probably a virus) Texas.

Mosaics (viruses mostly not distinguished) as usual were generally reported, and much more destructive in some States than last year. O. C. Boyd in Massachusetts estimated 4 percent loss, which is much more than last year. Charles Chupp in New York reported mosaic statewide. "Although dry hot weather permitted long distance flights of insect vectors, the canning crop of tomatoes was relatively free of mosaic, because of the care in growing the young plants. Some local gardeners had almost 100 percent crop infection." According to O. S. Cannon and M. B. Linn, the same was true for Nassau County and Staten Island. Of the 26 States reporting, Florida reported the highest loss, 7 percent; Oklahoma, 3 percent; Louisiana, 2.5 percent; New York, Delaware, and Virginia, each 2 percent; Pennsylvania, Maryland, Minnesota, and North Dakota, each 1 percent. The remaining States reported less. In California John T. Middleton reported "5 acres in Riverside County a total loss. Necrosis on fruits was very common. Meristematic regions destroyed." Filiform mosaic (cucurbit virus): In California, M. W. Gardner reported, "Only a trace at Brentwood, whereas in 1938 it was a major disease." (PDR 23:259-260; 24:41-43, 292-297).

Ringspot (virus) was noted in some abundance late in the season in canning fields of tomatoes in southern Indiana according to R. W. Samson, who estimated a trace loss.

Spotted wilt (virus) caused a trace loss in Delaware. In Ohio it destroyed the crop in a few local fields near Cleveland (PDR 23:342). Texas and Michigan each reported a trace loss. The first definite report of occurrence in Missouri on tomato was sent in by John T. Middleton and C. M.Tucker (PDR 23: 204, 259-260). The usual prevalence was observed in California according to John T. Middleton and M. W. Gardner.

Streak (virus) was reported causing a trace loss in each of the following States: New York, Pennsylvania, Texas, Oklahoma, Wisconsin, and Idaho. Washington reported 0.2 percent loss. Streak was not observed in Utah this year (PDR 24:292-297).

Yellow-top. Texas (PDR 24:41).

MANGEL-WURZEL. See BETA VULGARIS MACRORHIZA.
MUSKMELON. See CUCUMIS MELO.
OKRA. See HIBISCUS ESCULENTUS.
ONION. See ALLIUM CEPA.
PARSNIP. See PASTINACA SATIVA.

PASTINACA SATIVA. PARSNIP:

The only reports of disease on parsnip were of leaf spots caused by *Cercospora apii-pastinacae* in Massachusetts, *Cercosporella pastinacae* in New York and California and *Ramularia pastinacae* in Massachusetts and New York.

PEA: See PISUM SATIVUM.
PEPPER. See CAPSICUM ANNUUM.

PHASEOLUS AUREUS. MUNG BEAN:

Erysiphe polygoni, powdery mildew, was reported from California by J. T. Middleton. *Pythium* spp., stem rot. California. *Rhizoctonia bataticola*, charcoal rot. California (PDR 24:25).

(PHASEOLUS LUNATUS MACROCARPUS) LIMA BEAN. PHASEOLUS LIMATUS:

Diaporthe phaseolorum, pod blight, was less prevalent in New York than last year or for several previous years -- a trace loss was estimated (Charles Chupp). Connecticut and Maryland also reported a trace loss.

Phytomonas medicaginis phaseolicola, halo blight, was common on lima bean plantings on Long Island, New York (PDR 23:262); in Virginia, it caused a reduction in yield of 6 percent plus 6 percent loss in quality, according to Harold T. Cook. *P. phaseoli*, bacterial blight, was collected in Ingham and Oakland Counties, Michigan. The disease was found on every plant in one field (R.W.Lewis). *P. syringae*, bacterial spot, was less prevalent in New York than for several previous years according to Charles Chupp -- a trace loss was estimated. Usual prevalence in Maryland -- 0.5 percent loss.

Phytophthora phaseoli, downy mildew. New York, "No losses reported" (Charles Chupp); New Jersey in Middlesex County; Maryland, usual prevalence -- 2 percent reduction in yield.

Rhizoctonia bataticola, charcoal rot. California.

Uromyces phaseoli typica, rust, caused a trace loss in Maryland according to R. A. Jehle.

Mosaic (virus) was reported from California by J. T. Middleton as follows: 10 percent infection, Venice -- 5 percent infection, Bellflower.

PHASEOLUS VULGARIS. BEAN.

Colletotrichum lindemuthianum, anthracnose, was reported from 14 States. The highest loss, 5 percent, was reported in Dade County, Florida by G. D. Ruehle, who said the "Disease was severe in several fields planted to Tendergreen variety and it had spread slowly to adjacent fields of Black Valentine." Delaware estimated 3 percent loss. Pennsylvania, Maryland, and West Virginia each estimated 2 percent reduction in yield. North Carolina, Ohio, and Iowa, each reported 1 percent loss. States reporting less than 1 percent were Massachusetts, New York, New Jersey, Louisiana, Texas, Michigan, and Kansas. In reporting from Louisiana, L. H. Person said "One commercial field of 3 acres was a total loss. First time this disease has been observed in a commercial field in 3 years." In Iowa, J. H. Muncie reported anthracnose on field beans for the first time in many years.

Corticium solani, stem canker, was reported from 15 States with losses ranging from a trace to 2 percent. See Supplement 127 for estimated reduction in yield on green beans and dry beans.

Erysiphe polygoni, powdery mildew, was reported causing the most damage in Virginia, where a loss of 10 percent was estimated by Harold T. Cook. The most susceptible variety was Bountiful. North Carolina and Ohio each reported 2 percent, Texas 1 percent. Delaware 1 percent loss in dry beans. The remaining 7 States reported a trace loss. California reported its occurrence, but did not give any loss estimate.

Fusarium spp., root rots, in Massachusetts were much less prevalent than last year, according to O. C. Boyd, who estimated 2 percent loss. Maryland reported the usual prevalence with 2 percent loss. Pennsylvania, 4 percent loss. Ohio, 1 percent loss. Texas and Washington. F. solani var. martii f 3, dry root rot, in New York caused a loss of 3 percent, according to Charles Chupp, who remarked, "Even though there generally is less root rot than formerly, there was more present than for the last few years." For loss estimates for the remaining 14 States reporting, see Supplement 127.

Heterodera marioni, root knot nematode, was reported in Burlington County, New Jersey by the Department of Plant Pathology. In Louisiana the disease was found in one sandy field -- 100 percent of plants infected but causing little damage. (L.H.Person). Oklahoma, in Logan County. J. C. Miller reported that bean plants in a garden in Edwards County, Kansas were severely damaged by nematodes.

Macrophomina phaseoli, ashy stem blight. L. H. Person remarked, "First report of the Macrophomina stage of the disease", in Louisiana. Also first report from Arkansas (PDR 23:278-279) and Texas to the Survey.

Phytomonas flaccumfaciens, bacterial wilt, was less prevalent than last year in Michigan according to J. H. Muncie, who estimated

0.2 percent loss.

Phytomonas medicaginis phaseolicola, halo blight. In Massachusetts O. C. Boyd reported that halo blight combined with common blight (P. phaseoli) caused a total loss of 2 percent. The combined loss in Illinois was 3 percent. Halo blight in Connecticut was reported causing 5 percent reduction in yield. Charles Chupp reported 1 to 2 percent loss in New York. In Nassau County on Long Island it was epiphytotic in late snapbeans in September causing as much as 75 percent loss in single fields according to O. S. Cannon. (PDR 23:262; 24: 37-40). Pennsylvania, Montana, Idaho, and Washington, each reported a trace loss. According to Harold T. Cook halo blight in Virginia was less prevalent than in 1938, estimated reduction in yield was 8 percent. North Carolina reported 2 percent reduction in yield. G. R. Townsend in Florida reported halo blight much less prevalent than last year -- estimated reduction in yield was a trace. Outbreaks were traced to infected seed from Wyoming. There was less in homegrown seed. Texas, in Webb County (PDR 24:41-43). J. H. Muncie reported 0.5 percent loss in Michigan. R. E. Vaughan reported 2 percent loss in Wisconsin. In Michigan 0.5 percent loss was estimated on dry beans, while 1 percent was reported in Wyoming. Nebraska and Wyoming reported the disease much less prevalent than in 1938, the latter State estimated 2 percent loss on green beans. G. H. Starr remarked, "Very few seed beans grown -- mostly Great Northern and Pinto varieties." Washington, in Spokane County. P. phaseoli, common blight, was reported from 26 States this year. Percentage losses were: Vermont, trace on dry beans; Massachusetts, 2; New York, Texas, North Dakota, Montana, trace; Pennsylvania, 0.5; Delaware, 2 on green beans and 1 on dry beans; Virginia, 1; Oklahoma, 3; Ohio, 1; Indiana, 1; Wisconsin, 1 on green beans, 1 on dry beans; Michigan, 2; Wyoming, 1 on green beans, 0.5 on dry beans. In Maryland, West Virginia, Louisiana, Minnesota and Iowa common and halo blights and bacterial wilt (P. flaccumfaciens) combined, 3, 3, 5, 4 and 6 respectively. In Illinois common and halo blights combined, 3; no estimates were given for Connecticut, New Jersey, Nebraska, Kansas, and Washington.

Rhizoctonia microsclerotia, web blight, damaged a small field of Bountiful and Great Northern beans late in August in South Carolina (PDR 23:308). This is the first report to the Survey from this State. In Louisiana L. H. Person reported, "First time the microsclerotia have been observed on leaves and stems of bean plants. Spots have been observed previously on pods. Several fields observed were a total loss due to the disease."

Sclerotinia sclerotiorum, blight, in Massachusetts, was observed in only 2 or 3 home gardens when vine growth was very dense. Found on both branches and pods, particularly when touching the ground. Least seen in years (O.C.Boyd).

Sclerotium rolfsii, southern wilt, in Louisiana was found mostly on sandy lands in early sown fall beans during hot weather, estimated loss, a trace (L.H.Person). Texas.

Uromyces phaseoli typica, rust, was reported less prevalent than in 1938. In Massachusetts, according to Boyd none was seen on bush beans and only slight damage anywhere on pole beans. In New York Chupp reported rust mostly on Kentucky Wonder pole bean or very late planted bush varieties, estimated loss a trace. New Jersey, "Not so abundant as in 1938." Traces of loss were reported in Pennsylvania, Maryland, Florida, Texas, Illinois, Wisconsin, Montana, Wyoming, and Washington. In Wyoming, G. H. Starr reported a few fields of Pinto beans severely infected with considerable loss in a small area near Manderson, Big Horn County. This was the first time it had been found in commercial fields in Wyoming. Harold T. Cook in Virginia reported the same loss as last year, 10 percent. "Severe epiphytotics occur annually in late summer and fall. A few years ago rust was rarely found in this area. L. L. Harter reports our rust this year to be his form 10." Other losses were: North Carolina and Oklahoma, 2 percent each; Michigan, 0.1 percent on dry beans. Observations were reported in New Hampshire and West Virginia.

Virus diseases: Curly top was observed in Texas and Washington. Idaho reported 2 percent reduction in yield.

Mosaic was reported from 20 States. Losses ranged from a trace in some States to 5 percent in Delaware, Oklahoma, and Idaho on dry beans. See Supplement 127. Yellow mosaic was reported from New York (PDR 24:37-40) and Texas.

PISUM SATIVUM. PEA:

Alternaria blight. New Hampshire.

Root rot caused by various organisms: Alphanomyces euteiches, caused losses reported as 8 percent in Pennsylvania; 3 percent in Maryland; 1 percent in Wisconsin; 3 percent in Montana (this includes Fusarium). Aphanomyces plus other organisms caused 25 percent loss in Massachusetts according to O. C. Boyd, who said that loss is much heavier every year in home gardens than in commercial plantings. In New York, Chupp reported root rot statewide with a total loss of 8 to 12 percent. "Apparently in this State a Pythium is most commonly present in pea root rot, but the Geneva Agricultural Experiment Station has found that there are almost 20 soil organisms which, if given the correct conditions, may cause pea root rot." Fusarium spp. including F. solani martii f.2 was reported from 9 States with the following percentage losses: Pennsylvania, 1; Ohio, 5; Illinois, trace; Michigan, 0.1; Wisconsin, trace; Montana, 3 (this includes Aphanomyces); Idaho, 2; Washington, 0.4 and Oregon, 1. Root rot caused by Pythium spp. was reported from Pennsylvania and Wisconsin, a trace; Michigan 0.1 percent; Washington 0.4 percent, and Oregon, 1 percent.

Ascochyta spp., ascochyta blights, caused a trace loss in Maryland. A. pinodella -- a trace loss in New York. A. pisi - a trace loss in New York, Pennsylvania, and Michigan; 3 percent in Louisiana and Oregon and 0.5 percent in Washington. (See also Mycosphaerella pinodes).

Choanephora conjuncta. Georgia (PDR 23:293).

Cladosporium pisicola, scab, caused 0.4 percent loss in Washington and 2 percent in Oregon.

Erysiphe polygoni, powdery mildew, was reported from 10 States again this year, but it was of minor importance except in Oregon, where 5 percent loss was estimated.

Fusarium sp., wilt, was rarely found in New York according to Charles Chupp. Washington. F. orthoceras pisi was more prevalent in Maryland and Wisconsin. according to Jehle and to Vaughan, estimated losses were 0.5 and 1 percent respectively. F. oxysporum f. 8 near wilt, was reported causing a reduction in yield of 2 percent in Wisconsin. Washington, in Columbia County.

Heterodera marioni, root knot nematode. Texas.

Mycosphaerella pinodes, blight, was of little significance this year in the East. Chupp reported a trace loss in New York. According to Vaughan it was less prevalent than last year in Wisconsin. Washington reported 0.5 percent reduction in yield and Oregon, 7 percent.

Peronospora pisi, downy mildew, was rare in New York this season, according to Charles Chupp. Wisconsin reported much less, only a trace loss. Washington, "occurrence in rather severe form.....in the Palouse country as well as in other sections of the State." (Wash. Bull. 384: 62. 1939).

Phytomonas pisi, bacterial blight, was not reported in New York this season according to Charles Chupp. Losses from other States were reported as follows: Maryland, 1 percent; Michigan, trace; Wisconsin, trace, "Considerable damage to early planted fields in northwest Wisconsin -- followed storm injury by sand and rain"; Minnesota, 4 percent, "Reports indicate that this disease was more prevalent this year than for some years previously, although one grower says he has it every year"; North Carolina, 2 percent; Oklahoma, 3 percent, and Montana, a trace.

Pythium ultimum, damping-off, occurred in occasional plantings in Riverside County, California.

Rhizoctonia solani, stem rot, was observed in 7 States causing the following losses: New York, Pennsylvania, Montana, and Idaho, each a trace; North Carolina, 1 percent; Michigan, 0.1 percent and Washington, 0.4 percent. In Michigan stem rot was found only on heavy, poorly drained soils.

Sclerotinia sclerotiorum, sclerotinia wilt, Washington.

Septoria pisi, leaf blotch, was reported rare this season in New York. Less prevalent in Wisconsin owing to the dry weather.

Mosaic (virus) was much less serious than during the two preceding years in Nassau County (Long Island) New York (O.S.Cannon). Charles Chupp reported, "Upstate we generally have had little trouble with pea mosaic, but this season, for some as yet unexplained reason, pea virus 1 caused an almost entire failure in the Geneva Hall district of Ontario County. Virus 2 and streak also were present but seemed to do little damage." (PDR 23:170, 218). In Michigan, J. H. Muncie reported a trace loss.

Drought and heat injury in Iowa caused 25 percent loss in Iowa according to I. E. Melhus; 20 percent in New York; 15 percent in Delaware; 5 percent in North Carolina and 3 percent in Washington.

POTATO. See SOLANUM TUBEROSUM.

(RADICULA ARMORACIA) HORSERADISH. RORIPA ARMORACIA:

Albugo candida, white rust, was reported a few times from New York. J. D. Wilson reported 1 percent reduction in yield in Ohio. It was reported in Berrien County, Michigan by R. W. Lewis. This is the first report to the Survey from this State.

Ramularia armoraciae, leaf spot, was present rather generally in New York, but only caused a trace loss according to Charles Chupp.

RADISH. See RAPHANUS SATIVUS.

RAPHANUS SATIVUS. RADISH:

Albugo candida, white rust, in Wisconsin was reported "more prevalent in greenhouse crop than in gardens. It is controlled by paying attention to ventilation." New York also reported the disease troublesome in a few greenhouses. Michigan, in Clinton and Oakland Counties.

Alternaria herculea, leaf spot. Oakland County, Michigan.

Peronospora parasitica, downy mildew, was reported less prevalent than usual in New York owing to the hot dry weather. In Nassau County, O. S. Cannon said the disease appeared occasionally in irrigated radishes. Losses slight. (PDR 23:170).

Phytomonas campestris, black rot. Michigan.

Pythium aphanidermatum, black root, was reported less prevalent than for several years in Wisconsin.

RHEUM RHAPONTICUM. RHUBARB:

Ascochyta rhei, leaf spot. Connecticut and New Jersey.

Phyllosticta straminella, leaf spot. In New York Charles Chupp reported that it was difficult to find a planting not affected; however, it was less sèvere than usual -- estimated loss, a trace. R. S. Kirby in Pennsylvania also reported a trace loss. The usual prevalence was reported in California by John T. Middleton. Crown rot caused by Phytophthora spp., Rhizoctonia solani and Pythium spp. was reported in California by John T. Middleton.

RHUBARB. See RHEUM RHAPONTICUM.
RUTABAGA. See BRASSICA CAMPESTRIS.
SALSIFY. See TRAGOPOGON PORRIFOLIUS.

SOLANUM MELONGENA. EGGPLANT:

Alternaria solani, early blight, in Massachusetts, was less prevalent than for several previous years, owing to the dry season (PDR 23: 237). The dry hot weather in upstate New York also was unfavorable.

Cuscuta sp., dodder. In Kansas, J. C. Miller reported "Eggplants in Douglas County patch were stunted and killed by dodder growing on them."

Heterodera marioni, root knot nematode. Texas. Eggplants in Sedgwick County, Kansas showed damage from nematodes.

Phomopsis vexans, phomopsis blight, was less prevalent in Massachusetts owing to the dry season. Charles Chupp reported a trace loss in New York. "Because of high temperature, present upstate where it is rarely found." Fruit rot was observed in New Jersey, Michigan, Wisconsin, Oklahoma, and California. In Kansas, blight was severe on eggplants in Crawford, Neosho, Montgomery, Douglas, Wyandotte, Johnson and Shawnee Counties (J.C.Miller).

Sclerotium rolfsii, southern blight. Texas.

Verticillium sp., wilt, in Massachusetts was reported by O. C. Boyd causing a total loss of 20 percent. V. alboatrum, wilt. Connecticut. The dry hot weather in upstate New York seemed to reduce the amount of the disease according to Charles Chupp, who estimated 1 to 2 percent loss. New Jersey. In Iowa, I. E. Melhus reported 25 percent reduction in yield. "Probably first report. Seen in one planting on Muscatine Island." This is first report to the Survey from this State on eggplant. J. T. Middleton reported wilt in Los Angeles County, California.

"Bunchy top" was reported in southwest Texas (PDR 24:42).

Mosaic (virus). Texas. Yellows (virus) Texas in 7 counties -- severe where uncontrolled. (PDR 24:42).

SOLANUM TUBEROSUM. POTATO:

Losses from potato diseases in the Hastings section, Florida, in 1939, by A. H. Eddins are given in Reporter 23: 205-206.

Actinomyces scabies, scab, was reported generally more prevalent that in 1938, except in Florida where only 0.5 percent loss was estimated. G. D. Ruehle reported that farms severely infested in 1938 were planted to other crops in 1939. The disease was absent in some crops. In Pennsylvania O. D. Burke reported that the hot dry weather early was favorable to the occurrence of the disease. In Minnesota, Carl J. Eide said, "Scab was more destructive than last year. Deepscab was probably due in part to insects -- very destructive around Twin Cities." Twenty-nine States reported scab. Loss estimates of 1 percent or more were: Delaware and Michigan, 10; Virginia, 8; Pennsylvania, Texas, Indiana, and Iowa, 5; Minnesota, 4; New York, Maryland, and Oklahoma, 3; Massachusetts, West Virginia, North Carolina, Ohio, Montana, and Wyoming, 1.

Alternaria solani, early blight, as usual was widely distributed, 28 States reporting it. The highest losses were in Maine and Arizona, of 5 and 7 percent respectively. Loss estimates of 1 percent or more were: 2 percent in Michigan and Ohio; 1 percent in Vermont, New York, Pennsylvania, Delaware, Virginia, West Virginia, North Carolina, Florida, Louisiana, Texas, Wisconsin, and Minnesota. (PDR 23:200).

Corticium solani, rhizoctonia, was reported from 29 States, with variation in severity ranging from a trace in several States to 7 percent in Massachusetts. Boyd reported plenty of soil moisture at planting time; however, the depth of covering appeared to be a greater factor than soil moisture or temperature (PDR 23:228,343). Other loss estimates were: 5 percent in Montana; 4 percent in Pennsylvania, Minnesota, and Iowa; 2 percent in Indiana and Kansas; 1.5 percent in Maine; 1 percent in Vermont, New York, Maryland, Virginia, North Carolina, Florida, Oklahoma, North Dakota, Idaho, Arizona, and Washington. The remaining States reported less or did not send an estimate. (PDR 23:342; 24:173-175).

Erwinia carotovora, bacterial soft rot, caused a trace loss in Dade County, Florida, according to G. D. Ruehle, who stated, "One 30 acre field stand was reduced about 50 percent from seed-piece decay and blackleg. Seedpieces were infested when planted. Transit losses were reduced by improved methods of handling tubers in packing houses."

E. phytophthora, black leg, was reported from 27 States and was generally less prevalent than in 1938. West Virginia reported the highest loss, which was 2 percent. The next highest loss was 1 percent reported in Virginia, North Carolina, Oklahoma, Michigan, and North Dakota (PDR 23: 200).

Fusarium spp., wilt, was widely distributed as usual, but not over 3 percent loss was reported from any one of the 19 States reporting. For losses see Supplement 127. Fusarium seed-piece rot caused a trace loss in the Hastings region, Florida. The season was dry and the tempera ture was too high to be favorable for the disease (A.H.Eddins). F. avenaceum, wilt. Scattered distribution in Wisconsin, estimated loss a trace. F. oxysporum f. 1, wilt, was reported by K. H. Fernow causing a trace loss in New York. New Jersy, "Not of great economic importance." In Pennsylvania, O. D. Burke reported wilt of this type was more severe due to weather conditions, estimated loss 1.5 percent. North Dakota also estimated 1.5 percent. In Wyoming G. H. Starr reported all commercial varieties susceptible, estimated loss 1 percent. F. radicicola, stem-end rot. California. F. solani eumartii, wilt (Z-disease), caused a total loss of 1 percent in New York, according to K. H. Fernow. In Pennsylvania O. D. Burke reported the Z-disease more prevalent than for several previou years, estimated loss 1.5 percent. Michigan reported stem-end rot causing a trace loss. G. H. Starr in Wyoming reported less than last year or in an average year. Total loss 0.5 percent.

Heterodera marioni, root knot nematode. Oklahoma. California (PDR 24:64).

Phytomonas sepedonica, bacterial ring rot. The known distribution of ring rot of potatoes in the U. S. (with map) is given in Reporter 24:2-6. This is the first year ring rot has been reported from Massachusetts. It occurred on three farms, in each case certified seed from Maine was planted. (PDR 23:322,343). New York reported a trace loss. (PDR 23:261,281). In Pennsylvania, O. D. Burke reported the disease only on fields planted with seed from a source outside the State, estimated loss a trace. In the Hastings section of Florida, A. H. Eddins reported much less than in 1938. "Uncertified White Rose seed from Minnesota was worst affected, infection being about 11 percent of plants in 695 acres planted." (PDR 23:206). In Dade County, Ruehle reported "Seed free of disease in 1939." In Louisiana, L. H. Person reported, "First observation of ring rot in the State. Probably 3 to 4 percent observed in this field." K. S. Chester reporting from Oklahoma said the disease was "Not seen by us but we are advised that the trouble appears to be present in incoming shipping stock, according to the State market inspector, whose determinations are quite reliable." In Ohio, Paul E. Tilford reported that ring rot was located for the first time by Dr. C. C. Allison It was found in only one field in Wood County (PDR 23:346). J. C. Muncie reported ring rot present in 6 counties in Michigan. (PDR 24:6). In Wisconsin, R. E. Vaughan reported most on stock shipped in from North Dakota -- some on Chippewas shipped in from Maine. In Minnesota, C. J.

Eide reported ring rot found in River Valley and northeastern part of State, estimated total loss 6 percent. He stated that it was probably present in other parts of the State. The disease was discovered in one field in Iowa (PDR 23:370). In North Dakota the first case of potato ring rot was found and definitely identified in White Rose potatoes from the 1938 crop. It attracted serious attention from growers and buyers in 1939 and caused some serious losses (PDR 24:136). Estimated loss for State was 2 percent. A survey of bacterial wilt and ring rot of potatoes in Nebraska in the spring of 1939 is given in Reporter 23:288-290. In Kansas, O. H. Elmer reported, "The disease was not determined definitely but was undoubtedly present. Symptoms were largely masked because of extreme amount of tuber decay in July due to sunburn. Weather conditions made recognition of this disease difficult both as to plant wilt and as to tuber rot. Considerable amount of this disease was noted in the winter of 1939-1940 on seed stock shipped here from the North." G. H. Starr in Wyoming reported 1 percent reduction in yield plus 0.5 percent loss in quality. All commercial varieties were susceptible. (PDR 23:177). This is the first year that the disease has been definitely located in Idaho. It was found in nearly all of the potato growing sections of southern Idaho (PDR 23: 379). Loss was estimated at 1 percent. Washington (PDR 24:115). C. E. Owens reported ring rot definitely identified for the first time in Oregon. It probably occurred in 1938. About 5 percent infection was observed at Malheur, and less in Klamath County. (PDR 23:223). In California, J. B. Kendrick reported the disease generally distributed and more prevalent than in 1938. "Found severe in several localities in San Joaquin Island district -- also in Tulelake, Siskiyou County, in several plantings of Russets and White Rose. This was traceable to seed stock." (PDR 23:199,377). The two remaining States of the 21 reporting the disease are Maine, 1 percent loss, and West Virginia, a trace.

Phytomonas solanacearum, bacterial wilt, brown rot. Delaware, Virginia, and Oklahoma each reported 2 percent reduction in yield. Jehle reported 0.5 percent loss in Maryland which is less than in 1938. North Carolina estimated 3 percent loss. In the Hastings section of Florida, A. H. Eddins reported a total loss of 3 percent. He stated, "Maximum losses were avoided by planting resistant variety Katahdin on 7,000 of the 13,500 acres grown. The disease was severe on farms planted to Spaulding Rose." (PDR 23:206).

Phytophthora erythroseptica, pink rot, was reported from Massachusetts by O. C. Boyd for the first time. He stated that the disease was general in all fields on one large farm in Worthington, wherever storage rots were dumped last winter. There were traces elsewhere in the State. This is the second report to the Survey of pink rot in this country. Last year it was reported from Maine. (PDR 23:322,343).

Phytophthora infestans, late blight, was reported less to much less prevalent than in 1938 in practically all the 20 States reporting except Florida, Indiana and Michigan. In Dade County, Florida, G. D.

Ruehle reported 10 percent loss, and one of the driest seasons on record. A. H. Eddins reported 2 percent loss in the Hastings section. Susceptible varieties were Katahdin and Spaulding Rose. In Indiana, R. W. Samson reported 5 percent loss. "Spraying applied in many cases for leafhopper control but discontinued before conditions became favorable to late blight." J. H. Muncie reported 3.5 percent loss in Michigan. All commercial varieties were susceptible. Maine reported 1 percent loss as compared with 10 percent last year, and Vermont 4 percent as compared with 35 percent last year. In Massachusetts, O. C. Boyd reported 3 percent loss, much less owing to the fact that the weather was too dry and warm during July and August, and too dry during September. (PDR 23:228,343). In Connecticut it was said that the striking reduction over last year was probably due to dry weather during July and early August. New York reported late blight much less prevalent. K. H. Fernow sent in an estimate of 3 percent. (PDR 23:227, 281, 291). O. D. Burke stated that late blight was severe only in the southwestern part of the State, this being the only section in which conditions were favorable for the disease at any time. Estimated loss was set at 1 percent. Delaware reported an estimated loss of 10 percent. Maryland reported 5 percent reduction in yield plus 5 percent loss in quality, which indicates less prevalence than in 1938; however, Jehle reported it as very severe in Garrett County, where the loss was estimated at 50 percent. Harold T. Cook reporting from Virginia said, "Late blight was confined to the Eastern Shore in the area south of Cape Charles. Foliage infection was moderate and fairly general but the yield and quality were not affected. No blight occurred in the fall crop for the first time in 4 years." (PDR 23:154). In West Virginia, J. G. Leach sent in a loss estimate of 5 percent. In North Carolina 3 percent loss was estimated. Texas, scattered distribution in eastern part of State. In Ohio, it was said that late blight only appeared in certain local areas, muck areas especially, estimated loss was 3 percent. R. E. Vaughan reported the disease general, but less prevalent than last year in Wisconsin. He estimated 3 percent reduction in yield plus 2 percent loss in quality. The disease "came on in about a week following a 3-day rain. Extensive epiphytotic was checked by drought and heat in September." In Minnesota, C. J. Eide reported that blight was observed mostly on peat where fogs were heavy -- estimated loss was 2 percent. Iowa and Washington each estimated a trace loss.

Pythium aphanidermatum, leak, was reported by J. T. Middleton in Riverside County, California. It caused slight loss owing to high temperature of storage bin.

Sclerotinia sclerotiorum, sclerotinia rot, in the Hastings section of Florida was reported by A. H. Eddins in a few fields. The rainfall and temperatures were unfavorable for the disease.

Sclerotium rolfsii, southern wilt, according to A. H. Eddins was less prevalent than last year owing to the dry season -- estimated loss 0.5 percent. Louisiana reported a trace loss. Oklahoma estimated

1 percent loss.

Spondylocladium atrovirens, silver scurf, was common in all counties in Pennsylvania, but losses were negligible (O.D.Burke). Washington, in Benton County.

Synchytrium endobioticum, wart. The potato wart eradication program in Pennsylvania is described by T.P. Dykstra in the Reporter (23:7-8).

Virus diseases: Report on potato virus diseases in 1939 is given by T. P. Dykstra in the Amer. Potato Jour. 17:201-210. August 1940. Calico was reported in New York, Texas (PDR 24:41-43), and California. Curly top occurred in Whitman County, Washington. O. D. Burke reported giant hill caused a trace loss in Pennsylvania. "Especial care was taken to rogue for this disease in seed areas to prevent occurrence in 1940." Leaf roll was reported less to much less prevalent than last year in most States reporting. Net necrosis was unusually prevalent in Green Mountain seed potatoes shipped into Long Island from Maine during December (PDR 24:156). Washington (Phytopath. 30: 787. Sept. 1940). In Vermont, H. L. Bailey reported, "Though leaf roll was somewhat more prevalent than last year, in inspection counts, the increase was not enough to make substantial change in crop loss." A reduction of 5 percent in yield was estimated. The most susceptible varieties were Green Mountain, Cobbler, and Early Rose. Maine, Massachusetts, and Oklahoma each estimated 3 percent loss. (PDR 23:343). In New York, K. H. Fernow reported, "About 1500 acres on Long Island planted with one source of Maine Green Mountains showed 60 to 97 percent leaf roll as well as a very poor stand." Estimated loss was given as 1.5 percent (PDR 23:219). According to the State Department of Plant Pathology the disease was general in central New Jersey. O. D. Burke in Pennsylvania reported leaf roll less prevalent than last year. Considerable education attempted to influence farmers to use certified seed", estimated reduction in yield was 2 percent. Maryland and Washington also estimated 2 percent loss. Virginia, North Carolina, and Florida, each estimated 1 percent loss. J. G. Leach in West Virginia sent in an estimate of 5 percent loss. In the Hastings section of Florida, A. H. Eddins reported the disease much less prevalent than last year. Spaulding Rose was the most susceptible variety. P. A. Young reported 5 percent loss in Hidalgo and Cameron Counties, Texas. Ohio, usual prevalence, 4 percent loss. The highest estimated loss was 7 percent in Iowa. States reporting less than 1 percent were Texas, Michigan, Wisconsin, North Dakota, and Idaho. In California, Middleton reported its occurrence in Riverside County. Spindling sprout or hair sprout (non-parasitic, except where it follows leaf roll). Hair sprout in New York in some cases at least was connected with leaf roll (PDR 23:219). In Dade County, Florida, G. D. Ruehle reported, "Fields planted to western seed were practically free of the trouble in 1939. Spindling sprout accompanying leaf roll was present in a few fields." (PDR 23:206). In the Hastings section, A. H. Eddins said that the maximum hair sprout damage occurred in fields planted with uncertified White Rose stock from Minnesota. Only a trace loss was estimated. J. H. Muncie in Michigan reported virus as the cause and a trace loss. Usual prevalence in Wisconsin. O. H. Elmer reported practically none noted in 1939 in Kansas. Mild mosaic was reported in about the usual amounts in Vermont, New York, Oklahoma, Wisconsin, and North Dakota. No particular comments were made in reporting common mosaic. Losses have been reported in Crop Losses (Supplement 127). Rugose mosaic caused slight losses. Its occurrence was reported in New York, Florida, Oklahoma, Washington, and California. Spindle tuber according to O. C. Boyd caused 1.5 percent loss in Massachusetts (PDR 23:343). Generally distributed in New Jersey. Maryland and Florida each estimated 0.5 percent loss. Oklahoma. In Indiana, R. W. Samson reported, "Survey of muck potatoes in July and August indicated that this disease was generally prevalent in very small amounts. No damage to speak of except in stocks grown 6 years from certified seed." In Michigan spindle tuber was common in Chippewa and Katahdin-- a trace loss was estimated. Wisconsin, 3 percent loss. Kansas, 2 percent loss. G. H. Starr reported 0.4 percent loss in Wyoming. "Probably considerable spread by grasshoppers which were abundant in most parts." Yellow dwarf: In Vermont, H. L. Bailey reported only a slight trace of yellow dwarf was noted except in a small field of Early Rose and a large field, 3 to 4 acres, on the same farm in Rutland County, where infection probably averaged 2 percent. In New York, E. D. Hansing reported that low rainfall in western New York will probably result in greater prevalence in 1940. Field observations also indicated this. A trace loss was reported in Pennsylvania, Maryland, Ohio, Indiana, and Michigan. In Indiana, the worst case was noted in uncertified seed from Michigan. R. E. Vaughan reported local distribution in Wisconsin. "The limits of distribution are spreading slowly. New seed continues to be most important." In Minnesota, C. J. Eide reported yellow dwarf very common in the vicinity of Cambridge due to poor seed.

Hopperburn (caused by leafhoppers) and tipburn (non-parasitic). Tipburn caused by drought was reported from Connecticut. In Vermont, H. L. Bailey said, "If premature dying of foliage due to heat and drought were counted as tipburn, loss would run to 20 percent, but insect damage, hopperburn, and blight made it impossible to differentiate definitely." O. C. Boyd in Massachusetts estimated 2 percent loss, which is less than last year. In New York, K. H. Fernow reported 10 percent reduction in yield with the comment: "Much damage in Long Island and upstate from dry weather, often difficult to differentiate. Mineral deficiencies may be involved also." O. D. Burke reported tipburn present wherever potatoes are grown in Pennsylvania. Estimated loss 1 percent. Maryland and North Carolina also estimated 1 percent loss. In West Virginia, J. G. Leach reported 5 percent loss. Other percentage losses were: Minnesota, 10; Iowa, 8; Ohio, 7; Indiana, 4; Michigan, 3; Wisconsin, 2; North Dakota, 0.5 and Texas, a trace.

Psyllid yellows (induced by the potato psyllid). Low yields of potatoes in Montana in 1939 were not generally traceable to psyllid infestations (PDR 24:173). In Wyoming, G. H. Starr reported the disease much less prevalent than in 1938. "Heaviest pyllid infestation seen this season was at Laramie where loss was about 25 percent (from a comparison of sprayed with non-sprayed). Total estimated loss for State was 12 percent. J. G. Brown in Arizona reported considerable damage caused in the Duncan district, since spraying started too late. Estimated loss for State was 30 percent.

Purple top wilt (cause undetermined) caused a trace loss in New York according to K. H. Fernow. He thinks the disease may have been present many years but attributed to Rhizoctonia (PDR 23:281). In Pennsylvania, O. D. Burke reported purple top very common and becoming one of the disease problems of prime importance to potato growers. Estimated loss 2 percent. In West Virginia, J. G. Leach estimated 4 percent loss. K. S. Chester reported its occurrence in Choctaw County, Oklahoma. In reporting from Michigan, J. H. Muncie said that as far as he had been able to find, the purple top wilt disease is identical with one which they have known in Michigan since 1915 as moron. It has been kept at a minimum by consistent regueing (PDR 24:7). Maine, Minnesota, and North Dakota each reported a trace.

Seed piece decay (various organisms) was reported from 12 States. The highest loss, 5 percent, was estimated for Delaware and Montana. All other States estimated 1 percent except Florida, Idaho, and Washington, where a trace was reported.

Drought and heat injury caused heavy losses in some States. For estimates see Crop Losses (Suppl. 127).

SPINACH. See SPINACIA OLERACEA.

SPINACIA OLERACEA. SPINACH:

Albugo occidentalis, white rust. Texas.

Colletotrichum spinaciae, anthracnose. Texas.

Fusarium sp., wilt. In Nassau County, New York (on Long Island), C. S. Cannon reported wilt very destructive, causing 100 percent loss of the summer crop in the Valley Stream section where spinach is grown year after year. (PDR 23:262). Crown rot in Maryland caused the usual loss, 5 percent. In Virginia, Harold T. Cook reported, "The importance of this disease appears to be increasing each year. The damage caused by it occurs, however, only in the early fall plantings. It is especially severe in fields in which spinach has been allowed to go to seed." Estimated reduction in yield was set at 3 percent. F. spinaciae occurred throughout southwestern Texas causing a trace loss according to S. S. Ivanoff.

Heterosporium variabile, leaf spot. Texas, scattered distribution.

Peronospora effusa, downy mildew, was less prevalent than in 1938, in Massachusetts, owing to the unusually dry weather even during September. In Nassau County, New York, O. S. Cannon reported the disease found only in a few fields of overwintered spinach. In New Jersey the disease was reported severe in two fields. Maryland reported the usual prevalence 1 percent loss. In Virginia, Harold T. Cook reported the disease was present during most of the spring months, but no epidemics developed. Owing to the dry weather it did not develop until early November in the fall crop. It caused serious damage on only one farm but was scattered on others during the fall. Southwest Texas, 10 percent infection. Washington, in Pierce County. John T. Middleton reported the disease more prevalent in southern California, loss in quality was estimated at 40 percent.

Damping off caused by Pythium irregulare, and P. ultimum was more prevalent than last year in Riverside County, California, according to John T. Middleton.

Mosaic (cucumber virus). In New York, "almost none reported this season. Resistant varieties planted mostly for fall crop." (Charles Chupp). Maryland estimated 3 percent loss, usual prevalence.

SQUASH. See CUCURBITA spp.
SWEETPOTATO. See IPOMOEA BATATAS.
TOMATO. See LYCOPERSICON ESCULENTUM.

TRAGOPOGON PORRIFOLIUS. SALSIFY:

Albugo tragopogonis, white rust. According to Charles Chupp almost none was reported this season in New York. Wisconsin reported less owing to the dry weather. Washington, in Whitman County.

Erysiphe cichoracearum, powdery mildew, in New York was reported less prevalent than for several previous years, according to M. B. Linn -- estimated loss, a trace.

Sporidesmium scorzonerae, leaf blight, in New York on Staten Island. According to M. B. Linn, this disease may ordinarily be found in every planting, but this year there was considerably less in amount than in any year since 1934.

TURNIP. See BRASSICA RAPA.

WATERMELON. See CITRULLUS VULGARIS.

D I S E A S E S   O F   F R U I T   C R O P S

Fruit diseases on the Chicago market in 1939 were reported by G. B. Ramsey in the Plant Disease Reporter 24:405-413, 1940.

(AMYGDALUS PERSICA) PEACH. PRUNUS PERSICA:

Armillaria mellea, root rot, was reported on peach from Illinois to the Survey for the first time. According to H. W. Anderson it occurred on scattered trees in an 80-acre planting.

Cladosporium carpophilum, scab, was reported as follows: In Massachusetts small amounts of scab developed in commercial peach orchards (PDR 23:343). It was much less prevalent than last year; New York, in Ulster County, according to C. G. Small scab was found on twigs of nursery stock received by one grower, the disease practically covered the entire surface of many of the twigs; New Jersey, "Generally distributed, many fruits were speckled and knotted"; in Maryland according to E. A. Walker the disease was most prevalent in poorly sprayed orchards -- total loss was estimated at 3 percent (PDR 23:152); Virginia, less prevalent than for several previous years (PDR 24:44-48); Tennessee and Indiana (PDR 23:152); Texas, in 24 eastern counties; Oklahoma, in Delaware County; in Ohio, H. C. Young reported an estimate of 2 percent loss; in Illinois, H. W. Anderson reported the disease much more prevalent than last year, "Data from 27 orchards show that 54.6 percent of trees and 17.5 percent of all the fruit was infected." He estimated the total loss at 1 percent; Michigan reported the disease rather severe on some unsprayed trees; more prevalent in Iowa than last year, estimated loss according to G. C. Kent was 2 percent; D. G. Milbrath reported scab in Ventura County, California.

Coryneum beijerinckii, blight. Oklahoma, in Payne County, according to K. S. Chester; Michigan and Idaho reported the disease less prevalent, total loss a trace (PDR 24:178); in California, E. E. Wilson reported California blight much less than last year. A few orchards were noted with a considerable amount. "Control of this disease continues to be one spray of bordeaux applied in autumn (November 15 to December 1), after leaves have fallen. The spray protects the twigs from infection"; Washington, in Snohomish County.

Fusarium avenaceum, pink rot, was reported from Bond County, Illinois by H. W. Anderson. The disease was found in only one orchard. This is the first report of this disease on peach in the United States according to the Survey files.

Heterodera marioni, root knot, was reported very prevalent in southeast Texas; Oklahoma, in Greer County; in Kansas, J. O. Miller reported nematodes (probably H. marioni) destroyed a 2-acre orchard in Sedgwick County. This appears to be the first report on peach in Kansas.

Phoma persicae, stem canker. K. J. Kadow reported that two peach orchards in Delaware had a rather large infection of this disease on twigs and branches (PDR 23:189).

Phymatotrichum omnivorum, root rot. Texas, in Brazos, Mills, and Val Verde Counties.

Phytomonas pruni, bacterial spot, was reported generally less prevalent this year than in most years. Massachusetts reported much less, owing to the dry weather in July and August (PDR 23:343); New York; Maryland reported less than last year, estimated total loss 1.5 percent; in Virginia, R. H. Hurt reported much less owing to the dry weather during May; in Cherokee County, Texas, P. A. Young reported severe damage to top leaves of a 1-year old peach orchard. It was also reported from Smith, Henderson, and Bell Counties; Oklahoma, in Cherokee, Le Flore and Pittsburg Counties; Arkansas was the only State reporting the disease much more prevalent than last year or for several previous years. The rain in May favored the rapid spread of the organism, according to J. C. Dunegan. In the northwest part of the State the disease was prevalent on the leaves -- there was no fruit owing to the spring frost (PDR 24:79-84); H. C. Young in Ohio reported an estimated loss of 0.5 percent; in Illinois, H. W. Anderson reported "Maximum infection in any one orchard 100 percent of trees and 52.2 percent of fruit infected, and 5.3 percent of leaf area destroyed. Data from 34 orchards showed an average prevalence of 64.7 percent of trees, 12.8 percent of fruit diseased, and 1.3 percent of leaf area destroyed" (PDR 23:190); in Michigan, Donald Cation reported the disease was seen in scattered orchards, and was less than last year in orchards which had been observed 2 years in succession; Iowa and Nebraska reported its presence; it was present in Kansas but not common, according to O. H. Elmer.

Phytomonas tumefaciens, crown gall. Texas, 1 report from Van Zandt County; Oklahoma in Murray County; J. G. Brown reporting from Arizona said "Less prevalent than 10 years ago, probably due to more careful inspection of imported nursery stock. Almost invariably fatal, due to ease with which balance between water intake and transpiration is upset in a dry climate."

Podosphaera spp., powdery mildew, of peach is becoming of considerable importance in Idaho. It was noted in several new orchards this year and was much more serious than usual (PDR 24:178).

Rhizopus nigricans, soft rot, in Illinois was more prevalent than last year, as reported by H. W. Anderson. "In 5 orchards totaling 4525 trees, an average of 7.7 percent of trees and 0.05 percent of fruit was infected"; Idaho reported rot general but in one orchard near Caldwell loss was minimized greatly by a program of sanitation and disinfection of boxes and equipment (PDR 24:179).

Sclerotinia fructicola, brown rot, was reported from 20 States. In Massachusetts, O. C. Boyd reported the disease much less prevalent than last year owing to the dry weather during July and August -- estimated loss was 0.5 percent (PDR 23:343); New York also reported it less prevalent, early peaches in Niagara County showed some injury, according to J. G. Goodrich; New Jersey, "Many blossoms blighted during first week in May, in Atlantic and Gloucester Counties"; in Delaware, according to K. J. Kadow, from 1 to 5 percent of blossom blight was caused by this fungus, but in no case was the yield affected by the disease (PDR 23:152), later 1 percent loss was estimated; in Maryland, E. A. Walker estimated the same loss as last year, 3.5 percent; R. H. Hurt in Virginia reported orchards in Piedmont Virginia were sprayed with sulfur and the disease was much less prevalent than last year -- he estimated the loss in that section as 2 percent (PDR 24:44-48); the loss in Northern Virginia was 6 percent and for the State as a whole averaged 3.5 percent according to S. A. Wingard; C. F. Taylor in West Virginia estimated 1 percent loss; the disease was well distributed throughout southeastern Texas--only a trace loss was estimated; Oklahoma estimated 5 percent loss; in northwest Arkansas the fungus was observed during the latter part of March on the early maturing peach varieties. No further observations were made as the freeze of April 6 eliminated the peach crop in this section (PDR 24: 79-84); H. C. Young in Ohio estimated a total loss of 5 percent which is the same as last year; in Indiana, R. C. Baines reported 2 percent loss, which is more than for several previous years; H. W. Anderson in Illinois reported 3 percent loss. "Data taken from 75 orchards showed 63.1 percent of trees, 1.9 percent of fruit, and 0.3 percent of twigs were infected"; in Michigan, Cation reported that he saw blossom blight on the Prolific and Rochester varieties -- estimated loss in quality was 5 percent; in Iowa, G. C. Kent reported the disease more prevalent than for several years -- 8 percent loss was estimated; according to M. A. Smith in Missouri, blossom blight was present and the disease was later observed on the fruit. The susceptible varieties were Elberta and Mikado; occurrence of the disease was noted in Kansas and Nebraska; Sclerotinia spp., were reported by the State Department of Plant Pathology from Washington in Clark and Buckley Counties.

Sphaerotheca pannosa, powdery mildew, was observed in Yates County, New York; Maryland; Iowa and Idaho each reported a trace loss; Washington in Pierce and Yakima Counties -- estimated loss 0.4 percent.

Taphrina deformans, leaf curl, was reported generally less prevalent than during 1938. The 7 States reporting a trace loss were Massachusetts, New York, West Virginia, Texas, Illinois, Michigan, and Idaho (PDR 23:254-258); in New Jersey leaf curl was reported by the State Plant Pathology Department as prevalent and severe throughout South Jersey; in Delaware, K. J. Kadow reported that this was one of the worst leaf curl years for some time (PDR 23:189). Estimated loss was 5 percent; Maryland reported 3 percent loss; in northern Virginia, A. B. Groves estimated a loss of 1 percent (PDR 24:44-48); C. F. Taylor in West Virginia reported this disease was well controlled in most commercial peach orchards; Oklahoma, 1 percent loss; no serious outbreak of the disease was encountered in Arkansas; Ohio and Indiana each reported 1 percent loss; Illinois (PDR 23:152, 189); Iowa reported a total loss of 3 percent; leaf curl in Missouri was observed only in a few scattered orchards, less prevalent than in 1937 or 1938; Nebraska "none reported"; occurrence noted in Kansas; in Idaho leaf curl was of no consequence (PDR 24:179) this year; Washington, in Whatcom, Snohomish, King, Pierce, and Kitsap Counties; E. E. Wilson in California reported leaf curl much less prevalent than in 1938. He stated that the general practice is to control both peach blight and leaf curl with one autumn application of bordeaux. "Lack of rainfall when leaves appeared probably accounted for lack of disease, also temperature appeared favorable, inasmuch as it was moderate at critical period." The susceptible varieties were Gaum, Paloro, and Peak.

Tranzschelia pruni-spinosae discolor, rust, in Florida was reported more prevalent than for several previous years, "Present every year in Experiment Station plots, but very severe this fall"; in northwest Arkansas, John C. Dunegan reported that very few pustules were found in 1939 -- and these were only uredia; H. W. Anderson reported from Illinois that none was observed in commercial orchards, but it was present in nurseries. Some was found at Olney in hybrid selections of commercial varieties. No loss was reported; Texas, in Montgomery County; in California, H. Earl Thomas reported that the disease, in general, was very mild, but built up late in season around San Francisco Bay (Santa Clara County) on peach and prune.

Valsa spp., canker, was reported from 7 counties in New York. In Wayne County the disease was found to be practically killing by girdling one block of peaches; cankers caused by V. leucostoma and V. cincta have been found in considerable quantity in peach orchards in Erie County, Pennsylvania, according to H. W. Rankin; K. S. Chester reported dieback in Delaware County, Oklahoma. This had not been recorded previously in the Survey files, but probably occurred; Michigan, estimated loss 1 percent.

Verticillium albo-atrum, wilt. New York in Niagara County.

Virus diseases: Bumpy peach was reported by Valleau in Kentucky (PDR 23:282). Leaf-casting yellows was reported by H. Earl Thomas from California, in Solano, Contra Costa, and Placer Counties. Little peach was observed in New York and Maryland. Mosaic, Oklahoma, in Bryan County; Arizona reported 25 percent loss from mosaic. Phony peach in Georgia was reported causing a 5 percent loss, and in Oklahoma a trace loss; in Illinois, H. W. Anderson reported "Two suspicious trees observed." Red suture disease of peach was reported from Maryland for the first time on Belle of Georgia and Elberta trees by E. A. Walker (PDR 23:254). This disease of peach has heretofore been reported only from Michigan. Rosette:

In Arkansas "Six abandoned peach trees - 3 in each location -- were found affected with rosette in 1939. The trees were destroyed by the State Plant Board." (PDR 24:79-84). H. W. Anderson reported "Two trees in home planting" in Madison County, Illinois. In Michigan, Cation said he saw the disease in 4 orchards in Berrien County. Yellow-red virosis (X-disease): Massachusetts, in general, according to O. C. Boyd the disease was definitely more prevalent on both peach and chokecherry in the southern half of the State, except for the 3 southeastern counties, than in the northern half. The survey in Bristol County was not at all comprehensive but he failed to see the disease on either chokecherry or peach in the area from Dighton to Westport and Dartmouth. No survey was made in Plymouth and Barnstable Counties. Neither were there received any reports of suspected cases from those areas. "It is felt that this disease already is far more damaging to the peach industry of the State than any other one or two diseases. Furthermore, indications point to even greater possibilities for losses in the future because it is not yet distributed throughout all sections of the State on either the chokecherry or the peach" (PDR 23:259, 341-342; 24:74-78); Connecticut (PDR 23:386); reported from Rhode Island for the first time. (Fifty-second Annual Report. R. I. State College of Agr. Exp. Sta. Contrib. 574. 1940); the disease was reported in New York in Rensselaer, Columbia, Dutchess and Niagara Counties (PDR 24:44-48). In Idaho, Earl C. Blodgett reported a disease resembling X-disease of peach (PDR 23:216-218; 24:181); apparently same as disease reported in 1937 (PDR 21:89,95). Yellows: Peach yellows is present as usual in some orchards in Massachusetts, totally absent in others (PDR 23:259). Other States reporting were New York, New Jersey, Maryland, Virginia, Illinois, and Michigan. There seems to be no active spread of the disease in any of these States. Angular yellow spot, which is distinct from peach mosaic and not definitely proven to be a virus disease, was reported from Oklahoma (PDR 24:74-78).

Diseases of non-parasitic and undetermined origin: Calico (undet.). Leaves on one branch of a peach tree at Caldwell, Idaho showed a brilliant yellow variegation suggesting the name calico (PDR 24:181). Leaf spotting and defoliation (undet.) was severe in certain orchards in Idaho again this year (PDR 24:181). Spray injury: In Massachusetts, arsenical injury was not so pronounced as usual (PDR 23:343); in Ulster County, C. G. Small reported that he saw one peach orchard in which all fruit-buds were dead, apparently due to spraying with 1-9 lime sulfur late in March. The grower covered the orchard thoroughly and then sprayed it over the same day. Injury was also reported from 8 other counties in the State; arsenical injury was reported in Arkansas by John C. Dunegan (PDR 24:79-84). Silvering of foliage was reported in Idaho. Growers considered high temperatures to be the cause (PDR 24:182). Stipple spot (undet.) was reported by K. S. Chester in Oklahoma. (PDR 24:74-78). Yellow vein (undet.), Washington, in Okanogan County. Split pit and fruit gumming (non-par.), Washington in Stevens, Benton and Pierce Counties. Wart (undet.) was reported for the first time to the Survey from Idaho. Its prevalence has increased. So far nothing is known regarding the nature of the cause (PDR 24:181). Yellow spotting of leaves (undet.), Idaho (PDR 24:182).

Weather injuries: Frost injury caused a trace loss in New York. From nothing to 80 percent damage was done by frost in Delaware. The greatest losses occurred in Sussex County (PDR 23:152). Virginia reported a loss of 40 percent. Arkansas (PDR 24:79). In Idaho late spring frosts destroyed most of the peaches in scattered orchards and may have been partly responsible for a "second crop" condition (PDR 24:180). Washington reported 2 percent loss. Winter injury: Considerable evidence of winter injury occurred in Columbia County, New York, according to S. R. Shapley; Delaware, Georgia, and Washington each reported 2 percent loss and Virginia, 1 percent. Drought injury caused an estimated loss of 15 percent in Delaware.

APPLE. See MALUS SYLVESTRIS.
APRICOT. See PRUNUS ARMENIACA.
BLACKBERRY. See RUBUS Spp., BLACKBERRY.

CARICA PAPAYA. PAPAYA:

Asperisporium caricae, leaf spot. Florida in Brevard, Polk, Manatee Martin, Palm Beach, Broward, and Dade Counties (E. West).

Oidium caricae, powdery mildew, in Florida (PDR 23:130-133).

CHERRY. See PRUNUS Spp., CHERRY.

CITRUS Spp., CITRUS:

Capnodium sp., sooty mold, on C. sinensis in Texas and Arkansas.

Diplodia natalensis, stem-end rot, on C. limonia. Texas, in Hidalgo County, "Loss 0 to 15 percent."

Penicillium sp., blue and green mold, Texas, "5 to 10 percent loss in Dimmit County and throughout region."

Phytophthora sp., root rot, on C. grandis in Hidalgo, Texas -- trace loss. P. parasitica (?) was reported in Dimmit County, Texas, and throughout the region causing 1 percent loss.

Sphaceloma fawcettii, scab. Trace loss in Hidalgo County, Texas.

Nematodes caused damping-off of C. sinensis seedlings in Cameron County, Texas -- 10 to 25 percent loss in spots.

Chlorosis caused by mineral deficiency was reported on C. grandis and C. sinensis by G. H. Godfrey from Hidalgo and Cameron Counties, Texas.

Scaly bark (virus?). Texas, in Hidalgo County.

Skin breakdown was reported on Florida oranges that had received "color added" treatment (PDR 24:156).

Storage rot. During April 1939, an apparently undescribed fruit rot of grapefruit (R. B. Streets. Phytopath. 30: 787. Sept. 1940) occurred in Arizona grapefruit held in cold storage.

BLUEBERRY. See VACCINIUM CORYMBOSUM.
CRANBERRY. SEE VACCINIUM MACROCARPON.
CURRANT. See RIBES Spp. CURRANT.

CYDONIA OBLONGA. QUINCE:

Erwinia amylovora, blight, was reported in New York, in Dutchess, Niagara and Orleans Counties, by W. D. Mills. He estimated only a trace loss. Blight was general throughout central Ohio, according to E. W. Mendenhall.

Fabraea maculata, leaf blight. New York, in Wayne and Orleans Counties. In Arkansas, John C. Dunegan reported that typical specimens of this disease were received from a grower during the last week of June. The injured leaves were from non-sprayed trees, and it was stated that the trees were practically defoliated by the attack of the fungus (PDR 24: 84).

Gymnosporangium clavipes, rust. New York, in Orleans County.

DEWBERRY. See RUBUS Spp. DEWBERRY.

ERIOBOTRYA JAPONICA. LOQUAT:

Fusicladium eriobotryae, scab. Washington, in Snohomish County.

FICUS CARICA. FIG:

Corticium microsclerotia, leaf blight, in Louisiana was said by E. C. Tims to be much more prevalent than for several previous years owing to the warm moist weather. It was reported from 5 parishes. C. stevensii, thread blight. Louisiana, in St. James Parish. Phymatotrichum omnivorum, root rot. Texas, Bell and Dimmit Counties, each reported 5 percent loss. Physopella fici, rust. Louisiana, in E. Baton Rouge Parish. Texas, in Hidalgo and Lavaca Counties. Tubercularia fici, limb canker. Texas, in Orange County. Sunscorch (non-parasitic) Texas.

FIG. See FICUS CARICA.

FRAGARIA Sp., STRAWBERRY:

Aphelenchoides fragariae, dwarf or crimps. In Massachusetts, O. C. Boyd reported the disease was more widespread and damaging this year on the Cape than in any past year on record. Losses ranged from trace to 60 percent for fields on Cape Cod with a probable average there of 5 percent. (PDR 23:237); in Maryland, W. F. Jeffers estimated a trace loss;

the usual prevalence was reported in Virginia by Harold T. Cook, who estimated a loss of 5 percent; A. G. Plakidas reported the disease from Louisiana in Tangipahoa, St. Helena, Livingston, Ascension, and East Baton Rouge Parishes; in Michigan, D. Cation reported the disease found in one field on plants obtained from Connecticut.

Batrytis cinerea, gray mold rot, in Massachusetts was reported much less prevalent than last year owing to the dry weather during June and July, according to O. C. Boyd, who estimated the total loss at 5 percent (PDR 23:236); Maryland, scattered distribution; V. H. Young, in Arkansas, said that the disease appeared less prevalent than usual. In Louisiana, A. G. Plakidas reported the disease in 4 parishes, with a 5 percent loss in quality.

Cercospora sp., leaf spot. Louisiana, in Tangipahoa, Livingston, and East Baton Rouge Parishes. Dendrophoma obscurans, angular leaf spot, affected occasional plants at Pleasanton and Winter Haven, Texas (PDR 24:43).

Diachea leucopoda (myxomycete). Paul R. Miller wrote that only one strawberry plant was observed with this trouble in a rather large planting near Jackson, Tennessee.

Diplocarpon earliana, leaf scorch, was reported from New Hampshire by S.Dunn. This is the first report from the State to the Survey; New York, local and very slight according to R. F.Suit; in Maryland, W. F. Jeffers estimated 1 percent loss; A. G. Plakidas in Louisiana estimated a reduction in yield of 3 percent; Oklahoma, in Payne County; in Arkansas the disease appeared to cause little loss according to V. H. Young; less prevalent than last year in Wisconsin, estimated loss 0.5 percent.

Ditylenchus dipsaci, stem nematode. A survey of strawberry fields in the Columbia River Valley of Washington and Walla Walla River Valley of Oregon showed many commercial fields heavily infested with this nematode (PDR 23:208). Fusarium orthoceras longius et al., root rot complex. Maryland, 3 percent loss was reported by W. F. Jeffers. Heterodera marioni, root knot nematode. Maryland, usual prevalence, trace loss; Texas, in Atascosa County; Oklahoma in Tulsa County.

Mycosphaerella fragariae, leaf spot, was reported as follows: In Massachusetts, O. C. Boyd reported the disease much less prevalent than in 1938, owing to the dry season; in New York, it was general but damage slight; New Jersey; Maryland, scattered distribution, estimated total loss 2 percent, most resistant varieties were Dorsett and Fairfax; Louisiana, "Early winter was mild, allowing good vegetative growth of host. Infection started early." (A.G.Plakidas); Texas experienced a loss of 2 percent in Dimmit County; in Arkansas, V. H. Young reported "Very little present"; Ohio, usual prevalence, estimated loss 0.2 percent; a 2 percent loss was estimated in Indiana; Michigan, average prevalence, trace loss; Minnesota, more prevalent than in 1938 or in an average year, estimated loss 5 percent; Iowa, general distribution, estimated total loss 3 percent; Nebraska; Kansas, "Much loss in southeast and Kaw Valley"; Idaho, less prevalent than last year or in an average year (PDR 24:179); Washington, in Stevens, Clallam, Grays Harbor, and Lewis Counties.

Pezizella lythri, tan rot, was less prevalent in Louisiana than last year, when 15 percent loss was estimated.

Phytophthora sp., red stele root rot, was reported from 12 States. The highest loss was 15 percent in Maryland. Delaware came next with a loss of 10 percent (PDR 23:191). Virginia estimated 3 percent loss, still confined to the northern end of Accomac County (Harold T. Cook). Illinois estimated 1 percent loss; Massachusetts, 0.5 percent; Iowa, 0.1 percent; New York, Michigan, Wisconsin, and Oregon, each, a trace. In New Jersey the disease was found in Cumberland, Mercer, Morris, Monmouth, and Middlesex Counties. "Portions of strawberry beds that were found infected with red stele are now entirely dead; a planting made last year from an infected field of Premier and Aberdeen in the Matawan area definitely disclosed the resistant qualities of Aberdeen. Some Premier plants died, some became wilted and stunted, whereas the Aberdeen plants remained vigorous and healthy. Some of the Experiment Station seedlings, planted in soil infected with the red stele organism in 3 different parts of the State, showed resistance to the disease." (E. Clark). W. D. Valleau reported red stele in Johnson County, Kentucky (PDR 23:153). See also Plant Disease Reporter 24:185 ("Red stele root rot of strawberry" by C. E. Temple).

Phytophthora cactorum, leather rot, was reported by A. G. Plakidas in Louisiana as being less prevalent than in 1938. Rhizopus nigricans, fruit rot, was common in market berries in Oklahoma. R. C. Baines in Indiana reported 1 percent reduction in yield plus 1 percent loss in quality. Kansas, as prevalent as last year, but less than in an average year. This rot was very serious on Mastodon strawberries near Boise, Idaho. Sclerotinia sclerotiorum, crown rot, in Iowa caused a trace loss.

Sphaerotheca humuli, powdery mildew. New York and New Jersey. In Idaho infection was noted in plantings at Kooskia in June. It has been reported that mildew has eliminated strawberry growing in some localities in north central Idaho (PDR 24:178). Harold Thomas in California reported "Much less than for 2 previous years. Severe in 1938 along coast. None in interior valleys."

Verticillium spp., wilt, in California, according to Harold E. Thomas was "Severe along coast where tomato or potato land was used for strawberries." The most susceptible varieties were Nich Ohmer, Dorsett, and Redheart.

Leaf variegation or Blakemore yellows (cause undetermined, probably genetic). Maryland, "Less yellows in 1939 due to more general use of the improved Blakemore variety" (W.F.Jeffers). A trace loss was estimated.

Other States reporting a trace were Vermont, New York, Oklahoma, Michigan, Montana, and Idaho. Delaware and Illinois reported 1 percent; Virginia, 3; and Arkansas, 5. Texas (PDR 24:41-43). The trouble was present in some localities in Minnesota but was not an important disease according to E. G. Sharvelle. Kansas, "On variety Blakemore and certain others, seemingly including those whose parentage is Howard" (O.H.Elmer).

Black root and root rots (undetermined) were reported from 17 States with the following percentage losses: Arizona, 15; Massachusetts, 11; Pennsylvania and Michigan, 10; Wisconsin, Minnesota, and Montana, 5; Maine, Maryland, Virginia, Oklahoma, Washington, and Oregon, 3; Delaware and Texas, 2; New York and Illinois, a trace.

Virus diseases: Crinkle was reported from Washington in Stevens and Spokane Counties. Mosaic caused a trace loss in Wisconsin. Witches' broom was recorded in Idaho for the first time (PDR 24:181). Yellows was much more prevalent in California than for several previous years, according to Harold Thomas.

Weather injury: Drought and heat injury was reported from the following States with losses as indicated: Massachusetts, New York, and Delaware, each 10 percent; Vermont, 5 percent; Arkansas and Oregon, each 4 percent. Drought in mid-summer in Arkansas almost completely destroyed many plantings. Yields were much reduced and much replanting was necessary in the northwest part of the State. Winter injury caused an estimated loss of 5 percent in Maine; a trace in Vermont and Illinois; 2 percent in Massachusetts, New York, and Arkansas; 15 percent in Michigan and 3 percent in Washington.

GAYLUSSACIA Spp., HUCKLEBERRY:

Heterodera marioni, root knot nematode, Oklahoma in Logan County. Pucciniastrum goeppertianum, rust. Washington, in Thurston County. Chlorosis (non-parasitic). Washington.

GOOSEBERRY. See RIBES GROSSULARIA.
GRAPE. See VITIS Spp.
HUCKLEBERRY. See GAYLUSSACIA Spp.

MALUS SYLVESTRIS. APPLE:

Erwinia amylovora, blight, was reported by 28 States. Many of them reported the disease less prevalent than last year. Losses were given as follows: A trace in Vermont, New York, Montana, and Idaho; less than 1 percent in Maine, Massachusetts, Virginia, West Virginia, Ohio, Indiana, Missouri, and Washington; 1 percent in Illinois; 1.6 percent in Maryland; 2 percent in Delaware, Georgia, Pennsylvania, Michigan, Wisconsin, Minnesota, North Dakota, Wyoming, and Arizona; 3 percent in Texas and Iowa; loss estimates were not given for New Jersey, Oklahoma, Nebraska, and Kansas.

Gloeodes pomigena, sooty blotch, was much less prevalent in New York than during 1938, according to W. D. Mills. In New Jersey the disease was common where late spray applications were omitted. A. B. Groves in northern Virginia reported sooty blotch more prevalent than usual as a result of the frequent summer rains and the abbreviated fungicide schedules of most growers in recent years. (PDR 24:44-48). C. F. Taylor wrote that the disease was severe in neglected orchards in West Virginia, estimated total loss was 2 percent. In Illinois, H. W. Anderson reported the disease more prevalent than last year, "Average in 10 orchards examined, 98.8 percent of the trees infected and 14.9 percent of the fruit." The disease was mostly in the southern part of the State. R. C. Baines in Indiana estimated 2 percent loss in quality.

(Gloeosporium perennans): See Neofabraea perennans.

Glomerella cingulata, bitter rot, was reported from 18 States. Georgia reported a loss of 5 percent; Maine, Delaware, and Virginia, each reported 3 percent; in Northern Virginia the increase in bitter rot noted during 1938 continued with an increase in outbreak. Many Grimes plantings were reported a total loss from the disease and many plantings of Jonathan, Golden Delicious, Delicious as well as other varieties were more or less severely affected (PDR 24:44-48). Maryland, Oklahoma, and Illinois, each reported 1 percent loss. H. W. Anderson in Illinois reported, "Data from 21 orchards (7 of which had no bitter rot) showed 15 percent of the trees infected and 0.3 percent of the fruit infected with rot." G. H. Boewe reported bitter rot as epidemic in southern Illinois in 1939 (PDR 23:294). This was the worst outbreak of the disease in the State since 1926 and 1927, when the greatest damage occurred in western Illinois. Other States reporting less than 1 percent loss were Massachusetts, New York, Pennsylvania, West Virginia, Ohio, Indiana, Iowa, and Missouri. Kentucky reported bitter rot on King David and Golden Delicious near Princeton -- it was also severe in other parts of the State (PDR 23:282). The disease was prevalent throughout New Jersey, but the losses were slight. Wisconsin reported its presence but no loss.

Gymnosporangium clavipes, quince rust, in Massachusetts was more prevalent and damaging than was anticipated during July (PDR 23:343). W. D. Mills in New York reported "Traces on Delicious and McIntosh -- not reported on Cortland, on which it was serious in 1937. Trace in Orleans County found by J. M. Hamilton." (PDR 23:258). In Pennsylvania, according to R. S. Kirby, quince rust was much less prevalent than for several previous years. In New Jersey the disease caused heavy dropping of the fruit. A. B. Groves reported "The incidence of this disease has been much reduced in northern Virginia the past two years. A different situation prevails in southwest Virginia." Reported from Kentucky (PDR 23:282). Arkansas, no specimens of this disease on the Delicious apple were observed this season (PDR 24:79-84). In Illinois, H. W. Anderson reported "Average of orchard data showed 14.2 percent of trees and 0.07 percent of fruit infected." M. A. Smith in Missouri reported the disease not so prevalent this year as in 1938 or 1937, although conditions were favorable for early infection.

G. globosum, hawthorn rust, was observed in Orleans County, New York on McIntosh leaves. Interplanted Wealthy bore only apple rust (W.D.Mills). Missouri (PDR 24:48-49).

G. juniperi-virginianae, apple rust, in Massachusetts was more prevalent and damaging than was anticipated during July. (PDR 23:188, 343). Traces of apple rust were found throughout western New York this year with a few blocks fairly heavily attacked. The disease is a potential problem if setting of red cedar continues. Also reported from Long Island and 7 southeast counties (W.D.Mills). In New Jersey the State Department reported apple rust more abundant than usual, general throughout the State. R. S. Kirby in Pennsylvania reported, ".02 percent infected apples in unsprayed and partly sprayed orchards and .024 in completely sprayed orchards." Maryland, scattered distribution, estimated loss 2 percent. Johnson and Haskell reported apple rust in Washington, D. C. In northern Virginia, A. B. Groves remarked, "The principal infection was on foliage and came relatively late, after the first cover spray." R. H. Hurt reported the disease "not important in the Piedmont fruit section." (PDR 24:44). In West Virginia, C. F. Taylor reported Gymnosporangium sp. causing a trace loss in West Virginia. Apple rust was present in Osage County, according to K. S. Chester. John C. Dunegan in Arkansas reported the disease "Prevalent on fruit in certain localities where alternate host exists. Very prevalent on Early Red Bird apple nursery stock causing considerable loss to growers." (PDR 24:81). H. C. Young reported a total loss of 1 percent in Ohio. A trace loss was reported in Indiana. H. W. Anderson reported from Illinois, "Average prevalence in 26 orchards, 69.6 percent of trees infected, 0.15 percent of leaf area, and 1.94 percent of fruit. Found no rust in Jersey County." (PDR 23:189, 258). Michigan, usual prevalence, estimated loss a trace. According to R. E. Vaughan apple rust was less prevalent in Wisconsin than for several years owing to less extensive rains in May (PDR 23:189). E. G. Sharvelle reported scattered distribution in the southern fruit areas of Minnesota with a total loss of 3 percent. The most susceptible variety reported was Wealthy. Iowa, 1 percent loss. In Missouri, M. A. Smith reported apple rust less prevalent than for several previous years. (PDR 24:49). Kansas, in Riley County.

Helminthosporium papulosum, black pox, in Pennsylvania was reported by R. S. Kirby as being less prevalent than in 1938 -- "6 percent of apples in unsprayed orchards were infected, .16 percent in partly sprayed orchards and .05 percent in completely sprayed orchards."

Leptothyrium pomi, fly speck. New York "only one report", according to W. D. Mills. R. S. Kirby in Pennsylvania estimated 2 percent loss. "54.8 percent of apples in unsprayed orchards infected, 2.52 percent in partly sprayed orchards and .09 percent in completely sprayed orchards." The disease was more prevalent than last year or in an average year. In Maryland, E. A. Walker reported an estimated loss of 1.5 percent, "Most prevalent in unsprayed home orchards." In northern Virginia, A. B. Groves reported fly speck more prevalent than usual as a result of the frequent summer rains and abbreviated fungicide schedules. C. F. Taylor reported that fly speck was observed in neglected orchards in West Virginia. H. W. Anderson reported the disease found in only 2 orchards in Illinois. It occurred in Wisconsin, but was not a factor in commercial orchards.

Mycosphaerella pomi, fruit spot, was reported less prevalent this year in Massachusetts by O. C. Boyd. In the southeastern part of the State, high humidities occurred even though rainfall was light -- estimated loss 0.2 percent; New York, reported from 5 counties in the southern part of the State; New Jersey, abundant in some orchards; Pennsylvania, less prevalent than last year or for several previous years, "4.6 percent of apples in unsprayed orchards infected and .16 percent of apples in partly sprayed orchards infected", according to R. S. Kirby; Maryland reported Black Twig, the most susceptible variety, estimated loss for State, 0.5 percent; Virginia (PDR 24:46); West Virginia, severe in neglected orchards, estimated total loss 1 percent; Ohio, more prevalent than in 1938, estimated loss a trace.

Neofabraea malicorticis, northwestern anthracnose, was reported by O. C. Boyd from Plymouth County, Massachusetts. This apparently is the first report of the disease from Massachusetts (PDR 23:125-126); Washington, in Whatcom and Lewis Counties. N. perennans, perennial canker, was reported from Maine and Washington causing less than 1 percent loss; Idaho (PDR 24: 179).

Nummularia discreta, blister canker, was observed in 8 States. The highest estimate of loss was 1 percent in Iowa; the other States, Pennsylvania, Virginia, Texas, Illinois, Michigan, Wisconsin, and Missouri each reported slight losses.

Penicillium expansum, blue mold rot, was less prevalent this year in Massachusetts, according to O. C. Boyd; New York, usual prevalence in Essex County; New Jersey, "One severe case in storage was attributed to careless handling"; R. S. Kirby reported less in storage in Pennsylvania, estimated loss 0.5 percent; blue mold rot was common on apples in Idaho. Serious loss was found on stored immature Rome Beauty apples at Parma (PDR 24:179); Bratley and Wiant reported the disease affecting 20 percent of the apples in one car from Washington. In general, this decay was slightly less common than usual (PDR 24:154).

Phyllosticta solitaria, blotch, was reported by the New Jersey State Department of Plant Pathology as being very severe on Smith Cider in some orchards -- 85 percent of the fruit was affected. It was also observed on many other varieties. Losses amounting to a trace were reported from Vermont, New York, Delaware, Virginia (PDR 24:45), and Michigan. Indiana, Wisconsin, Missouri (PDR 24:48) and West Virginia, each estimated 0.1 percent loss; Ohio, 0.2 percent; Pennsylvania, 5.9 percent in unsprayed orchards; Iowa and Maryland, each, 0.5 percent; in Illinois, H. W. Anderson reported a total loss of 1.5 percent. "Data showed average prevalence 29.3 percent of trees infected, 5.5 percent of fruit, 0.08 percent of twigs and a trace of leaf area involved." (PDR 23:259); Oklahoma estimated 4 percent loss; in Arkansas, "More fruit infections were seen in 1939 than during past 5 seasons. The fungus is definitely becoming re-established (due to poor spraying) in orchards where drought had reduced it to minor importance." (PDR 24:79). Kansas reported that the disease was present.

Physalospora obtusa, black rot, in Massachusetts caused less damage than usual on both foliage and fruit, according to O. C. Boyd; severe defoliation in a Nassau County (New York) nursery -- also found in 7 other counties; New Jersey; R. S. Kirby estimated a total loss of 1.5 percent in Pennsylvania -- "2.9 percent infected fruit in unsprayed orchards"; black rot leaf infection was extremely bad on some varieties in Delaware. Williams was the outstanding one (PDR 23:190). Estimated loss 3 percent; Maryland, less prevalent than during 1938, estimated loss 1 percent; in northern Virginia black rot caused more trouble than usual owing to the frequent rains throughout the first 2 months of summer. Losses were scattered rather than general. (PDR 24:45); in West Virginia a trace was observed, mostly in neglected orchards; Illinois and Michigan also reported traces; Ohio, Wisconsin, and Missouri each reported 0.1 percent loss; Oklahoma, 1 percent and Iowa, 2.5 percent loss; chiefly leaf infection in Nebraska according to R. W. Goss -- less than in 1938; Kansas.

Phytomonas papulans, blister spot, in Pennsylvania was less prevalent than for several years, according to G. L. Zundel. In northern Virginia, A. B. Groves reported it more prevalent than usual as a result of the frequent summer rains and abbreviated fungicide schedules of most growers in recent years. P. rhizogenes, hairy root. Oklahoma. P. tumefaciens, crown gall, was of little economic importance this year -- its occurrence was observed in New York, New Jersey, Maryland, Wisconsin, Minnesota, and Kansas. In Minnesota, according to E. G. Sharvelle, it was reported from scattered localities, notably from a nursery.

Phytophthora cactorum, fruit rot, was less prevalent in Massachusett than in 1939. According to W. D. Mills, the disease was abundant in 1938, but there were no reports in 1939; R. C. Baines reported a trace loss in Indiana.

Podosphaera leucotricha, powdery mildew. New York, "Reported only in Chautauqua County, where it appears in varying amounts each year." In Maryland, E. A. Walker reported scattered distribution, "Abundant on tips of nursery stock in the field." Iowa, trace loss; Idaho, slight injury; Washington, in Yakima, King, and Pierce Counties.

Sclerotinia fructicola, brown rot, was observed in New York, New Jersey, and Maryland.

Stereum purpureum, silver leaf, was found on an apple tree in one orchard in Columbia County, New York; also observed in the 3 counties south of Columbia.

Taphrina crataegi, leaf curl, was observed in Whatcom County, Washington. This is the first report on apple from any State to the Survey.

Venturia inaequalis, scab, was reported from 30 States -- generally less prevalent throughout the country than during 1938. The highest estimate of loss was 20 percent for Wisconsin (PDR 23:187) which was less than last year. Maine, Vermont, New Jersey, and Pennsylvania each estimated 10 percent loss. In the latter State, R. S. Kirby reported an average of 62.9 percent scabby apples in 47 unsprayed orchards, an average of 8.15 percent scabby apples in 242 partly sprayed orchards and an average of 1.1 percent scabby apples in 141 completely sprayed orchards. According to O. C. Boyd, scab was much less prevalent in Massachusetts than last year owing to the unusually dry weather during June, July, and August -- estimated loss was 6 percent (PDR 23:343). Lack of sufficient rain also prevented much scab infection in New York -- estimated loss was 0.5 percent; Montana also gave the same estimate. Rhode Island, Kentucky, Oklahoma, Nebraska, and Kansas reported its occurrence. (PDR 23:150-151). A 2 percent loss was observed in Delaware (PDR 23:96,187). In New Jersey Elizabeth Clark reported that during the latter part of May scab infection was observed in a number of orchards. In some cases, the infection also appeared on the fruit pedicels and caused the apples to drop. Maryland reported the same loss as last year, 7 percent. Virginia, less prevalent than last year, estimated loss was 2 percent (PDR 24:44-48); West Virginia estimated 4 percent loss, the same as last year; and Georgia, 5 percent. In Arkansas, John C. Dunegan reported scab much more prevalent than last year or for several previous years. "Crop was reduced by freeze but scab produced further reduction by widespread leaf and fruit infection. It caused premature defoliation in many orchards." (PDR 24:79-84). H. C. Young in Ohio estimated a total loss of 8 percent which was less than last year. Indiana estimated 13 percent loss. H. W. Anderson in Illinois reported for the State average, 81.7 percent of trees infected, 0.4 percent of the leaf area and 9.4 percent of the fruit, estimated reduction in yield 8 percent (PDR 23:97, 151, 186). In Michigan, the main primary infection was during the late bloom period, loss 5 percent, which is one-half less than in 1938. Minnesota reported 5 percent loss as compared to 25 percent for 1938. "Very little scab reported even where orchards were not sprayed." (E.G.Sharvelle). In Iowa, G. C. Kent reported a total loss of 7.5 percent, less than last year. In Missouri, M. A. Smith reported scab more prevalent than for several previous years. "The moisture conditions were very favorable for ascosporic discharge and also for occurrence of primary infection. The most susceptible varieties were Rome, Ben Davis, Winesap, Red and Golden Delicious. The heaviest loss occurred south of the Missouri River" -- estimated loss 2 to 3 percent (PDR 24:48-49). Texas reported 1 percent, North Dakota, Idaho, and Washington each a trace.

Xylaria mali, black root rot, was noted in northern Virginia on old trees. It appears to be of increasing importance as the age of the orchards increases (PDR 24:44-48). C. F. Taylor reported "scattered observations" in West Virginia. In Oklahoma, K. S. Chester reported the presence of the disease. In Arkansas, John C. Dunegan (PDR 24:79-84) reported that fruiting bodies of this fungus were observed around the bases of many of the trees which were found to be infected in the Survey in 1938. Eighteen trees had been found infected in 1938 and the additional cases in 1939 brought the total to 23 in this 36-year old orchard. The disease was also found in a younger orchard on the same farm.

Bitter pit (Baldwin spot, stippen: non-parasitic) in Massachusetts was somewhat more prevalent in the orchard than in most past seasons, according to O. C. Boyd (PDR 23:343), who estimated the loss at 2 percent. Bratley and Wiant reported (PDR 24:154) that during December samples said to be representative of about 12 percent of the fruit in several carlots of Rhode Island Greening apples from western New York were examined and found to be severely affected with bitter pit. In New Jersey, according to the State Department of Plant Pathology, the disease was severe in Bergen, Essex, and Ocean Counties. In Maryland, E. A. Walker reported 1 percent loss. J. G. Brown reporting from Arizona said the disease "usually follows fluctuating soil moisture due to faulty irrigation or paucity of organic matter in the orchard soil." Scattered distribution was reported by Vaughan in Wisconsin.

Cork, etc. (non-parasitic; boron deficiency) was reported much more prevalent in Vermont than last year or an average year, owing to the dry weather during July and August plus boron deficiency -- estimated loss was 2 percent according to C. H. Blasberg. The most serious losses occurred in Addison and Windham Counties. In Massachusetts, O. C. Boyd reported the corky-core disease resulting from the drought coupled with boron deficiency, the most outstanding injury in apples this year. (PDR 23:343). New York reported the disease in Clinton and Dutchess Counties. Cork was more prevalent in New Jersey than usual. Maryland, "Soil deficient in boron", local distribution, total loss 1 percent. In northern Virginia, A. B. Groves reported that internal cork, which is principally a problem on Ben Davis and Gano, ceased to be troublesome after boron applications became general (PDR 24:44-48). Washington, in Spokane and Yakima Counties.

"Greene mottle" (Unknown, ?virus). In New York, W. D. Mills reported, "Occurs in 1 Greene County and 1 Ulster County orchard. Owner of Greene block believes trouble is spreading. No spread has been noted in Ulster block in 5 years. The disease is to be studied by D. H. Palmiter"

Internal breakdown (non-parasitic): Vermont (PDR 24:154). Maryland reported a total loss of 0.5 percent. Measles (unknown, sometimes boron deficiency) was reported from New York, New Jersey, Maryland, and Ohio. Scald (non-parasitic): Storage scald was noted on Early McIntosh September 13, in Chautauqua County, New York.

Spray injury (various spray materials): Massachusetts (PDR 23: 343). Sulfur fruit scald, sulfur leaf injury and oil injury caused traces of loss in New York. Copper russetting was found but not serious. New Jersey, copper injury was "Observed in a few orchards. Small, slightly raised purplish spots appeared on fruit, larger spots of same color appeared on foliage -- found in orchards sprayed with oil, fixed nicotine, and a copper fungicide without lime. Confined largely to Stayman. Orchards sprayed with lime sulfur were in some cases seriously injured." In Maryland, E. A. Walker pointed out that where Bordeaux mixture was used 6 percent loss was estimated. Spray injuries in Virginia were not unusually prevalent or severe; a few developments are mentioned (PDR 24:44-48). Washington.

Water core (non-parasitic). New York.

Weather injuries: Losses reported from frost injury were not as high as last year. New York reported a trace; New Jersey, severe injury; A. B. Groves pointed out that in Virginia there was more typical frost injury observed during the 1939 season than at any time during the past 10 years. This did not mean that there was the greatest amount of actual damage or loss, but rather there were more typical evidences of injury, such as frost rings, crimped leaves, etc. Estimated loss was 12 percent. (PDR 24:44-48). C. F. Taylor in West Virginia reported that the temperature fell as low as 25 to 26° F in sections of the fruit growing belt in mid-April. He estimated 12 percent loss in grade. Arkansas (PDR 24:79). Wisconsin and Iowa each reported a trace loss. In Rockland County, New York, W. J. Clark estimated the approximate number of apples affected by hail was 10,000 bushels. Little sunscald was noticed in New York this year. Minnesota reported "Noticeably less than last year." Wind injury caused a trace loss in New York, according to W. D. Mills. Winter injury was reported to have caused a trace loss in New York, Virginia (PDR 24:44-48) and Iowa. Wisconsin, "Apples growing in central and northern Wisconsin were limited to few resistant varieties." Winter injury in Washington caused 2 percent loss.

MORUS spp. MULBERRY:

Cercospora moricola, leaf spot. Oklahoma, on M. alba. Phymatotrichum omnivorum, root rot, was reported unusually destructive this spring and summer in Bryan, Brazos County, Texas. For losses on M. alba tatarica, Russian mulberry, in experimental windbreaks in Oklahoma and Texas see PDR 24:13-20. Phytomonas mori, bacterial blight, Oklahoma. I. E. Melhus reported a trace loss on M. alba tatarica, in Iowa. Sclerotinia carunculoides, popcorn disease of Morus alba was reported from Arkansas for the first time by John C. Dunegan and E. J. Allen (PDR 23:218).

MULBERRY. See MORUS spp.

OLEA EUROPAEA. OLIVE:

Cycloconium oleaginum, peacock leaf spot, was reported from Tehama County, California by C. E. Scott.

OLIVE. See OLEA EUROPAEA.
PAPAYA. See CARICA PAPAYA.
PEACH. See AMYGDALUS PERSICA.
PEAR. See PYRUS COMMUNIS
PLUM. See PRUNUS spp.
PRUNE. See PRUNUS DOMESTICA.
PRUNUS AMYGDALUS. See AMYGDALUS COMMUNIS.
PRUNUS ARMENIACA. APRICOT:

Coryneum beijerinckii, fruit and leaf spotting, was general but not important in Idaho, according to Earle C. Blodgett (PDR 24:178), who estimated a loss of 0.5 percent.

Phymatotrichum omnivorum, root rot, was reported from Texas in Mills County, where trees died in certain spots in an orchard. First progress report on the Phymatotrichum root rot losses in experimental windbreaks of Oklahoma and Texas is given in the Reporter 24:13-20.

Phytomonas pruni, bacterial blight and canker: In Sutton County, Texas, one tree with large active cankers was noted. In Montgomery County the Burbank varieties were reported badly infected. K. S. Chester in Oklahoma pointed out that fruit rot was initiated by P. pruni and followed by other decay organisms.

Sclerotinia laxa, brown rot, was less prevalent in California than in 1938 according to E. E. Wilson, who reported the disease "Bad in some localities but not in others. One rain initiated serious infection in some localities, but was apparently not long enough to initiate infection in others. The varieties most susceptible were Blenheim and Royal. Tilton was moderately susceptible."

Verticillium albo-atrum, blackheart. In California, C. E. Scott reported a young orchard seriously damaged on old cotton land in Merced County.

See Plant Disease Reporter 24:181 for non-parasitic diseases in Idaho.

Ring spot (virus). Washington in Yakima County.

PRUNUS DOMESTICA. PRUNE:

Coryneum beijerinckii, blight. In Idaho, E. C. Blodgett reported that Coryneum lesions similar to those noted in 1938 on Italian prune fruit were recorded again this year together with severe leaf spotting. (PDR 24:178.)

Dibotryon morbosum, black knot. There seems to have been little spread of this disease in New York this year.

Penicillium spp., blue mold rot. Idaho (PDR 24:156). Rhizopus spp., rhizopus rot. Idaho (PDR 24:156, 179).

Taprina pruni, plum pocket. Texas, in Colorado County, "Several trees affected in one orchard."

Tranzschelia pruni-spinosae, rust. In California, H. Earl Thomas reported that in general rust was very mild -- it built up late in season around San Francisco Bay, Santa Clara County.

Drought spot (boron deficiency) was severe and abundant on prunes in Niagara County, New York, according to J. G. Goodrich. For the State it was more prevalent than last year or in an average year -- estimated loss was 10 percent. Less injury noted this year than usual in Idaho.

Chlorosis (undetermined). A chlorosis and malformation of Italian prune leaves has been prevalent in an orchard near Weiser, Idaho for several seasons. The trouble is similar to that on the French prune recorded in 1936 (PDR 24:181). Diamond canker (undetermined) was reported by C. E. Scott from California, in Tulare, Merced, and Sutter Counties. Die back (undetermined). An excessive amount of die back was noted in a 17-year-old prune orchard at Emmett, Idaho (PDR 24:181). Leaf curl (undetermined) was less evident during 1939 (PDR 24:181). Leaf spotting (undetermined) was present to about the same extent as in 1938, in Idaho. (PDR 24:181).

Leaf drop ("Physiological" --? virus) was reported less prevalent in New York by W. D. Mills.

Leaf scorch was observed in two prune blocks in Wayne County, New York.

Mosaic (virus) in New York was reported less prevalent than for several previous year by W. D. Mills -- estimated loss a trace.

Weather injuries: Frost injury caused a trace loss in New York. Hail caused very severe damage in sections of southern Idaho (PDR 24:180).

PRUNUS spp., CHERRY:

Armillaria mellea, root rot, in Michigan was a problem in a few orchards, according to Donald Cation. The Washington Department of Plant Pathology reported the disease in Pierce County.

Coccomyces hiemalis, leaf spot, was severe again this year in several of the twenty-one States reporting. Massachusetts, New York, Maryland, Virginia, Oklahoma, and Michigan reported less, while Pennsylvania, West Virginia, Ohio, Indiana, and Iowa reported more. In West Virginia,

C. F. Taylor pointed out that unsprayed trees were defoliated by mid-August and sprayed trees by mid-September. They had no measure for the effect of this defoliation on yield. With certain test spray materials the foliage was largely retained in late October.

Coryneum beijerinckii, blight, was of slight importance on sweet cherry in Idaho, but was noted as severe on wild cherry, P. emarginata, near Myrtle in June (PDR 24:178). Washington reported a loss of 0.8 percent and Oregon, 1 percent.

Dibotryon morbosum, black knot. In New York, very little was observed. Maryland reported scattered distribution with a trace loss. Texas, in Nacogdoches County, few trees were infected at the Experiment Substation -- infection was also observed in Cherokee County.

Phytomonas syringae, bacterial gummosis, was reported by S. R. Shapley from Columbia County, New York as taking quite a heavy toll among young sweet cherries. Windsors in some orchards suffered worse during the past winter than Schmidts. Mills estimated a trace loss for the State -- also estimated a trace loss for P. pruni.

Podosphaera oxyacanthae, powdery mildew, was reported more prevalent than last year in New York, Illinois, and Iowa. General but less prevalent on sour cherry than for several previous years in Idaho. Estimated total loss, 5 percent.

Sclerotinia fructicola, brown rot, was reported generally less prevalent than during 1938. Much less prevalent in Massachusetts, owing to the dry growing season, estimated total loss was given by O. C. Boyd as 5 percent. Less prevalent in New York -- slight loss on sweet varieties and a trace on sour varieties. In New Jersey the disease caused great losses in some orchards. Maryland reported 4 percent loss on sour cherries, which is the same amount as was reported last year. In West Virginia, C. F. Taylor stated that cherries were generally picked before becoming over-ripe -- in addition they frequently received a preharvest fungicide spray. P. A. Young reported the disease epiphytotic on 6 trees in Cherokee County, Texas. In Michigan, D. Cation reported brown rot severe at East Lansing on poorly sprayed trees, estimated loss for State was 2 percent. O. H. Elmer said the disease was seldom reported from Kansas, since it had been of no economic importance in past years. The State Department of Plant Pathology reported Sclerotinia sp. general in western Washington. Losses from other States reporting were: Pennsylvania, 3.5 percent; Virginia, 10; Oklahoma, 4; Illinois, 1; Wisconsin, trace; Iowa, 5; Washington, 0.7; and Oregon, 2.

Stereum purpureum, silver leaf. W. D. Mills in New York reported "None in Orleans Montmorency block, which was heavily infected in 1935."

Taphrina cerasi, witches' broom. New York, "No reports."

Washington at Everett, Montesano, Bellingham, Sumner, Kelso, Bremerton, and Seattle. Taphrina sp., plum bladders, was reported on sand cherry (P. besseyi) from Oregon by S. M. Zeller, who stated that the original stock sand cherry was from Prof. Hansen (Dakota).

Cracking (non-parasitic). Traces in Columbia County, New York -- much less than in 2 previous years according to W. D. Mills. Idaho, damage in the Lewiston area was important but less than in 1938 (PDR 24:180). Cork (boron deficiency) in New York was reported by Mills as being more prevalent than last year. He said that the young fruits were deformed. Ripe fruits were less deformed but corky tissue persisted under the skin. The first was noted in western New York in 1925, in Hudson Valley in 1934.

Chlorosis (undet.). Bell County, Texas reported 12 percent loss. In Idaho, according to E. C. Blodgett, a peculiar chlorosis of sweet cherry, P. avium, has been observed for 4 years. The trouble has become more serious and has not responded to zinc treatments (PDR 24:181).

Virus diseases: Chlorosis (formerly called "physiological yellow leaf") on sour cherry (PDR 24:76). Keitt and Clayton report this as a destructive bud-transmissible disease of sour cherry in Wisconsin (Phytopathology 29:821, 1939). Physiological yellow leaf (?virus) was less prevalent in New York than during 1938 according to Mills. Mottle leaf was reported by Blodgett as causing 1 percent loss in Idaho. He stated that the complex suggested by this name is of importance in Idaho. Besides the true mottle leaf there are associated several symptoms such as "a ring spot", "a mosaic", "a maple leaf", "a fruit deformity", "a lace leaf" and others (PDR 24:180). Washington, in Benton County. Pink cherry on sour cherry occurred again this year in King and Pierce Counties, Washington (PDR 24:76). Pink fruit was reported from Idaho with little change in prevalence. (PDR 24:181). This is probably the same disease as pink cherry. Yellow-red virosis (X-disease of peach) was reported on chokecherries (P. virginiana) in Massachusetts by C. C. Boyd (PDR 23:259). In New York the disease was prevalent on chokecherries in Dutchess and Niagara Counties. Specimens of chokecherry collected, in the northern tier of counties in Illinois, showed typical symptoms of this disease (PDR 23:328). In Idaho the disease was reported very common on chokecherry (P. virginiana, var. demissa). (PDR 24:181).

Spray injuries: New York reported less lime sulfur injury and more copper injury than during the past two years.

Weather injuries: In Niagara County, New York, J. G. Goodrich reported that in those regions where rains had not fallen throughout the growing season the cherries were too small to harvest in some cases. Washington reported drought injury causing blossom blight and dieback in Klickitat County. Oregon reported 3 percent loss. Frost injury was reported causing 50 percent loss in West Virginia, 25 percent in Wisconsin, in Door County where most of the Wisconsin cherries are grown, 10 percent in Illinois and Virginia and traces in New York, Idaho, and Washington.

Arkansas (PDR 24:79). Winter injury was reported severe to stone fruits, especially sweet cherry, by Mills in New York. Heavy rains and high temperatures in late summer and fall were followed by a sudden drop to zero temperature in 1938 -- estimated loss 5 percent. Wisconsin also reported 5 percent loss. In Idaho there was practically no winter injury, but cherries still showed effects from the 1935-36 winter (PDR 24:180). Washington, trace in Spokane County.

PRUNUS spp., PLUM (See also P. domestica prune).

Cladosporium carpophilum, scab, in Wisconsin was reported less prevalent than for several previous years.

Coccomyces prunophorae, shot-hole, in Massachusetts was less prevalent than last year or an average year owing to the dry summer. "No reports" from New York and Minnesota.

Dibotryon morbosum, black knot, in Massachusetts was reported by C. C. Boyd as being prevalent on beach plums (P. maritima) as well as cultivated and other wild sorts -- estimated total loss 6 percent. Few new infections in New York except new growth from old knots. Green tip spray was used by most commercial growers. Maryland reported the same prevalence as last year -- 4 percent reduction in yield. Wisconsin and Iowa also reported the same amount as last year -- a trace loss in Iowa. North Dakota "not observed."

Phytomonas pruni, bacterial spot. Maryland and Ohio each reported traces. C. H. Rogers reported the disease severe on certain varieties in orchards over eastern Bell County, Texas. Wisconsin, scattered distribution. P. syringae, bacterial canker, in California was said by E. E. Wilson to be less prevalent than last year owing to low rainfall and rains of short duration. The moderate temperature during the winter was favorable to activity of canker in trees. P. tumefaciens, crowngall. New York and Maryland. Podosphaera oxyacanthae, powdery mildew. M. R. Harris sent in a report of this mildew on Wickson plum in Placer County, California.

Sclerotinia fructicola, brown rot, was said to be less prevalent in Massachusetts this year owing to the dry season -- estimated loss was set at 4 percent. New York also reported it less prevalent -- loss in grade 0.1 percent. Total loss in Maryland was estimated to be 5 percent. R. E. Vaughan in Wisconsin reported 10 percent loss, "More calls for information on brown rot than any other plum disease. It was complicated with curculio injury." Minnesota, "No reports but probably present in slight degree." Iowa, "In unsprayed plums a loss of 20 percent." Kansas, "Trace noted. Few plum trees in State, very few plums grown."

Taphrina communis, plum pockets. New York. California, in Del Norte and Mendocino Counties. T. mirabilis, hypertrophy. Oklahoma.

T. pruni, plum pockets: O. C. Boyd in Massachusetts reported that damage was limited primarily to eastern-most and southeastern towns of the State, including all of Cape Cod and the Islands. It occurred on beach plums in particular. The disease was not observed in New York and Wisconsin. In Minnesota, E. G. Sharvelle reported 1 percent loss.

Tranzschelia pruni-spinosae, rust, in Florida was reported by Erdman West as more prevalent than for several years on Excelsior plum, P. salicina x P. munsoniana, "Present every year on Experiment Station plots but very severe this fall on almost every leaf." Texas, in "Montgomery County the disease was bad on Bruce plum -- trees defoliated."

Frost injury. Arkansas (PDR 24:79).

PYRUS COMMUNIS. PEAR:

Erwinia amylovora, fire blight, was on the whole less prevalent than last year. It was reported as follows: New York, West Virginia, and Idaho each reported a trace loss; Pennsylvania, 13 percent loss; Delaware, 5 percent; Maryland, 12 percent; Virginia, 3 percent -- A. B. Groves pointed out that most plantings were old neglected Kieffers and do not blight readily, otherwise blight would probably have been more severe; Georgia reported 10 percent loss as compared to 50 percent reported in 1938; Louisiana, usual prevalence; Texas, 0.5 percent loss; Oklahoma and Iowa, each 3 percent; Ohio, 8 percent; Massachusetts and Illinois, each 1 percent; Michigan, 5 percent, "Severe generally - more on eastern side of State."; Wisconsin, 1.5 percent loss; Missouri, 0.1 percent; Arizona, 15 percent; and Washington, 0.2 percent.

Cercospora minima, leaf spot. Louisiana in East Baton Rouge, Livingston and Tangipahoa Parishes. Fabraea maculata, leaf spot, was much less prevalent than during 1938. Of the 11 States reporting, Delaware reported 5 percent, the highest estimated loss. Maryland estimated 1.8 percent loss. Oklahoma and Illinois, each 1 percent. Louisiana was the only State reporting the disease more prevalent. A. G. Plakidas said the most susceptible varieties were Pineapple, Hood, LeConte, and Richard Peters. States reporting a trace were New York, Pennsylvania, Virginia, Michigan, Wisconsin, and Missouri.

Gloeodes pomigena, sooty blotch. New York.

Leptothyrium pomi, fly speck, was much less prevalent in New York this year. W. D. Mills reported it severe the past two years.

Mycosphaerella sentina, leaf spot, was reported by Mills as being more prevalent than for several years in New York, a trace loss was estimated. In Illinois the Natural History Survey reported the disease more prevalent than during 1938 -- "Average prevalence, 100 percent of trees infected and 0.96 spots per leaf."

Penicillium expansum, blue mold, was common on pears in Idaho (PDR 24:179).

Phymatotrichum omnivorum, root rot. Texas, in Mills County the trees died in certain spots in orchards. In Dallas County the disease was general and caused severe damage.

Venturia pyrina, scab, was reported less prevalent than in 1938 in most of the 10 States reporting. Wisconsin estimated a loss of 12 percent. Delaware and Maryland each estimated 2 percent. The disease was relatively unimportant in the other reporting States.

Black end (non-parasitic) was of more concern in Idaho this year, according to E. C. Blodgett (PDR 24:180). Washington reported 3 percent loss.

Crown girdle (undet.) in Louisiana was reported by A. G. Plakidas in 7 eastern parishes and Calcasieu Parish in the Southwest.

Spray injury (various spray materials) was reported causing a trace loss in New York.

Stony pit (virus): Washington in Yakima and Klickitat Counties.

Weather injuries: Drought injury caused a loss of 5 percent in Delaware. It was also reported from 4 counties in Washington. Frost injury was reported causing a loss of 18 percent in Virginia, 5 percent in Illinois, and a trace in New York and Idaho. According to W. D. Mills, hail caused a trace loss in New York.

QUINCE. See CYDONIA OBLONGA
RASPBERRY. See RUBUS spp.

RIBES GROSSULARIA. GOOSEBERRY:

Cronartium ribicola, white pine blister rust, in Pennsylvania was reported on wild gooseberries by R. S. Kirby.

Leptosphaeria coniothyrium, cane blight, occurred in New York, according to R. F. Suit, causing a trace loss.

Pseudopeziza ribis, anthracnose, was reported generally prevalent in New York with damage slight to severe. In New Jersey it was reported severe in transplantings. Less prevalent in Wisconsin than in 1938 or for several previous years. In Idaho, E. C. Blodgett reported that anthracnose was collected on wild gooseberry near Edwardsburg. (PDR 24:179).

Puccinia caricis, rust, caused slight to moderate loss in New York. Wisconsin reported the usual prevalence.

Septoria ribis, leaf spot, in New York was reported less prevalent than in 1938, slight to severe infection.

Sphaerotheca mors-uvae, powdery mildew, was reported fr m New York causing a trace loss. Less prevalent in Wisconsin owing to the dry weather. The disease was of little importance this year in Idaho, "none on sprayed or check bushes in plots at Genesee." Washington, in Stevens, Spokane, and Whatcom Counties.

RIBES spp., CURRANT:

Cronartium ribicola, white pine blister rust, was reported from East Chatham, New York. R. S. Kirby reported a trace loss on black currant in Pennsylvania. Botryosphaeria ribis, cane blight or dieback, has been observed in commercial plantings of red currants in the Hudson Valley of New York for several past seasons. For some unknown reason it was greatly augmented in 1939 (PDR 24:43-44). Nectria cinnabarina, cane blight. New York. Pseudopeziza ribis, anthracnose. R. F. Suit reported slight to severe injury in New York, but less prevalent than last year. New Jersey. Puccinia caricis grossulariata, rust, was reported by W. G. Solheim in Fremont County, Wyoming on R. aureum, and in Lincoln County on R. setosum. Sphaerotheca mors-uvae, powdery mildew, was reported generally prevalent in New York causing slight injury.

Mosaic (virus). Local distribution, slight to severe injury in New York.

RUBUS spp., CANE FRUITS:

BLACKBERRY: Cercosporella rubi, rosette. Louisiana.

Elsinoë veneta, anthracnose, was reported less prevalent in New York. Wisconsin and Kansas.

Gymnoconia peckiana, orange rust, was reported less prevalent in New York and Wisconsin. In New Jersey the State Department of Plant Pathology reported the Eldorado variety free from rust, but an unnamed variety badly infected. G. L. Zundel in Pennsylvania reported the rust more prevalent than in 1938, estimated reduction in yield was 3 percent. In Illinois, H. W. Anderson reported the disease again very prevalent on wild blackberries throughout theState. The heavy infection in 1938 probably accounted for the continued severity of the disease (PDR 23:191). Kansas, severe in fields in Johnson and Wyandotte Counties according to J. C. Miller. Texas, trace in Smith County.

Kuehneola uredinis, rust. New York and New Jersey.

Leptosphaeria coniothyrium, cane blight. New York.

Mycosphaerella rubi, leaf spot. New York, New Jersey, Kansas, Washington, and California.

Phytomonas tumefaciens, crown gall. New York, Oklahoma, Wisconsin, Idaho, and Washington.

Sphaerotheca humuli, powdery mildew. Harold Thomas reported an unusual occurrence in Santa Cruz County, California.

Verticillium spp., wilt. In California, Harold Thomas reported some recovery after first year injury -- the greatest injury was along the coast.

BOYSENBERRY: Elsinoë veneta, anthracnose. New York. Leptosphaeria coniothyrium, cane blight, and Mycosphaerella rubi, leaf spot, were reported from Washington. Phytomonas tumefaciens, crown gall, was extremely severe on the fruiting canes in Idaho. This is the first reference to aerial galls on Boysenberry in Idaho, according to E. C. Blodgett. Verticillium alboatrum, wilt. New York. In Idaho, a canker and dieback disease of Boysenberry canes noted in 1938 but not reported was very severe this season, according to E. C. Blodgett (PDR 24:182).

Mosaic (virus). Washington.

DEWBERRY: Cercosporella rubi, rosette. Louisiana. Elsinoë veneta, anthracnose, was reported less prevalent in Wisconsin owing to the dry weather. Leptosphaeria coniothyrium, cane blight. Louisiana. Mycosphaerella rubi, leaf spot. Louisiana and Washington. Sphaerotheca humuli, powdery mildew, was reported severe on dewberry at Boise, Idaho (PDR 24:178).

RASPBERRY: Didymella applanata, spur blight, (See also Mycosphaerella rubina) was reported prevalent on bottom spurs of red raspberries in Wisconsin. Washington.

Elsinoë veneta, anthracnose, was reported by Boyd in Massachusetts as being much less prevalent than in 1938, owing to the dry weather from June to August -- estimated total loss, 2.5 percent. In New York, according to R. F. Suit, it caused very slight to slight infection on red raspberry, less prevalent than last year and slight to moderate infection on black raspberry. New Jersey. G. L. Zundel reported a reduction in yield of 3.5 percent in Pennsylvania. A 5 percent reduction in yield was reported from Maryland. In West Virginia on black raspberry J. G. Leach reported a trace loss, owing to frequent spring rains. In Ohio, H. C. Young estimated a reduction in yield of 5 percent. R. E. Vaughan reported "Considerable in northern Wisconsin where rains were more frequent in spring. Complicated with borers and winter injury." In Minnesota, E. G. Sharvelle reported anthracnose more prevalent than in 1938 or in an average year. "The Duluth crop was reduced 40 percent. All growers reported this disease rapidly becoming serious on red varieties." Estimated loss in quality for the State was set at 20 percent. According to G. C. Kent in Iowa the disease was less prevalent than for several previous years, estimated loss 3 percent. Kansas.

Fusisporium rubi, double blossom. Maryland, scattered distribution, causing a trace loss.

Gymnoconia peckiana, orange rust, in New York was reported general on black raspberry causing slight injury. New Jersey. Pennsylvania, more prevalent than last year, estimated loss 3 percent. Maryland reported a trace loss. Iowa, more prevalent than in 1938, estimated reduction in yield, 1 percent.

Leptosphaeria coniothyrium, cane blight, was reported less prevalent in most States than in 1938. It was observed in the following States: New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, Ohio, Wisconsin, Kansas, and Washington.

Mycosphaerella rubi, leaf spot, was observed in New York, New Jersey, Pennsylvania, Iowa, and Kansas. M. rubina spur blight, was observed in Massachusetts as being less prevalent than for several previous years owing to the dry season, estimated loss 3.5 percent. Less prevalent in New York than usual, most prevalent in the Hudson Valley. New Jersey reported "Evidence of spur blight on the stubble from old canes." G. L. Zundel in Pennsylvania reported a trace loss. In Minnesota, E. G. Sharvelle reported that very little occurs in most plantings, to some extent slight injury. In Idaho spur blight on red raspberry was recorded near New Meadows (PDR 24:179). This is the first report from this State to the Survey.

Phragmidium rubi-idaei, western yellow rust, was reported again this year from western Washington, also reported on R. strigosus, common red raspberry, in Wyoming.

Phytomonas tumefaciens, crown gall, was reported in Massachusetts, causing a trace loss. New York, slight injury to black raspberries. New Jersey reported, "All smaller plants died in one planting." In Maryland, E. A. Walker reported a trace loss. G. L. Zundel in Pennsylvania reported the disease less prevalent than in 1938, but still a major problem, estimated loss 7 percent. West Virginia and Ohio, each reported 2 percent loss. Usual prevalence in Wisconsin and Minnesota. In Minnesota it occurred in isolated plantings. In Idaho crown gall was reported at Moscow by E. C. Blodgett (PDR 24:178). Washington.

Pucciniastrum americanum, leaf rust. New York, slight infection on red raspberry.

Sphaerotheca humuli, powdery mildew. New York on black and red raspberries. Pennsylvania, less prevalent than last year, Latham and Cumberland were the most susceptible varieties, estimated loss 0.5 percent. Idaho (PDR 24:178).

Verticillium albo-atrum, wilt, in New York caused slight to moderate infection on black raspberry, very slight to slight infection on red raspberry and moderate to severe on purple raspberry. Verticillum spp. was reported in western California by Harold Thomas.

Virus diseases: Leaf curl in Maryland caused a trace loss according to M. Woods. Pennsylvania. In Ohio, H. C. Young estimated a 4 percent reduction in yield. R. E. Vaughan in Wisconsin reported the disease less prevalent, one reason forthis is that susceptible Cuthbert is now little grown. New York and North Dakota reported the usual prevalence. In Idaho a planting near Moscow was practically destroyed (PDR 24:180). Mosaic in New York caused slight to severe infection on black and red raspberries, and moderate to severe on purple raspberry. New Jersey reported mosaic severe in all parts of the State. Maryland, "Mostly red raspberry mosaic in black raspberries." Pennsylvania, 6 percent reduction in yield reported by Zundel. In Ohio, H. C. Young reported 5 percent reduction in yield. Less prevalent in Wisconsin than in 1938, "Roguing campaign in nurseries has reduced the amount. Tolerance is 2 percent on first inspection and 1 percent on final inspection." (R.E.Vaughan). In Minnesota, E. G. Sharvelle pointed out that this disease appears to be on the increase and probably is introduced in infected nursery stock -- estimated reduction in yield was set at 15 percent. Iowa reported a trace loss. Idaho, several plantings noted where infection was 100 percent. Washington. Streak was reported on black raspberries in New York and Maryland. The most susceptible varieties in Maryland were Cumberland, Logan, Bristol, and Dundee, estimated reduction in yield was 3 percent.

Winter injury: New York on black, red, and purple raspberries. New Jersey, "Several canes died. Leaves came out on new growth then shriveled and died." Minnesota, "Less injury in Northern sections. In some plantings all plants were killed." Iowa, more prevalent than usual, estimated loss 3 percent. Washington.

YOUNGBERRY (HYBRID DEWBERRY): Elsinoë veneta, anthracnose. Oklahoma. Leptosphaeria coniothyrium, cane blight, Washington. Mycosphaerella rubi, leaf spot, Washington. Verticillium albo-atrum, blue stem, reported by C. E. Scott in Imperial County, California.

STRAWBERRY. See FRAGARIA sp.

VACCINIUM MACROCARPON. CRANBERRY:

Guignardia vaccinii, blast, scald or early rot was reported from Washington. Penicillium spp., fruit and storage rots. Wisconsin and Washington. False blossom (virus). R. E. Vaughan reported that many nursery plantings in Wisconsin had less than 1 percent infection.

VITIS sp., GRAPE:

Aspergillus niger, black mold rot, Botrytis spp., gray mold rot, and Cladosporium. California (PDR 24:155).

Cryptosporella viticola, dead arm, was more prevalent in New York this year than it has been for several previous years, according to W. D. Mills. In Michigan, Donald Cation reported occasional vines were seen with the disease. H. W. Hewitt in California reported the disease "Severe in 1935-36-37, moderate in 1938, but very little in 1939. Infested areas involved about 1500 acres. There were no rains during the early part of the 1939 growing season."

Elsinoë ampelina, anthracnose, caused a trace loss in Maryland, according to E. A. Walker. Wisconsin reported the usual prevalence.

Guignardia bidwellii, black rot, was reported from 21 States, with loss estimates mostly lower than last year. Losses estimated were New Hampshire, no estimate; Vermont, trace; Massachusetts, 2 percent, "dry during July and August"; New York, 4 percent; New Jersey, no estimate was given, "of general occurrence"; Pennsylvania, 9 percent; Delaware, 2 percent; Maryland, Virginia, and Georgia, each 5 percent; West Virginia, 2 percent; Arkansas and Michigan, each, 10 percent; Oklahoma, 7 percent; Texas and Illinois, each, 1 percent; Ohio, 4 percent; Iowa, 0.1 percent; Nebraska and Kansas, no estimate was given, but severe damage was noted in Kansas in Wilson and Labette Counties.

Phytomonas tumefaciens, crown gall, was of little importance again in 1939.

Plasmopara viticola, downy mildew, was reported less prevalent in most of the 12 States reporting its presence. The highest losses were 2 percent in Delaware and 1 percent in Maryland and Virginia.

Uncinula necator, powdery mildew, caused losses generally of little importance, being confined mostly to a trace in the 12 States reporting its presence. Maryland and Virginia each reported 1 percent loss. In California, W. B. Hewitt reported that powdery mildew occurs in all grapevine growing areas but is controlled by sulfur dusting (PDR 24:155).

Pierce's disease of grapevines (virus). W. B. Hewitt in California reported "Severe losses in Kern, Tulare, Fresno and Madera Counties. In addition it is known to occur in San Diego, Los Angeles, Riverside, San Bernardino, Yolo, Napa, and Solano Counties."

Winter injury caused a 7 percent reduction in yield in New York. Iowa also reported some damage.

Spanish measles (undetermined) was reported in all grape growing areas in California by W. B. Hewitt.

Spotting of berries (undetermined). California (PDR 24:155).

Sulfur dioxide injury. California (PDR 24:155).

YOUNGBERRY. See RUBUS spp.

DISEASES OF NUT CROPS

For peanut see Arachis hypogea under Special Crops and for chestnut see Castanea under Trees.

CARYA PECAN. PECAN:

The following diseases were reported from Texas: Cercospora fusca, brown leaf spot, in Bell County, causing 1 percent loss, also reported from Matagorda County. Cladosporium effusum, scab, in San Saba County. Microsphaera alni, powdery mildew, was reported again this year in Bell County causing a trace loss. Phymatotrichum omnivorum, root rot, 2 reports from Brazos County. Phytomonas tumefaciens, crown gall. Leaf burn caused by excess salt.

CORYLUS sp. FILBERT, HAZELNUT:

A summary of filbert diseases in the Pacific Northwest in 1939 by P. W. Miller is given in the Reporter (PDR 23:335-337).

Dieback, probably caused by winter injury, and drought injury were reported from Washington by the State Department of Plant Pathology.

JUGLANS REGIA. PERSIAN WALNUT:

Diseases of Persian walnut in the Pacific Northwest were also reported by Paul W. Miller (PDR 23:334-335). For reports on black walnut, Juglans nigra, see Juglans under Tree Diseases.

PRUNUS AMYGDALUS. ALMOND:

Coryneum beijerinckii, blight, of almond was noted for the first time in Idaho near Whitebird, according to Earle C. Blodgett (PDR 24:178).

Sclerotinia laxa, brown rot, in California was reported less prevalent than in 1938 by E. E. Wilson. "In some localities rain failed to occur at the critical period. Drake was the most susceptible variety." Crazy top (suspected virus) in California was reported by E. C. Scott in Butte County -- mostly in Peerless, also in a few Nonpareil -- and in Solano, San Joaquin, and Yolo Counties.

DISEASES OF SPECIAL CROPS

ALEURITES FORDI. TUNG-OIL TREE:

A. G. Plakidas sent in from Louisiana the following reports: Dothiorella (Botryosphaeria) sp., nut rot, was reported from 3 eastern parishes. Phytomonas aleuritidis, bacterial leaf spot, was found mostly on nursery stock in Washington, St. Tammany and Tangipahoa Parishes. Crown girdle (undet.) caused a loss of 0.5 percent. "Dothiorella sp. and Clitocybe tabescens were found associated with the disease."

ARACHIS HYPOGAEA. PEANUT:

Cercospora sp., leaf spot. Texas reported only a trace this year. C. personata was reported by L. I. Miller as causing 33 percent loss in Virginia -- general in all peanut producing counties. "Results of 1939 field experimental work substantiated work conducted during 1938, in that sulphur and copper fungicides might be used effectively to control Cercospora leafspot. Yields following the use of sulphur dust resulted in higher increases this year than during 1938. It is thought that an explanation for this may be due to the use of a 2-week interval in the standard 3-application schedule instead of 3-week."

Phoma, leaf spot, was only noted on runner varieties in Virginia, according to Miller.

Sclerotium rolfsii, stem rot, in Virginia, according to L. I. Miller, caused an estimated reduction in yield of 2 percent. "Stem rot damage of peanuts by Sclerotium rolfsii Sacc. was most prevalent in fields in a high state of fertility. It is thought that infestation is more severe in fields which have been planted previously in soybeans. Based on this season's observations it seemed that stem-rot damage was most prevalent and caused most damage in the 'erect' varieties, bunch and Spanish." Texas reported southern blight in 5 counties.

Albinism was found in a few plants near Dilley, Texas. Chlorosis affected 10 percent of plants in a field near Dilley. (PDR 24:41-43).

Pod rot (undet.). Oklahoma.

GOSSYPIUM HIRSUTUM. COTTON:

Cotton diseases in Texas in 1939 are reported by Walter N. Ezekiel and A. A. Dunlap (PDR 24:434-439). A survey was made of cotton seedling diseases and the fungi associated with them again this year by Paul R. Miller and Richard Weindling (PDR 23:210-214). The fungi appearing in cultures made from samples collected include Glomerella gossypii, which again predominated, Fusarium moniliforme, Rhizoctonia solani, R. bataticola, Diplodia gossypina, Fusarium spp. (including F. vasinfectum), Alternaria spp., Penicillium spp., and Aspergillus spp., together with some unidentified fungi. A similar survey, conducted for the first time in 1938, was also made for boll rot diseases later in the season (PDR 23:329-334), when Glomerella gossypii was again the predominating organism. As in 1938 the other boll rot organisms occurring most frequently were Alternaria spp., Fusarium moniliforme, and other species of Fusarium.

Cercospora althaeina, leaf spot, was reported especially bad in saline spots in Jefferson County, Texas by A. A. Dunlap.

Choanephora conjuncta. Georgia (PDR 23:293).

Corticium solani, damping-off and soreshin. In Louisiana, D. C. Neal estimated 1 percent loss; also found in Cherokee County, Texas in an experimental field according to P. A. Young.

Diplodia gossypina, associated with seedling and boll rot diseases (PDR 23:210-214, 329-334).

Fusarium spp. including F. moniliforme and F. vasinfectum, associated with seedling and boll rot diseases (PDR 23:210-214, 329-334). In Louisiana D. C. Neal reported 0.5 percent loss from seedling blight. Wilt, F. vasinfectum, was found in 2 fields in Virginia, according to S. B. Fenne; North Carolina estimated 9 percent loss; in Louisiana, D. C. Neal reported 6 percent loss, which was more than for several previous years -- Half-and-Half was the most susceptible variety. V. H. Young in Arkansas reported "Scattered counts indicate less than previous year, possibly less than average -- most important cotton disease. Estimated total loss was 4 percent." P. A. Young reported wilt severe in some fields in Texas, estimated loss 1.6 percent; Oklahoma, 1 percent loss.

Glomerella gossypii, anthracnose, and boll rot were reported general in cotton counties in Virginia by S. B. Fenne, who stated that perhaps 90 percent of the cotton seed in the State is treated and that fields planted to untreated seed frequently were almost a complete failure. He estimated a total loss of 17 percent. North Carolina reported 3 percent loss, Arkansas and Oklahoma a trace and Louisiana 2 percent. (See also PDR 23:210-214, 329-334; 24: 85-92).

Heterodera marioni, root knot. In Virginia, S. B. Fenne reported an occasional plant found. North Carolina reported 2 percent loss. D. C. Neal stated that no varieties were resistant in Louisiana -- estimated loss 1 percent. Oklahoma and Arizona also estimated 1 percent loss. No specific data was reported for Arkansas, according to V. H. Young; however, he stated that the amount did not seem to vary greatly from year to year. W. N. Ezekiel reported slight loss in Texas.

Penicillium spp. associated with seedling and boll rot diseases (PDR 23:210-214, 329-334).

Phyllosticta gossypina, leaf spot. Texas, in Cherokee County.

Phymatotrichum omnivorum, root rot, appears to be present in Arkansas in small amounts in Little River and Miller Counties every year, according to V. A. Young. Texas reported an estimated reduction in yield of 6.8 percent (PDR 23:206). Oklahoma estimated 2 percent loss and Arizona 5 percent.

Phytomonas malvacearum, angular leaf spot, black arm and boll rot, was reported causing a 2 percent reduction in yield in Virginia, North Carolina and Arizona. Louisiana and Arkansas each reported 1 percent loss. Texas estimated 2.6 percent (PDR 23:206). In Oklahoma, K. Starr Chester reported 5 percent reduction in yield. "Also from Hagerman, New Mexico. 'It is spotted at the present time (August 6) but seems to be spreading with great rapidity. It is believed that some cotton has already shed as high as a bale to the acre.' A. W. Woodburn."

P. tumefaciens, crown gall. H. D. Barker reported that specimens typical of crown gall in appearance were sent to him from Arizona by C. J. King, but by the time the specimens were received the organism could not be obtained in culture although King wrote that J. G. Brown had isolated the organism from duplicate specimens. This is the first report from Arizona on cotton to the Survey.

Rhizoctonia bataticola was reported in an experimental field in Cherokee County, Texas by P. A. Young (PDR 23:210-214). R. solani, associated with cotton seedling diseases (PDR 23:210-214). Rhizopus spp. and Spicaria spp., associated with boll rots (PDR 23:329-334).

Verticillium albo-atrum, verticillium wilt, did not appear to have caused much loss in Arkansas according to V. H. Young. Texas reported 0.1 percent loss and Arizona 2 percent.

Crazy top, cause unknown. According to C. E. Scott there was one report from Kern County, California.

Deficiency diseases. Potash deficiency caused more damage in Virginia than last year. Loss in certain fields was estimated at 3 percent, according to S. B. Fenne. In the eastern sandy areas of Arkansas, V. H. Young reported 2 percent reduction in yield. In Louisiana, D. C. Neal reported "Disease is being controlled where ample potash is used, 4 to 6 percent, and when rotation and cover crop practices are employed. Estimated reduction in yield, 6 percent." He also reported that sulphur deficiency caused a trace loss. "On one farm, the average yield of 100 acres cotton was reduced from 3/4 to 1/3 bale per acre. This was most severe."

Seedling blights caused by various organisms. V. H. Young in Arkansas reported no specific data, observations indicated less than last year. Cotton seed treatment proved of great benefit (PDR 23:193).

Crinkle leaf caused by manganese toxicity and acidity was reported from Louisiana by D. C. Neal.

HUMULUS LUPULUS. HOPS:

G. R. Hoerner of the Division of Drug and Related Plants contributed the following hop-disease survey in 1939; the variety is not known unless indicated:

California:

Downy mildew [Pseudoperonospora humuli]: Sacramento County, 1 report; Sonoma County, 9 reports.

Virus disease: Sacramento County, 1 report.

Oregon:

Blight (cause unknown): Washington County, 1 report.

Canker (bacterial): Clackamas County, 1 report; Linn County, 2 reports on Early Clusters; Marion County, 1 report.

Crown gall [Phytomonas tumefaciens]: Polk County, 1 report; Yamhill County, 1 report.

Dead Hills (cause unknown): Clackamas County, 1 report.

Dormant Hills (cause unknown): Marion County, 4 reports, 1 each on Early and Late Clusters; Polk County, 1 report; Yamhill County, 1 report.

Downy mildew: Benton County, 2 reports; Clackamas County, 20 reports, 3 on Early Clusters, 2 on Late Clusters; Jackson County, 2 reports; Josephine County, 14 reports; Lane County, 9 reports, 2 on Early Clusters, 1 on Late Clusters; Linn County, 9 reports; Marion County, 110 reports, 47 on Early Clusters, 9 on Late Clusters; Polk County, 23 reports -- 1 on Brewers Gold, 8 on Early Clusters, 2 on Late Clusters; Washington County, 15 reports, 1 each on Early and Late Clusters; Yamhill County, 6 reports, 1 each on Early and Late Clusters.

Missing Hills (cause unknown): Clackamas County, 2 reports; Marion County, 9 reports, 2 on Early Clusters, 1 on Late Clusters; Polk County, 2 reports, 1 on Late Clusters; Yamhill County, 1 report.

Root rot (cause unknown): Marion County, 1 report on Late Clusters; Umatilla County, 1 report on Late Clusters; Yamhill County, 1 report on Late Clusters.

Sooty mould [Fumago?]: Josephine County, 1 report on Late Clusters; Lane County, 1 report on Early Clusters; Washington County, 1 report.

Virus disease: Clackamas County, 3 reports, 2 on Late Clusters; Marion County, 3 reports, 1 each on Fuggles and Late Clusters; Yamhill County, 1 report on Late Clusters.

Weak Hills (cause unknown): Clackamas County, 1 report; Marion County, 1 report.

Washington:

Downy mildew: Pierce County, 2 reports, 1 on Late Clusters.

Heterodera marioni, root knot nematode, was reported in Sacramento County, California by M. R. Harris.

Phytomonas tumefaciens, crown gall, occurred in Yakima County, Washington, according to the State Department of Plant Pathology.

Pseudoperonospora humuli, downy mildew, in New York was much less prevalent than for several previous years according to R. C. Magie, who estimated 0.8 percent reduction in yield. The most susceptible varieties were Early Cluster and Late Cluster. The most resistant variety was Fuggles.

A report by G. R. Hoerner on the relation of the climatology of Western Oregon to the incidence and control of downy mildew of hops is given in the Plant Disease Reporter Vol. 23: pp. 361-366. In California, C. E. Yarwood reported downy mildew more prevalent than last year -- some fields were completely infested but reduction in yield was estimated at 1 percent.

Sphaerotheca humuli, powdery mildew, in New York, as reported by R. C. Magie was much more prevalent than last year or in an average year -- estimated reduction in yield was 6 percent. All commercially grown varieties were very susceptible. Golden Hop was immune and 3 new introduced varieties, 443, R 1/9, X 35 were very resistant.

Sooty mold on aphid honey-dew was less prevalent than for several previous years in New York. The windy hot and dry weather was unfavorable to insect population (R.C.Magie).

MENTHA Spp., MINT:

Sphaceloma menthae, anthracnose, in northern Indiana caused a loss of 5 percent on peppermint according to R. C. Baines. There were frequent rains from middle of May to middle of June. In Michigan, Ray Nelson reported the disease "observed only in occasional plantings of peppermint — undoubtedly increasing -- more widely distributed each season."

Puccinia menthae, rust, was less prevalent than usual in Michigan owing to the dry weather. Usually present in most plantings but cause of only minor losses (Ray Nelson).

NICOTIANA TABACUM. TOBACCO:

Summaries of tobacco diseases for 1939 are given in the Reporter as follows: Tobacco diseases in Massachusetts, PDR 23:232-234; Tobacco diseases in Kentucky in 1939, PDR 24:11-13; Tobacco field diseases in Florida, 1939, PDR 23:383; Tobacco field survey in Wisconsin in 1939, PDR 23:306-307; Tobacco seed-bed survey in Wisconsin, 1939, PDR 23:215.

Alternaria, *Fusarium* etc., decay in curing. In Wisconsin, James Johnson reported "No damage this year as compared to extraordinary damage last year. Damage in 1938 may have exceeded $500,000. (1938 estimate was made early)."

Cercospora nicotianae, frogeye leaf spot, was very prevalent in Kentucky in 1938 and 1939 (PDR 23:281). Maryland estimated 1 percent loss. Traces were noted in North Carolina and Georgia. Damping-off (*Erwinia carotovora*, *Pythium* and *Rhizoctonia*) caused a loss of 1 percent of plants in the beds in Massachusetts according to Boyd.

Fusarium oxysporum nicotianae, fusarium wilt, was reported causing 1 percent loss in Maryland, 7 percent in North Carolina, and a trace in Georgia.

Heterodera marioni, root knot nematode. Heavy infestation in Caroline County, Virginia (PDR 23:98). North Carolina estimated 7 percent loss and Georgia, 5.5 percent.

Peronospora tabacina, downy mildew, was less prevalent than for several previous years in Massachusetts -- Boyd reported the greatest percentage of plants infected in certain beds late in season, but most damaging to the crop in a few shaded fields during July. A trace loss was estimated (PDR 23:176). He also reported downy mildew causing injury to tobacco in the field and after harvest (PDR 23:381-382). Pennsylvania and Ohio estimated a trace loss. In Pennsylvania, C. D. Burke reported that the disease appeared in beds in all areas at the close of the planting season -- too late for losses (PDR 23:177). E. A. Walker in Maryland reported the disease less prevalent than for several years, estimated loss 5 percent (PDR 23:153). Most growers in Virginia thought the disease was considerably more severe this year than in 1938 but not as severe as in 1937 (PDR 23:139, 153). In Kentucky downy mildew appeared first in old plant beds (PDR 23:176, 191). In North Carolina, R. J. Haskell reported the disease found in 25 out of 137 beds examined in Durham, Johnston, Wayne, Wilson, and Wake Counties, May 11 to 16. It was found for the first time this season in the State on March 8 (PDR 23:88,112). Downy mildew was generally distributed throughout South Carolina, but was retarded by clear weather (PDR 23:112). In Georgia a preliminary survey of the downy mildew situation in the flue-cured tobacco area for 1939 indicated that the epidemic was of moderate severity compared to 1937 as a severe year and 1938 as a light year (PDR 23: 51,112-113, 177). Downy mildew was first found this season in Florida on five tobacco beds on February 9 and 10. It was estimated that the loss of plants from this disease and frost together was as high as 50 percent in certain counties (PDR 23:83). County agents reported downy mildew in northern Indiana.

Phytophthora parasitica nicotianae, black shank. The first authenic case of this disease in Virginia was found during the latter part of the 1939 growing season (PDR 23:369-370). Black shank was found in August on four farms in Logan County, Kentucky and on one farm in Robertson County, Tennessee (PDR 24:10-11). North Carolina reported 0.5 percent reduction in yield and Georgia reported a trace.

Phymatotrichum omnivorum, root rot, was reported from Texas on N. glauca.

Phytomonas angulata, angular leaf spot, blackfire. Although this leaf spot, which was so widespread and damaging in the field in Massachusetts last year, was present in most fields this year, it remained strictly suppressed according to C. C. Boyd (PDR 23:246). The season was too dry during June, July, and August. The usual trace of loss was reported from Maryland. Kentucky (PDR 23:154). H. C. Young reported a trace loss in Ohio. In Wisconsin, Johnson reported practically no disease as compared to 1938. Apparently no watersoaking appeared.

Phytomonas solanacearum, Granville wilt, was found for the first time in Maryland causing a trace loss (PDR 24:63). North Carolina reported 7 percent loss and Georgia a trace.

Phytomonas tabaci, wildfire, was observed on only 2 farms in Massachusetts -- both in Hampden County (PDR 23:346). In Pennsylvania, O. D. Burke reported "Due to the long dry periods wildfire although present in most fields caused less injury than in 1938. The weather was dry and warmer than usual during the growing season." The estimated State loss was 12 percent. From Maryland, E. A. Walker reported 3 percent reduction in yield (PDR 23:153). In areas in western Kentucky and northern Tennessee wildfire caused sufficient damage so that many growers cut their dark tobacco before it was ripe (PDR 154, 176, 192, 281). H. C. Young reported a loss of 1 percent in Ohio, which is less than last year. In Wisconsin, James Johnson reported wildfire less than for several previous years. It was found on 17 farms in seed beds but no spread developed in fields. (PDR 23:307).

Thielaviopsis basicola, black root rot, was reported less prevalent in Massachusetts than for several previous years (PDR 23:343). O. D. Burke reported root rot as present in Pennsylvania, but never a serious disease. Usual prevalence in Maryland, with 0.7 percent loss. Kentucky.

J. D. Leach reported a total loss of 5 percent in West Virginia. "Maximum infection takes place between 17° and 23° C (soil temperature)." North Carolina and Ohio each reported a trace. Wisconsin estimated 1 percent loss. "Disease was favored by cold soils. Loss only in old fields with Comstock Spanish or Havana seed."

Brown root rot (undet.) in Massachusetts according to O. C. Boyd was less prevalent than for several previous years, a trace loss was estimated (PDR 23:343). E. A. Walker reported 0.5 percent loss in Maryland. In Wisconsin, James Johnson reported brown root rot severe in only a few fields this year -- reason not known. (Johnson, J. Studies on the nature of brown root rot of tobacco and other plants Jour. Agr. Res. 58: 843-863. June 1, 1939.)

Frenching (non-parasitic). Pennsylvania, North Carolina, and Georgia each reported a trace loss. Maryland estimated 1 percent loss. Kentucky. Only seen in 2 fields in Wisconsin.

Potash deficiency. An estimated reduction of 2 percent was reported for Maryland. In Wisconsin, James Johnson reported "Less than 1 percent of fields show some indication of lack of potash." A trace loss was noted in Georgia.

Mosaic (virus). Mosaic proved to be about normal in Massachusetts -- 7 percent loss was estimated (PDR 23:343). In Pennsylvania, O. D. Burke estimated 1.5 percent loss. Maryland reported 6 percent loss and North Carolina 3 percent. Kentucky. Texas, in Hidalgo County, a trace. In Wisconsin, James Johnson said "One field of about 5 acres with 100 percent cucumber mosaic caused almost 50 percent reduction in yield and quality. Season being relatively dry and free from storms reduced infection in the soil." A trace loss for the State was estimated.

Other virus diseases. Ringspot in Pennsylvania is gradually becoming more prevalent and is present in every field but losses are light. (O.D.Burke). The usual 1 percent loss occurred in Maryland. Ring spot was reported from Cook County, Georgia in May. Streak was reported from Kentucky and Wisconsin.

Cold injury: Tobacco plants in all parts of Kentucky were severely injured by cold (PDR 23:154).

RICINUS COMMUNIS. CASTOR BEAN:

Alternaria sp., leaf spot, was reported from Hidalgo County, Texas by G. H. Godfrey.

Cercospora ricinella, leaf spot, was collected in Cameron County, Texas by P. A. Young, and reported from Hidalgo County by G. H. Godfrey.

D I S E A S E S O F S U G A R C R O P S

BETA VULGARIS. SUGAR BEET:

Aphanomyces cochlioides, root rot, was reported by W. F. Buckholtz as being much less prevalent in Iowa than in 1938. "It was found only in scattered fields. The weather was too dry for this disease to be serious. It was found in fields cropped frequently to beets. Estimated total loss was 2 percent."

Bacillus sp., bacterial root rot. Washington.

Cercospora beticola, leaf spot, according to H. C. Young was more prevalent than last year in Ohio. Estimated total loss was 9 percent. J. H. Muncie in Michigan reported 15 percent loss. In Wisconsin, Vaughan stated that the rainy period in mid-August was followed by considerable leaf spot with an estimated loss 0.5 percent. Buckholtz in Iowa reported 5 percent loss, less prevalent owing to the dry weather. Pennsylvania and Wyoming reported traces. G. H. Starr reported that he saw heavier-infected individual plants than he had ever seen before in Wyoming.

Peronospora schachtii, downy mildew. In the coastal area of California there was moderate infection. In the interior valleys infection was almost entirely absent. Low rainfall and dry conditions were unfavorable for infection. (L. D. Leach).

Phoma betae, leaf spot and root rot, caused little damage in 1939. Its occurrence was reported from Ohio, Michigan, Wisconsin, and Iowa.

Damping off due to Pythium, Rhizoctonia or Phoma caused less damage in California than for several previous years. "Seed-borne Phoma and to some extent soil-borne Pythium and Rhizoctonia were responsible for loss of stand on about 600 acres in Butte County and 1,000 acres in Ventura County" (L.D.Leach). Pythium sp., black root, caused a trace loss in Michigan. P. debaryanum, damping-off, was reported causing 3 percent loss in Iowa.

Ramularia betae, leaf spot. Washington.

Rhizoctonia sp., crown rot. Trace loss in Wisconsin.

R. solani, dry rot canker and root rot. Dry rot canker, California. Root rot caused traces of loss in Michigan, Wisconsin, Idaho, and Wyoming.

Sclerotium rolfsii, southern root rot, was less prevalent in California, causing a loss of 0.5 percent. Losses were severe in individual fields, but heavily infested fields were avoided. 2,500 acres were indexed by the soil sampling method to detect severe infestations. (L.D.Leach).

Uromyces betae, rust. Washington in Whatcom County.

Verticillium sp., verticillium wilt. In the latter part of August, an unusual wilt of the sugar beet was observed in fields in the vicinity of Ault, Colorado. (John O. Gaskill and W. A. Kreutzer, Verticillium wilt of the sugar beet. Phytopath. 30:769-774. Sept. 1940). This appears to be the first occurrence of this disease on sugar beet in North America.

Curly top (virus) was reported causing the following losses: Oregon, 5 percent; Washington, 3; Arizona, 1.7; Idaho, 1 and Montana, a trace. (PDR 24:133). Savoy disease (virus). This disease is becoming more and more common in northern Iowa. It was very common in 1939, but not very destructive, or if so we are not aware of it (W.F.Buckholtz). Heart rot, probably caused by boron deficiency, was noted in Winnebago, Marinette, Fond du Lac, and Waushara Counties in Wisconsin, causing 2 percent reduction in yield (R.E.Vaughan).

SACCHARUM OFFICINARUM. SUGAR CANE:

P. J. Mills reported the following diseases from Louisiana: red rot, (Colletotrichum falcatum), less prevalent than in 1938; Cytospora leaf sheath rot (Cytospora sacchari); pokkah bong (Fusarium moniliforme), less prevalent than in 1938. C. P. 28-19 susceptible; red stripe (Phytomonas rubrilineans), and mottled stripe (P. rubrisubalbricans) only traces observed, less prevalent than in 1938; root disease (Pythium spp.) infected the variety C.P. 28-19 most severely of the eight commercial varieties; red spot of leaf sheath (Sclerotium rolfsii), traces to slight infections. Mosaic (virus) C.P. 29-116 trace of green mosaic. C.P. 28-11, C.P. 28-19, trace yellow mosaic, C.P. 29-320 trace green mosaic. C.O. 290, 4 to 100 percent green mosaic. C.O. 281, 100 percent green mosaic. Multiple bud (undet.), found on C.P. 29-116, C.P. 29-103, and P.O. J. 234.

DISEASES OF TREES

The following list of articles on tree diseases which appeared in the Reporter supplements this summary.

Carter, J. C. Some isolations of Verticillium in Illinois during 1938 and 1939. 24:133.

Ellis, Don E. Conifer diseases hitherto unreported from the southwest. 23:341.

Fowler, Marvin E. Ceratostomella (Endoconidiophora) on planetrees. 23: 154-155.

Hahn, Glenn G. Distribution and hosts of cedar blight in the United States. 24: 52-57.

__________ Reports of cedar blight in 1939. 24:57-58.

Hedgcock, George G. Notes on the occurrence of Coleosporium in the southeastern United States during 1938 and 1939. 23:268-277.

__________ Notes on the distribution of fungi collected in the southeastern United States in 1938 and 1939. 24:320-325.

Lorenz, Rolland C. and Ross W. Davidson. Observations on several diseases of hardwoods in the Lake States 23:384-385.
Stoddard, E. M., A. D. McDonnell, and H. W. Hicock. Fomes annosus on conifers in Connecticut 23:385-386.
U. S. Dept. Agr., Bureau of Entomology and Plant Quarantine. Spread of white pine blister rust during the calendar year 1939. 24:31-34.
Waterman, Alma M. The disease of pines caused by Sphaeropsis ellisi. 23:93-95.
______________. Diseases of shade and ornamental trees: Summary of specimens received in 1939 at the New Haven Office, Division of Forest Pathology. 24:157-159.
Wright, Ernest. First progress report on the Phymatotrichum root rot losses in experimental windbreaks of Oklahoma and Texas. 24:13-20.

NURSERY DISEASES IN THE GREAT PLAINS REGION, 1939:

Damping-off of both conifers and broadleaves in Federal nurseries throughout this region appeared somewhat heavier in 1939 than in the previous year. This was especially true for ponderosa pine at Halsey, Nebraska. The shot-hole disease (Coccomyces lutescens) of chokecherry was in general not as severe as in 1938. This disease was most damaging from Kansas northward, while the so-called leaf rust (Marssonia sp.) of green ash was only severe from Nebraska north.

Puccinia fraxinata was observed on green ash in northern nurseries but infections were not as common as in 1938. The same was true for Melampsora spp. on cottonwood.

Bacterium mori [Phytomonas mori] was abundant in the South and was particularly damaging to mulberry at Muskogee, Oklahoma.

Phomopsis juniperovora, blight, on eastern red cedar was negligible in Great Plains nurseries in 1939, although the disease caused some damage at Fremont, Nebraska, and Manhattan, Kansas. (Ernest Wright, Division of Forest Pathology, Bureau of Plant Industry.)

NOTES ON TREE DISEASES IN CALIFORNIA AND UTAH, 1939:

California: Frost killing of new growth of both broadleaves and conifers was marked in the Sierra Nevada as a result of freezing weather in early June. Killing was especially pronounced on young growth of Abies concolor and Pseudotsuga taxifolia, rendering much potential Christmas tree stock unsalable.

It was noted that in contrast to 1938, when sporophores of Polyporus amarus were unusually common on Libocedrus decurrens, they were correspondingly scarce in 1939. The year was relatively dry, with little accumulated snow and it is believed that the relative absence of sporophores was correlated with these conditions.

An unusually heavy local infection of Populus tremuloides by Marssonina populi was reported on the Goosenest Division of the Shasta National Forest. Invasion of the leaf petioles by the fungus brought about a pronounced parching of the leaves.

Utah: Marssonina populi was noted as very prevalent on Populus tremuloides in Logan Canyon during the latter part of the summer by G. A. Zentmyer, Jr. Groups of affected trees dotted the canyon slopes and were recognizable at some distance. (Willis W. Wagener, Division of Forest Pathology, Bureau of Plant Industry, in cooperation with Civilian Conservation Corps.)

DROUGHT INJURY IN MASSACHUSETTS:

Outstanding in most sections of the State in many ornamental trees and shrubs as well as in trees in the forest (PDR 23:343).

HARDWOODS

SOME DISEASES OF NOTE IN THE UPPER MISSISSIPPI VALLEY, 1939:

The most prevalent leaf disease of broadleaf species of the upper Mississippi Valley was the one caused by Piggotia fraxini (Marssonia fraxini) on ash. This disease caused severe reduction of nursery production in most nurseries.

Leaf diseases of crabapple (Malus spp.) and hawthorn (Crataegus sp.) species were very severe. The organisms involved in these leaf-spot diseases were species of Entomosporium, Marssonia, Fabraea, Phyllosticta, and probably Septoria. The host species that suffered most were Crataegus mollis, Malus ioensis, M. glaucescens, and M. coronaria. M. baccata was entirely free from disease.

The rust of Malus and Crataegus species caused by species of Gymnosporangium was widely prevalent throughout the upper Mississippi Valley.

The rust on burr oak (Quercus macrocarpa), red oak (Q. rubra), and white oak (Q. alba) caused by species of Cronartium, and the rust of poplars (Populus spp.) caused by a species of Melampsora were common. The species of poplar most susceptible to the rust disease were, in descending order of severity of infection: Populus balsamifera, a species called "Northwest poplar", P. candicans, Van Gent's poplar, and P. carreiriana. (George Y. Young, Division of Forest Pathology, Bureau of Plant Industry, in cooperation with Civilian Conservation Corps.)

ACER spp. MAPLE:

Armillaria mellea, shoe-string rot, on Acer sp., A. platanoides, and A. saccharum in New Jersey.

Cylindrosporium consociatum, on A. glabrum, in Grand Teton National Park, Wyoming (W.G.Solheim).

Cytospora sp., canker. Scattered distribution in Massachusetts.

Gloeosporium spp., anthracnose, New Hampshire. In Michigan this disease was of no importance according to F. C. Strong. G. apocryptum, anthracnose, in Massachusetts, according to W. H. Davis, was less prevalent, only 2 trees seen infected.

Leptothyrium acerinum, leaf spot, on A. saccharum in Oklahoma.

Macrophoma negundinis, leaf spot on A. negundo in Oklahoma.

Nectria ditissima, canker, in Massachusetts was more prevalent than in 1938, according to W. H. Davis. It was collected at 4 stations.

Phleospora aceris, leaf spot on Acer spp., was less prevalent than in 1938 in Massachusetts. C. W. Edgerton sent in a report of this leaf spot on A. saccharinum from Louisiana.

Phyllosticta spp., leaf spot, Massachusetts and Oklahoma.

Phytomonas aceris, bacterial leaf spot, occurs on native maples. (Ark, P. A. Bacterial leaf spot of maple. Phytopath. 29:968-970. 1939.)

Rhytisma acerinum, tar-spot. New Hampshire. Less prevalent than for several years in Massachusetts according to Davis and McKenzie. In Michigan, F. C. Strong reported the smallest amount observed in several years. R. E. Vaughan in Wisconsin reported the usual prevalence.

Taphrina dearnessii, leaf blight. Oklahoma.

Verticillium sp. (also reported as V. albo-atrum), wilt, in Massachusetts was reported state-wide by M. A. McKenzie on A. saccharum, A. platanoides, and A. pseudo-platanus. The New Jersey Department of Plant Pathology reported "Wilt of maple was noted in many sections of the State. The symptoms in all instances were typical of this disease but in some cases the cultures did not yield the Verticillium organism." In West Virginia, according to J. G. Leach many trees died during the summer probably of this disease. F. C. Strong in Michigan reported about the same frequency as in previous years. In Wisconsin, R. E. Vaughan said a few more trees in city plantings were infected. Leaf scorch (non-parasitic), New Hampshire and New Jersey.

AESCULUS HIPPOCASTANUM. HORSECHESTNUT:

Fomes sp., heart rot. New Jersey.

Guignardia aesculi, leaf blotch, according to Davis often causes defoliation in Massachusetts in midsummer; however, there was very little leaf fall in 1939. The disease showed up in September, which is later in the season than usual (PDR 23:346). More abundant in New Jersey than usual. Michigan, slight to heavy infection on all horsechestnut trees examined this year (F.C. Strong).

Nectria sp., canker. Massachusetts.

Drought injury. Washington.

ALBIZZIA JULIBRISSIN. MIMOSA:

Fusarium perniciosum, wilt. North Carolina.

ALNUS INCANA. SPECKLED ALDER:

Taphrina robinsoniana, bract curl of catkins. Oklahoma.

ARBUTUS MENZIESII. MADRONE:

Leaf blight (non-parasitic). Washington, in Thurston County.

BETULA spp. BIRCH:

Polyporus hirsutus, wood rot and Stereum rameale, trunk rot, were reported from Oklahoma.

Drought injury. The New Jersey Department of Plant Pathology reported that many trees showed the effects of the hot dry weather. Many of the deciduous trees showed definite leaf scorch symptoms.

BUMELIA LANUGINOSA. FALSE BUCKTHORN:

Phyllosticta bumeliae, leaf spot. Texas, in Cherokee County.

CARPINUS CAROLINIANA. AMERICAN HORNBEAM:

Pezicula carpinea, trunk rot. Oklahoma.

Phyllosticta sp. leaf spot. Oklahoma.

CARYA spp. HICKORY:

Diplodia caryogena, leaf spot, Oklahoma on C. cordiformis.

Sphaeropsis linearis, leaf spot, Oklahoma on Carya sp., and C. cordiformis.

Vermicularia sp., leaf spot. Oklahoma.

CASTANEA spp., CHESTNUT:

Endothia parasitica, blight, in New Jersey was prevalent on some seven-year old specimens according to the State Plant Pathology Department. In California, M. R. Harris reported the disease in the same orchards in San Joaquin County as previously reported.

Drought caused marginal and interveinal chlorosis in Walla Walla County, Washington.

CATALPA spp., CATALPA:

Cercospora sp., leaf spot. New York.

Leaf spots caused by C. catalpae, Gloeosporium catalpae, and Macrosporium catalpae were reported less prevalent than for several years in Massachusetts by McKenzie.

Microsphaera alni vaccinii, powdery mildew. Massachusetts.

Phyllosticta sp., leaf spot. Massachusetts. P. catalpae, leaf spot. More abundant than usual in New Jersey.

Chlorosis caused by too much lime in the soil was reported from Texas.

CELTIS OCCIDENTALIS. HACKBERRY:

Two leaf spots, Phyllosticta celtidis and Ramularia celtidis were reported from Oklahoma by W. W. Ray. Septobasidium sydowii was reported from Texas by C. H. Rogers. "Rather severe on trees in one location causing stunting and witches' broom-like effect on branches." Valsa celtidis, wood rot. Oklahoma.

CERCIS CANADENSIS. REDBUD:

Discosia artocreas and Mycosphaerella cercidicola, leaf spots, were reported from Oklahoma by W. W. Ray.

Phymatotrichum omnivorum, root rot. Texas.

CORNUS spp. DOGWOOD:

Alternaria sp., leaf spot, was reported in Oklahoma on C. asperifolia.

Phymatotrichum omnivorum, root rot. Texas.

Phytophthora cactorum, canker. In Massachusetts, C. J. Gilgut reported 5 out of 10 trees diseased on one property -- more prevalent than last year.

CRATAEGUS spp., HAWTHORN:

Entomosporium thuemenii, leaf spot. Oregon.

Erwinia amylovora, fire blight, in New Jersey was prevalent on many hawthorns.

Fabraea maculata, leaf spot, in Massachusetts was less prevalent than usual. In Michigan, F. C. Strong reported many planted trees, particularly Paul's Scarlet hawthorn, were affected. It was most severe on close plantings.

Gymnosporangium spp. rust. Massachusetts, Oklahoma. Missouri on wild thorned Crataegus. G. clavipes, quince rust, was prevalent on many hawthorns in New Jersey and Virginia. G. globosum, hawthorn rust, was observed in Michigan.

Venturia inaequalis orbicularis, scab. Washington, in Lincoln County.

DIOSPYROS spp., PERSIMMON:

Cephalosporium sp. wilt, which has been so destructive in the southeastern States was found at Dallas, Texas in June (PDR 23:347; 24: 168-169. Map).

Black leaf spot was very common in Oklahoma.

FAGUS spp., BEECH:

Fumago vagans, sooty blotch, was common on many beech trees in New Jersey. This organism thrives in the sugary substance secreted by aphids.

Gloeosporium fagi, leaf spot. Massachusetts.

Nectria cinnabarina, canker. In Massachusetts, W. H. Davis reported, "More fruiting bodies and more cankers were found this year than in other years."

Scorias spongiosa caused a trace loss in Pennsylvania, according to R. S. Kirby.

Leaf mottle. A large number of American beeches affected with the leaf mottle disease described in Phytopathology 18:151-152, 1928, are under observation. The possibilities that insects, nutrient deficiencies, lack of water, or parasitic fungi are responsible have been largely eliminated by the various specialists in these fields at the Station. (New Jersey Department of Plant Pathology).

Leaf scorch was very common in New Jersey. This condition was aggravated by the dry climatic conditions.

FRAXINUS spp., ASH:

Clylindrosporium sp., leaf spot, was observed on F. toumeyi in Oklahoma, and on Fraxinus spp., in Iowa.

Fomes fraxinophilus, heart-rot, usual prevalence in North Dakota on F. lanceolata.

Phyllosticta sp., leaf spot. Massachusetts; on F. velutina in Oklahoma. P. viridis, leaf spot, on F. americana in Oklahoma.

Puccinia fraxinata, rust. Massachusetts.

Septoria sp., on F. nigra in Oklahoma.

ILEX spp. HOLLY:

Boydia insculpta, canker. Reported as doing considerable damage to holly hedges and trees in the Puget Sound District of Washington. This is believed to be the first report of this fungus in America. (PDR 23:48).

Fumago spp., sooty mold. Washington.

Phomopsis sp., canker. Washington.

Phyllosticta ilicicola, leaf spot. New Jersey.

Chlorosis. Texas.

JUGLANS spp. WALNUT:

Gnomonia leptostyla, anthracnose, on black walnut in Massachusetts. According to F. C. Strong in Michigan this disease regularly defoliates walnut 2 weeks early every year.

Marssonina juglandis, leaf spot. New Jersey.

Phymatotrichum omnivorum, root rot, on J. rupestris in Texas.

MALUS sp., FLOWERING CRAB:

Gymnosporangium clavipes, quince rust, New Jersey.

G. juniperi-virginianae, cedar apple rust. Michigan, much more prevalent than usual.

PLATANUS spp., PLANETREE, SYCAMORE:

STATUS OF THE LONDON PLANE DISEASE (CANKER STAIN):

The canker-stain disease of London planes was severe and continued to spread in plantings in the vicinity of Philadelphia, Pennsylvania;

Baltimore, Maryland; and Washington, D. C. New locations were established for the disease by isolation of the causal organism (Ceratostomella sp.) from specimens from Newark, New Jersey; Claymont, Deleware; Williamsburg, Virginia; Magnolia, North Carolina; South Charleston, West Virginia; and Vicksburg, Mississippi.

Native Platanus occidentalis, the American plane, was found affected by the disease. Inoculations also showed it to be susceptible. This was the first time reliable evidence revealed this species as a host for the pathogen. Previously the only known host of the disease was P. acerifolia, the London plane.

Studies during the year revealed that the disease could be transmitted readily on pruning tools; also, that many commercial wound dressings were not antiseptic to the causal organism of the disease. (Paul V. Mook, Division of Forest Pathology, Bureau of Plant Industry.) See also PDR 23:154-156.

Gnomonia veneta, anthracnose. McKenzie in Massachusetts reported less leaf injury in Massachusetts this year than for several previous years. In New Jersey it has been present in isolated spots for several years. Quite general this year. Texas, in Red River County. Less prevalent in Michigan owing to the dry weather.

Hypoxylon sp., dieback, on P. occidentalis, in Oklahoma.

POPULUS spp. POPLAR, COTTONWOOD, ASPEN:

Cylindrosporium oculatum, leaf spot, on P. deltoides, southern cottonwood in Oklahoma.

Cytospora sp., canker. Several cankers were noted on the twigs and branches of poplar in New Jersey. Microscopic examinations revealed the presence of both Cytospora sp., and Dothichiza populea. C. chrysosperma, canker, in North Dakota caused 75 percent infection in one planting of young trees, 14 feet high.

Dothichiza populea, canker. Massachusetts reported infection plentiful, but fewer trees died from the disease. In New Jersey the symptoms resembled fire blight. Sixty percent of shoots were dead and cankers were present on the stems. In Wisconsin the disease developed in the nursery stage, which required replacement of many orders.

Fusicladium tremulae, leaf wilt. As many as 30 percent of seedlings were infected and tips killed in areas on which figures were obtained in Itasca Park, Minnesota (C.C.Christensen).

Marssonina populi, anthracnose. Oklahoma on P. alba.

Melampsora sp., rust. Less prevalent in Wisconsin, owing to the dry weather. M. abietis-canadensis, rust. Less prevalent in Massachusetts than for several previous years.

M. aecidioides, rust, on P. alba in Santa Cruz County, California.

Phymatotrichum omnivorum, root rot, caused severe damage in Brazos County, Texas.

Polyporus versicolor, white spongy rot. Washington, in Pierce County.

Trochila populorum, leaf spot. Less prevalent in Michigan than usual. F. C. Strong believed that dry weather at the critical period when spores were being disseminated prevented heavy increases in infection.

Valsa sp., canker. Oklahoma.

PRUNUS spp., CHOKECHERRY:

Podosphaera oxyacanthae, powdery mildew, on western chokecherry, P. virginiana var. demissa, in Whitman County, Washington.

Yellow-red virosis (X-disease), on chokecherry, P. virginiana, is definitely more prevalent in southern than in northern Massachusetts, according to O. C. Boyd (PDR 23:259, 341-342). E. M. Stoddard reported continued spread in Connecticut (PDR 23:386). In New York the disease was much more prevalent than for several previous years according to E.M. Hildebrand. In all three States the diseased chokecherries are a menace to peach growing. The disease was found for the first time on chokecherries only, in Wisconsin according to E.M. Stodard (l.c.), and in northern Illinois according to H. F. Seifert and H. W. Anderson (23:328). The chokecherry is rare in southern Illinois where peaches are grown commercially.

PTELEA TRIFOLIATA. HOP TREE, WAFER ASH:

Puccinia windsoriae, rust. George Washington National Forest, Virginia. Oklahoma in Payne County. Missouri.

QUERCUS spp. OAK:

Arachnopeziza aurelia was collected near Great Falls, Virginia on fallen oak leaves. Determination was made by E. K. Cash.

Armillaria mellea. During the past season more than a dozen cases of death of shade trees in New Jersey caused by the shoe-string fungus were investigated. Black oak, sugar maple, Norway maple and mountain ash seemed to be the most commonly infected. The trees under study wilted almost overnight. An examination of the lower trunk showed that the fungus mat extended completely around the tree between the bark and the sapwood. The infection probably originated during the extremely wet 1938 season and has progressed rather slowly in 1939. The sudden wilting was caused by the girdling of the trunk due to the action of the fungus. (New Jersey Department of Plant Pathology).

Diplodia longispora, leaf blight, of chestnut oak, Q. prinus, was prevalent in many areas throughout New Jersey.

Fumago sp., sooty mold. Washington.

Gnomonia veneta, leaf blight, was very severe in some sections of New Jersey. It caused complete defoliation of both oaks and sycamore during the past few seasons. In Michigan the disease was much less prevalent than for several previous years on both sycamore and oak hosts, according to F. C. Strong. Also reported less prevalent in Wisconsin. R. E. Vaughan says that it can be checked with Bordeaux applied in a semi-dormant spray.

Hypoxylon atropunctata, trunk rot. Oklahoma.

Macrophoma nervicola, leaf spot. Oklahoma.

Rhytisma erythrosporum, tar spot. Texas in Bell County on live oak, Q. virginiana.

Sphaeropsis sp., black rot. New Jersey.

Taphrina coerulescens, leaf blister. Oklahoma on Quercus sp., Q. marilandica, and Q. falcata f. triloba. Texas, on Q. virginiana.

Chlorosis (non-parasitic). Several pin oaks, Q. palustris, on Craton Parkway, Newark, New Jersey showed symptoms of chlorosis in 1938.

RHAMNUS CATHARTICA. BUCKTHORN:

Puccinia coronata, crown rust, was reported much less prevalent in North Dakota than in 1938.

RHUS spp., SUMAC:

Phymatotrichum omnivorum, root rot, in Bell County, Texas.

Verticillium sp., wilt, on fragrant sumac, R. aromatica, in Massachusetts.

V. albo-atrum, wilt. Minnesota according to L. Dosdall, "First report. Disease occurred in epidemic form in Ramsey and Hennepin Counties on both the wild smooth and staghorn sumac."

ROBINIA PSEUDOACACIA, BLACK LOCUST:

Fomes applanatus, heart rot, was reported from Los Angeles County, California by M. R. Harris. First report on this host from California in the Survey files.

Leaf drop (undetermined). Washington, in Benton County.

Dieback caused by winter injury was also reported from Washington.

SALIX spp. WILLOW:

Cytospora chrysosperma, canker. Usual prevalence reported in Massachusetts and Wisconsin.

Fomes igniarius, white trunk rot. Washington, in Grays Harbor County.

Fusicladium saliciperdum, scab. McKenzie reported the disease much less prevalent in central and western Massachusetts than usual and less prevalent even on the coast. New Jersey. In Vermont, H. L.Bailey reported willow blight as prevalent as last year, but much less prevalent than in an average year. "Average year refers to the period of heavy infection about 1935 to 1936 and 1937."

Marssonina sp., anthracnose. Oklahoma, in Payne County.

M. kriegeriana, leaf spot, was collected on S. exigua by W. G. Solheim in Albany County, Wyoming.

Melampsora bigelowii, rust. Oklahoma, in Muskogee County.

M. ribesii-purpureae, rust, was collected in Wyoming by W. G. Solheim in 1937, on Salix sp., 1938 on S. bebbiana, and 1939 on S. scouleriana.

Phymatotrichum omnivorum, root rot. Texas.

Phytomonas tumefaciens, crown gall. New Jersey.

Uncinula salicis, powdery mildew, on S. glaucophylla var. collected at Presque Isle, Erie County, Pennsylvania in 1906. Specimen sent in by C. R. Ball June 26, 1939, and determined by J. A. Stevenson. Also reported from New Jersey on Salix sp.

SASSAFRAS ALBIDUM, SASSAFRAS:

Phyllosticta sp., leaf spot. Oklahoma.

Yellows (cause undetermined --? virus). P. A. Young reported many sassafras trees at the Tomato Disease Laboratory at Jacksonville, Texas, showed severe symptoms, resembling those of a virus disease, in August 1939. The disease appeared on sassafras sprouts 2 to 6 feet tall, growing rapidly in a well-fertilized sandy field that had been used for tomatoes the preceding year (PDR 23:278).

ULMUS spp., ELM:

Ceratostomella ulmi, Dutch elm disease. First record confirmations extended the main infection area into Litchfield County, Connecticut, Columbia County, New York, Monroe and Lehigh Counties, Pennsylvania and Burlington County, New Jersey. A new isolated area adjacent to the Pennsylvania line in south central New York was found with the discovery of a number of diseased trees in Broome and Cenango Counties. A second tree was confirmed in Cumberland, Maryland, where the only previous infectio recorded was in 1936. Diseased trees continue to be found in the Athens, Ohio, and Indianapolis areas. No infections were found in other outlying areas in 1939.

Coniothyrium sp., Massachusetts.

Cytospora sp., canker. Massachusetts, common on dead twigs.

Dothiorella ulmi, cephalosporium wilt. McKenzie reported affected elms were found in 138 towns in Massachusetts up to December 31, 1939. According to C. M. Christensen "Guba reported very heavy infection in Virginia, Minnesota. These specimens were checked by isolations by the Dutch Elm Disease Laboratory and found to be Cephalosporium. Stewart sent in numerous specimens from Duluth from which I isolated the fungus." In Michigan, F. C. Strong reported "No extensive survey made this past year. About the usual number of cases suspected have proved positive."

Gloeosporium ulmi, anthracnose, was less prevalent on U. americana in Michigan than in 1938. It did not injure the leaves appreciably. Also observed in Oklahoma on this same host. In Minnesota, Christensen reported that "On U. americana anthracnose was found wherever it was looked for - Itasca, University Farm, Rochester - but it did not injure the leaves appreciably. On U. pumila (Chinese elm) comparatively few specimens were received. It was found at University Farm, Hastings, and a few other places and infection was doubtless general but light."

Gnomonia ulmea, black leaf spot. No cases of severe defoliation were reported by tree wardens or observed by scouts in Massachusetts. O. A. Reinking reported specimens received from Liberty and Rochester, New York. Oklahoma, in Blaine and Payne Counties (PDR 23:246). Less prevalent in Michigan than in 1938. "Periods of infection apparently too dry for primary and secondary infections of importance." It was observed in Wisconsin and Nebraska.

Heterodera marioni, root knot nematode, was reported in Monterey County, California, by C. E, Scott.

Nectria sp., canker, In Massachusetts, W. H. Davis reported two cases observed in cemeteries in Amherst on Camperdown elms. N. cinnabarina was found in Pierce County, Washington.

Phoradendron flavescens, mistletoe. Texas.

Phyllosticta spp., leaf spots, were reported less prevalent in Massachusetts than for several previous years.

Phymatotrichum omnivorum, root rot, in Texas was unusually destructive on U. americana this spring and summer in the root-rot nursery in Bryan, according to W. N. Ezekiel. McLennan and Bell Counties reported 25 percent loss.

Sphaeropsis ulmicola, canker, has been nearly eliminated by roguing from nurseries in Wisconsin, according to R. E. Vaughan. The usual prevalence was observed in Massachusetts.

Vermicularia sp. was reported in Massachusetts by McKenzie, in tissue plantings from wilted elms.

Verticillium sp., wilt. E. G. Kelsheimer and C. May (PDR 24:282-284) report that Verticillium has been isolated from elm specimens submitted from 33 States, extending from Oregon eastward to Maine and from Minnesota south to Louisiana. McKenzie reported affected elms were found in 69 towns in Massachusetts up to December 31, 1939. No intensive survey was made this year in Michigan. About the usual number of cases suspected have proved positive (F.C.Strong). Less wilt in nurseries but more showing up in city plantings in Wisconsin, according to R. E. Vaughan.

Phloem necrosis (virus) -- 1939. Although no systematic survey has been undertaken, the known distribution of elm phloem necrosis (virus) now includes the southern halves of Ohio, Indiana, and Illinois; southeastern Missouri; northwestern Tennessee; Kentucky; and the western half of West Virginia. The disease has been found generally distributed in this area on wild and planted American elms (Ulmus americana) and some of its varieties. Losses from the disease did not diminish during 1939; epidemic outbreaks of the disease continued in many urban and rural localities and attained epidemic proportions in additional localities of the area. (Roger U. Swingle, Division of Forest Pathology, Bureau of Plant Industry). J. G. Leach reported thousands of trees killed in the Ohio Valley and the western part of West Virginia. (PDR 23:300).

Stag-head (? infectious chlorosis). The New Jersey State Department of Plant Pathology reported as follows: "During the past season several elms were examined which showed sparse, yellowed foliage and a considerable number of stag-heads. These trees showed no symptoms typical of the known fungus diseases of elms and resembled those described for the virus disease known as "infectious chlorosis." The work of determining the cause of the trouble was turned over to Dr. Curtis May of the U. S. Department of Agriculture Laboratory, Morristown.

Blight caused by a yellow bacterial organism was reported on U. parvifolia by E. W. Mendenhall in Ohio, with the comment, "This seems to be a new disease on Chinese elm. The disease is found in a small nursery near Columbus. Cultures were made and in all instances have obtained a yellow bacterial organism. No disease like this has been reported on Chinese elms."

CONIFERS

NURSERY DISEASES IN CENTRAL AND UPPER MISSISSIPPI VALLEY, 1939:

The damping-off of conifers was erratic. Of the pines grown, western yellow pine (Pinus ponderosa) appeared to be the species most resistant to damping-off while red pine (Pinus resinosa) appeared to be most susceptible in nurseries of the upper Mississippi Valley. Alkaline sand used for covering the seed has aggravated this disease problem in all nurseries where such sand was used.

The cedar blight disease caused by the fungus Phomopsis juniperovora reached epidemic proportions in 1939 in Iowa and Minnesota nurseries. Infection at the Iowa nurseries was 100 percent while at the Minnesota nursery the extent of infection was over 70 percent.

The two principal rusts (Gymnosporangium juniperi-virginianae and G. globosum) of Juniperus species were widely prevalent in all parts of the central and upper Mississippi Valley on "wildling" trees as well as on nursery stock over two years of age. (George G. Young, Division of Forest Pathology, Bureau of Plant Industry, in cooperation with Civilian Conservation Corps).

ABIES spp., FIR:

Adelopus balsamicola, Melampsorella cerastii, and Pucciniastrum goeppertianum, on A. lasiocarpa. Grand Teton National Park, Wyoming (W.G.Solheim).

Nectria sp., canker, was reported in Massachusetts on A. balsamea and A. concolor by McKenzie.

Rehmiellopsis bohemica, needle blight, according to McKenzie, occurs very seriously on A. concolor annually in one plantation in Massachusetts. For distribution of needle blight on balsam fir in Maine, see PDR 24:201-205.

Leaf cast caused by an undetermined fungus was reported in Cowlitz County, Washington.

Weather injury: The New Jersey Department of Plant Pathology reported many plantings of fir revealed injury caused by the excessively wet season of 1938 followed by the low temperatures at Thanksgiving time. Winter injury was reported in Washington in Pierce County.

CUPRESSUS spp., CYPRESS:

Coryneum cardinale, canker, is destroying the Monterey cypress in California and some type of interior cypress is being sought which will withstand the disease. The canker began to work on the Monterey cypress about 15 years ago and has completely removed it from many sections of the State.

JUNIPERUS spp., JUNIPER, RED CEDAR:

Cyanospora albicedrae, stem whitening. Texas, on J. mexicana.

Gymnosporangium sp., rust. Oklahoma, on J. monosperma.

G. betheli, rust. Oklahoma on J. scopulorum (PDR 23:127).

G. clavariaeforme, rust. Wyoming, on J. communis depressa.

G. clavipes, quince rust, was more prevalent than usual in Massachusetts. Also reported in New York, Oklahoma, and Illinois (PDR 23:189).

G. exiguum, rust. Oklahoma, on J. mexicana.

G. floriforme, rust. Oklahoma.

G. globosum, hawthorn rust. Oklahoma. In Michigan according to F. C. Strong, "This disease as well as cedar-apple rust is building up in abundance in various landscape set-ups in cities, cemeteries, and parks as well as private properties, because of improper information on landscaping."

G. juniperinum, rust. Wyoming, on J. communis-depressa.

G. juniperi-virginianae, cedar rust, was prevalent on many junipers in New Jersey. Virginia. Oklahoma on J. chinensis (PDR 23:127). In Michigan, F. C. Strong reported, "Like cedar-hawthorn rust, this rust builds up to serious abundance in a few years where landscape plantings include both host groups." Less prevalent in Wisconsin than in 1938. Iowa estimated a total loss of 4 percent -- much more prevalent than for several previous years. Less prevalent in Kansas than for several previous years.

G. nelsoni, rust. Wyoming.

Phomopsis juniperovora, blight. Glenn G. Hahn reported on cedar blight in 1939 (PDR 24:57-58). According to the State Department of Plant Pathology in New Jersey, juniper blight was more severe than usual. Many young seedlings showed brown needles on 5 to 100 percent of the foliage. Oklahoma. In Ohio common occurrence was reported on various junipers in nurseries. The damage is severe in some cases, and the plants are rendered unsightly. (O.T.Wilson). Forrest C. Strong reported more cases observed and sent in to Michigan State College this year than in previous years. According to R. E. Vaughan nursery trees around Milwaukee, Wisconsin were badly affected. Bordeaux spray was beneficial. G. Y. Young reported a loss of 96 percent in nursery stock in Iowa. Low temperatures were favorable to the disease.

Pitya cupressi, associated with dieback, was present in Washington, but a causal relation was not certain.

Sphaeropsis sp., canker. Oklahoma, on J. virginiana.

Winter injury. The New Jersey Department of Plant Pathology reported, "Many of our junipers and other evergreens are still showing the effects of winter injury. This type of injury was more pronounced than usual because of the excessively wet period during the summer of 1938, followed by the extremely cold weather near Thanksgiving.

PICEA spp. SPRUCE:

Cytospora sp., canker. Massachusetts. It was reported on several specimens of spruce in New Jersey. C. M. Christensen reported canker on P. pungens in Minnesota. Specimens were sent in from Aitken, Rochester, and Northfield. He found it in St. Paul at several places, including University Farm, Como Park, Lake Vadnais; and in Minneapolis, Owatonna, and Rochester. Many old trees were killed and many young ones infected.

Fomes annosus, wood-decay. New Jersey.

Melampsora cassandrae, needle rust. Wisconsin. According to C. M. Christensen in Minnesota, 10 to 80 percent of this year's needles were infected and killed. There was considerable injury to Christmas stock near Cass Lake, but no reports of trees being killed.

Drought caused the needles to fall in New Hampshire.

PINUS spp. PINE:

Atropellis piniphila, canker, was observed in Arizona and New Mexico on P. ponderosa. In New Mexico the disease was fairly common in several localities in the Lincoln National Forest, while in Arizona it was observed only in the Graham Mountains in the Crook National Forest (PDR 23:341).

Capnodium sp., sooty mold. Massachusetts, on P. strobus.

Coleosporium solidaginis, rust, on P. resinosa in New York and New Jersey. Rankin in Pennsylvania reported 2/3 of trees in one 4000-tree planting in Erie County affected.

Cronartium cerebrum, oak-rust. Wisconsin, on P. banksiana. C. comptoniae, rust. New Jersey. C. harknessii, western gall rust. Washington, on P. ponderosa. C. quercuum, oak-pine rust. Virginia.

C. ribicola, white pine blister rust. Spread of white pine blister rust during the calendar year 1939, with table showing counties in which blister rust was found for the first time in 1939 on white pines or Ribes is given in Reporter 24: 31-34.

Elytroderma deformans, leaf cast. Washington, on western yellow pine, P. ponderosa.

Lophodermium pinastri, leaf cast. New Hampshire and New Jersey.

Lycogala epidendrum. Camp Elizabeth Furnace, George Washington National Forest, Virginia.

Polyporus volvatus, on P. contorta. Wyoming.

Pythium and Rhizoctonia, damping-off. Wisconsin, more in Trout Lake nursery where rains were abundant.

Sphaeropsis sp., blight. New Jersey. Pine tip die-back caused by S. ellisii was found in Lincoln, Nebraska during the winter of 1938-39 on P. sylvestris and P. nigra austriaca. It is believed that this is the first report of the occurrence of this disease in Nebraska (PDR 23:126).

Drought injury. In New Jersey, many Scotch pine (P. sylvestris) trees showed the effects of the hot dry weather. Many of them lost their needles (New Jersey Dept. of Plant Pathology).

PSEUDOTSUGA TAXIFOLIA. DOUGLAS FIR:

Dasyscypha sp., needle cast, and Dasyscypha sp., canker, were reported by the Washington State Department of Plant Pathology at Mt. Misery in the Blue Mountains.

Hypodermella nervisequia ?, leaf cast. Washington in Asotin County.

Phaeocryptopus gäumanni is apparently widespread in the northern part of Connecticut, but has not been located in the southern part. The first definite determination was made in 1938 (PDR 23:368-369).

Razoumofskya sp., dwarf mistletoe. Washington.

Rhabdocline pseudotsugae, needle cast. Less prevalent than for several previous years in Massachusetts. Also reported from Arizona and Washington.

Leaf scorch and blight (non-parasitic), Washington.

TAXUS spp. YEW:

Dieback. During the past spring numerous young yews (Taxus cuspidata) were observed to be dying in several New Jersey nurseries. In most instances the dieback was most prevalent in low, poorly drained spots. The root systems were completely decayed; in some instances the decayed portion extended into the main stem above the soil level. Isolations from freshly decayed roots and from the discolored portions in the main stems consistently yield 2 distinct fungi: one definitely a species of Fusarium and the other apparently a Phycomycete. (New Jersey State Department of Plant Pathology).

Fasciation or witches' broom was reported from Benton County, Oregon by S. M. Zeller. Apparently this is the first report on western yew.

Weather injury. In New Jersey many plantings of Taxus revealed injury caused by the excessively wet season of 1938 followed by the low temperatures at Thanksgiving time. (State Department of Plant Pathology). New York reported some winter injury.

THUJA spp. ARBORVITAE:

Armillaria mellea, root rot. Texas.

Pestalozzia (Pestalotia) funerea, limb blight. Bell County, Texas; Washington, in Pierce County on T. plicata.

Phymatotrichum omnivorum, root rot. Texas, on T. orientalis.

Blight and dieback (undetermined). Washington, in Lincoln and Spokane Counties.

Chlorosis (non-parasitic). Bell County, Texas.

TSUGA spp., HEMLOCK:

Pucciniastrum myrtilli, needle rust. Washington, in Asotin County. New Jersey on T. canadensis.

Many hemlocks in New Jersey showed effects of the hot dry period, while others revealed poor growth caused mainly by poorly drained soil.

DISEASES OF ORNAMENTAL AND MISCELLANEOUS PLANTS

Diseases of perennial plants, such as trees and ornamental shrubs, were more noticeable in 1939 in Rhode Island following damage from the hurricane of 1938. Fungi generally considered to be saprophytes, such as species of Nectria and Schizophyllum, were able to kill ornamentals because of their weakened condition (Rhode Island Agr. Exp. Stat. Ann. Rpt. 52 (1939): 38. 1940).

ABUTILON THEOPHRASTI. VELVET LEAF:

Rhizoctonia bataticola, charcoal rot. Illinois (PDR 23:312-321).

ACALYPHA OSTRYAEFOLIA. COPPERLEAF:

Cercospora acalyphae, leaf spot. Oklahoma.

AGERATUM sp. AGERATUM:

Sclerotium delphinii, crown rot. New Jersey, "Flowers completely dead, stems and roots dry and brown."

AGOSERIS AURANTIACA:

Puccinia hieracii and P. suksdorfii, rusts, were collected in Carbon County, Wyoming by W. G. Solheim. P. extensicola grossulariata, rust, on A. glauca was also found in Wyoming, in Teton County by Solheim.

ALTHAEA ROSEA. HOLLYHOCK:

Cercospora althaeina, leaf spot. In Michigan, according to Ray Nelson, this was as usual the most prevalent leaf spot on hollyhock. Evidence indicated seed dissemination. Only one report of a very heavy infection in Minnesota (L. Dosdall).

Heterodera marioni, root knot nematode. Oklahoma.

Phytomonas tumefaciens, hairy root, was reported from Wisconsin for the first time on this host by R. E. Vaughan, who stated that it was found on all plants in one garden in Madison.

Puccinia heterospora, rust. One report from Texas. P. malvacearum, rust, was observed in New York and New Jersey. Ray Nelson reported this rust less prevalent than usual in Michigan. Usually it is present in all plantings, but was less general in 1939. Also reported less prevalent in Wisconsin. Washington.

AMARANTHUS RETROFLEXUS. GREEN AMARANTH, PIGWEED:

Albugo bliti, white rust. Oklahoma.

Phyllosticta sp., leaf spot. Texas.

AMBROSIA TRIFIDA. GREAT RAGWEED:

In Oklahoma the following diseases were reported by W. W. Ray: Cercospora sp., leaf spot, Puccinia xanthii, rust, and Cuscuta sp., dodder.

AMELANCHIER sp., JUNEBERRY:

Gymnosporangium sp., rust, was reported from Massachusetts and Minnesota.

AMORPHA FRUTICOSA. INDIGOBUSH:

Cylindrosporium sp., leaf spot, was reported in the Upper Mississippi Valley by George Y. Young.

AMPHICARPA BRACTEATA. HOG PEANUT:

Synchytrium decipiens. George Washington National Forest, Virginia.

ANTIRRHINUM MAJUS. SNAPDRAGON:

Botrytis sp., leaf and stem rust, was more prevalent than for several previous years in Pennsylvania (R.S.Kirby).

Colletotrichum antirrhini, anthracnose, in Pennsylvania caused a trace loss in both greenhouse and field, according to Kirby.

Cuscuta sp., dodder. Washington.

Heterodera marioni, root knot nematode. Oklahoma, "In the greenhouse -- our expensive snapdragons are among the most highly susceptible hosts of the nématode." (K.S.Chester).

Peronospora antirrhini, downy mildew, did serious damage to young nursery stock in Alameda and Santa Clara Counties, California, according to M. R. Harris.

Phyllosticta antirrhini, blight. Washington, in Spokane County.

Phytophthora cactorum, wilt. A.W. Dimock reported the usual prevalence on greenhouse plants in New York. In California, M. R. Harris reported root rot in Glenn, Los Angeles and Sonoma Counties.

Puccinia antirrhini, rust, was reported less prevalent in Massachusetts, Wisconsin, and Kansas. Other States reported the usual prevalence.

Pythium sp., root and stem rot. Texas.

Sclerotinia sp., stem rot, caused a trace loss in Pennsylvania, according to R. S. Kirby. S. delphinii, crown rot, was reported from New Jersey.

Verticillium sp., wilt. New York. Severe in greenhouses around Philadelphia, Pennsylvania, according to R. S. Kirby. V. albo-atrum was reported by L. Dosdall in Minnesota in one greenhouse. "Snapdragon transplants had been put into a bench after a heavily infected Chrysanthemum crop had been removed and the soil treated with mercuric chloride. One percent of the snapdragons were infected."

Ringspot (virus) was reported by K. S. Chester as general in a yellow variety "Ceylon Court" at Stillwater, Oklahoma. "The disease was not so severe as reported for tobacco ring spot on snapdragons, i.e., there was no general necrosis, but otherwise the disease was very similar to that figured by Smith (Plant Virus Diseases, p.267, fig. 42C)."

Tip blight (non-parasitic). Oklahoma in Oklahoma County.

AQUILEGIA spp. COLUMBINE:

Sclerotium delphinii, crown rot, of columbine was reported from several sources in New Jersey.

Puccinia rubigo-vera, rust, was collected on A. caerulea, Colorado columbine, by W. G. Solheim in Wyoming.

ARABIS sp. ROCKCRESS:

Puccinia monoica, rust. Washington in Spokane County.

ARENARIA CONGESTA. BALLHEAD SANDWORT:

Puccinia tardissima, rust, was collected in Teton County, Wyoming by W. G. Solheim.

ARISAEMA DRACONTIUM. DRAGONROOT:

Uromyces caladii, rust. Oklahoma.

ASTER spp. ASTER:

Ovularia asteris Solheim was collected on A. engelmanni by W. G. Solheim in the Teton National Forest, Wyoming.

Phymatotrichum omnivorum, root rot. Texas.

Puccinia extensicola asteris, rust, was collected in Wyoming by W. G. Solheim on Aster sp., A. foliaceus var. apricus? and A. foliaceus var. canbyi.

Ramularia asteris was collected on A. fremontii in Teton National Forest, Wyoming by W. G. Solheim.

ASTRAGALUS spp. MILK VETCH:

Physalospora astragali was collected on A. bisulcatus and A. goniatus in Fremont County, Wyoming by W. G. Solheim.

Thecaphora deformans, smut, was also collected on A. bisulcatus by W. G. Solheim. First report from Wyoming on this host to the Survey.

ATRIPLEX CORRUGATA. SALTBUSH:

Uromyces shearianus, rust, was collected at Alkali Lake, west of Laramie, Wyoming by W. G. Solheim.

AUCUBA sp. AUCUBA:

Verticillium sp., wilt, was found on aucuba in New Jersey during September.

AZALEA spp., AZALEA:

Exobasidium burtii. New Jersey. E. vaccinii, gall. New Jersey, Pennsylvania and California.

Ovulinia azaleae, blossom blight, in Louisiana, according to A. G. Plakidas was more prevalent during the blooming period owing to the wet weather.

Rhizoctonia sp., stem rot, was prevalent in some gardens in New Jersey.

Septoria azaleae, leaf scorch, is always very destructive in greenhouses in New Jersey during the winter months. (State Department of Plant Pathology).

Sporocybe azaleae, bud blight. In Massachusetts some species were reported a total loss, while others were resistant.

Cutting rot. A destructive cutting rot of azaleas in New Jersey has been under investigation. One grower lost nearly 150,000 cuttings because of the trouble. All tissue cultures of diseased stems have constantly yielded the same fungus. (State Department of Plant Pathology).

Dieback caused by excess salts was reported in King County, Washington.

BACCHARIS NEGLECTA. LINEAR-LEAVED BACCHARIS:

Phymatotrichum omnivorum, root rot. Texas. First report on this species (W. N. Ezekiel).

BALSAMORHIZA SAGITTATA. ARROWLEAF BALSAMROOT:

Puccinia balsamorhizae, rust, was collected in Grand Teton National Park, Wyoming, July 27, 1939 by W. G. Solheim.

BEGONIA spp. BEGONIA:

Phytomonas begoniae, leaf spot, in California was prevalent at Golden Gate Park, San Francisco, also found in nurseries in San Mateo and Santa Cruz Counties (P. A. Ark).

BELAMCANDA CHINENSIS. BLACKBERRY-LILY:

Heterosporium gracile, leaf spot. Oklahoma, in Payne County.

BERBERIS spp. BARBERRY:

Cumminsiella sanguinea, rust, was collected on B. aquifolium in the Grand Teton National Park, Wyoming by W. G. Solheim.

Phytomonas berberidis, leaf blight. New York.

Verticillium sp., wilt, was reported on Berberis thunbergii, in Massachusetts.

BOERHAVIA ERECTA. SPIDERLING:

Albugo platensis, white rust. Texas.

BRYOPHYLLUM PINNATUM. LIFE PLANT.

Alternaria tenuis, leaf spot. Texas.

BUMELIA LANUGINOSA. FALSE BUCKTHORN:

Phyllosticta bumeliae. Texas.

BUXUS SEMPERVIRENS. BOX:

Macrophoma candollei, leaf blight and canker. Leaf blight was less prevalent in Massachusetts than for several previous years. Canker was present in many hedges in New Jersey. In some instances this organism followed winter injury. The leaf spot disease was also present and in many cases very severe.

Nectria rousselliana, canker, leaf and twig blight. Leaf and twig blight was reported less prevalent in Massachusetts than for several previous years. Canker was present in many plantings of box in New Jersey, also present in New York.

Phyllosticta sp., Leaf-spot, was said by McKenzie to be less prevalent in Massachusetts than for several previous years.

Phymatotrichum omnivorum, root rot. Texas.

Pratylenchus pratensis, meadow nematode. Texas.

Chlorosis (undetermined). Washington.

CALENDULA OFFICINALIS. CALENDULA:

Aster yellows (virus) was reported on calendula growing near asters in Pennsylvania by R. S. Kirby.

CALLICARPA AMERICANA. AMERICAN BEAUTYBERRY:

Mosaic (virus). Texas.

CALLISTEPHUS CHINENSIS. CHINA-ASTER:

Basidiophora entospora, downy mildew, was more prevalent in Florida than for several previous years, according to E. West.

Coleosporium solidaginis, rust. Pennsylvania and Wisconsin.

Fusarium conglutinans callistephi, wilt. In New York, according to A. W. Dimock, in spite of one of the driest summers on record, there was sufficient soil moisture to favor the development of the disease although it was less prevalent than last year. R. S. Kirby reported 25 percent loss in Pennsylvania. Aster wilt was common in many plantings in New Jersey. In Michigan, Ray Nelson said, "I note an increasing amount of wilt in the resistant varieties. In 1939 some plantings of resistant varieties were seriously affected -- as much as 50 to 100 percent infection." R. E. Vaughan reported wilt less prevalent in Wisconsin owing to the use of wilt resistant strains. In Nebraska, R. W. Goss reported Royal, Heart of France, and American Branching not infected. Early Dawn was severely wilted.

Phomopsis callistephi, stem canker, was reported less prevalent in Wisconsin owing to the dry weather.

Phytophthora sp., stem rot. In New Jersey plants died after being potted for several weeks.

Yellows (virus) was reported by S. Dunn in Grafton County, New Hampshire, August 1. In Massachusetts, W. H. Davis reported, "Out of 250 plants, only 12 were lost by this disease. Less was seen in a survey than usual." A. W. Dimock in New York reported the usual prevalence. According to the New Jersey State Department of Plant Pathology aster yellows was common in many plantings. R. S. Kirby in Pennsylvania reported a loss of 10 percent. In Michigan, Ray Nelson reported vectors were abundant and the disease was observed in practically all plantings. R. E. Vaughan in Wisconsin said that yello s was less common than last year owing to the increased use of cloth covered cages by commercial growers.

CALLUNA VULGARIS, HEATHER:

Die-back (undetermined). Washington, in Lewis County.

CAMELLIA JAPONICA. CAMELLIA:

Sclerotinia camelliae, blossom blight, was reported in Alameda County, California by C. E. Scott. This is the first report on camellia from California to the Survey. Chlorosis was observed in New Jersey and leaf spot (non-parasitic) in Washington.

CAMPANULA MEDIUM. CANTERBURY-BELLS:

Sclerotium delphinii, crown rot, was very destructive in one planting of Canterbury-bells in New Jersey (State Dept. Plant Path.).

CAPSELLA BURSA-PASTORIS. SHEPHERD'S PURSE:

Albugo candida, white rust, and Peronospora parasitica, downy mildew, were reported in Oklahoma by K. S. Chester.

CAREX spp. SEDGES:

The following collections were made in Wyoming by W. G. Solheim:

Cintractia subinclusa, smut, on C. rostrata, beaked sedge, in Medicine Bow Mountains. Puccinia atrofusca, rust, on Carex sp., and C. deflexa in Teton County and P. extensicola on C. festivella, ovalhead sedge, in Medicine Bow Mountains, Carbon County.

CERASTIUM ARVENSE. STARRY CERASTIUM:

Melampsorella cerastii, rust, was collected in the Laramie Mountains in Wyoming by W. G. Solheim.

CHENOPODIUM spp. GOOSEFOOT, PIGWEED:

Cercospora chenopodii, leaf spot, was reported on C. hybridum, maple-leaved goosefoot, in Oklahoma by W. W. Ray.

Peronospora effusa, downy mildew, was reported on C. album, lamb's quarters, in Oklahoma by K. S. Chester.

Puccinia aristidae, rust, was collected on C. rubrum, coast blite, at University Stock Farm, Laramie, Wyoming, by W. G. Solheim.

CHOISYA TERNATA. MEXICAN ORANGE:

Chlorosis (undetermined) was reported from Pierce County, Washington, by the State Department of Plant Pathology.

CHRYSANTHEMUM spp. CHRYSANTHEMUM:

Aphelenchoides fragariae, leaf nematode, was reported less prevalent than last year in Connecticut. New York reported much less prevalence than for several previous years owing to the dry weather. It was reported from Washington in Spokane County.

Phymatotrichum omnivorum, root rot, was reported from Texas.

Pratylenchus pratensis, meadow nematode. Texas, 1 report -- trace to 100 percent loss.

Puccinia chrysanthemi, rust. Louisiana.

Rhizoctonia sp., stem rot. Texas, 1 report.

Septoria leaf spot was observed in the greenhouse as well as outdoors in Connecticut. S. chrysanthemella, was reported as much less common in New York than in 1938 owing to the dry weather. In Illinois, this leaf spot was observed on the variety Monument. S. obesa, New Jersey.

Verticillium sp., wilt, was reported on glasshouse plants of C. morifolium in New York. V. albo-atrum is becoming increasingly severe in New Jersey according to the State Department of Plant Pathology. The most susceptible varieties reported in Illinois were Dorothy Turner, Seidewitz and Andrew Schmidt. In Minnesota, L. Dosdale wrote, "The disease was observed only in one greenhouse where a moderate amount of injury occurred on certain varieties."

CIRSIUM ARVENSE. CANADIAN THISTLE:

Puccinia obtegens, rust, was reported from Washington in Kittitas County.

CLEMATIS spp. CLEMATIS, VIRGIN'S BOWER:

Ascochyta sp., stem rot, was reported in New Jersey. The affected plant started to wither at the top, and was soon completely dead according to the State Department of Plant Pathology.

Puccinia rubigo-vera, rust, was collected on C. ligusticifolia in Fremont County, Wyoming by W. G. Solheim.

COLUTEA ARBORESCENS. BLADDER-SENNA:

Ganoderma sp. Oklahoma (PDR 23:371).

CONVOLVULUS ARVENSIS. FIELD BINDWEED:

Puccinia convolvuli, rust. Oklahoma.

CORNUS FLORIDA. FLOWERING DOGWOOD:

Phytophthora cactorum, crown canker, was found for the first time in Massachusetts on June 27, 1939, in Amherst. This fungus was first observed on the western end of Long Island, where it was doing serious damage. This report is the first record of its occurrence outside Long Island (PDR 24:25).

COSMOS spp. COSMOS:

Phomopsis stewartii, stem blight. Only one report from Minnesota (L. Dosdall).

Spotted wilt (virus?). Texas, on C. sulphureus.

CROTON MONANTHOGYNUS. CROTON:

Bubakia crotonis, rust, was reported in Payne County, Oklahoma by W. W. Ray.

CYPERUS ESCULENTUS. EARTH-ALMOND.

Puccinia canaliculata rust, was reported in Oklahoma by W. W. Ray.

CYSTOPTERIS sp., BLADDERFERN:

Hyalopsora polypodii, rust, was collected in Hayden Forest, Carbon County, Wyoming by W. G. Solheim.

DAHLIA spp. DAHLIA:

Entyloma dahliae, smut, was reported in San Francisco County, California by M. R. Harris (PDR 23:346).

Fusarium sp., wilt. Arizona.

Macrosporium sp., wilt, Washington.

Phytomonas solanacearum, brown rot, was reported in Oklahoma by K. S. Chester.

Verticillium albo-atrum, wilt, was very severe in one planting in New Jersey and resulted in the death of some of the plants. (State Department of Plant Pathology).

Mosaic (virus). In Wisconsin, R. E. Vaughan reported the usual prevalence. Some promising new strains were being discarded. Ray Nelson reported the usual amounts in all commercial plantings in Michigan.

Ringspot (probably spotted wilt) (virus), according to Ray Nelson in Michigan was the most common disease on dahlia seen in all commercial plantings.

DELPHINIUM spp. LARKSPUR:

Botrytis sp., root and crown rot, was reported from New York by C. A. Reinking. Blight was less prevalent in Wisconsin owing to the dry weather, according to R. E. Vaughan.

Erwinia aroideae, stalk rot, was common in commercial plantings in Monterey and Marin Counties, California (P. A. Ark).

Erysiphe polygoni, powdery mildew, was less prevalent in New York than for several previous years, according to A. W. Dimock. In Michigan, Ray Nelson reported powdery mildew generally prevalent late in the season on all flowering plants.

Phytomonas delphinii, bacterial leaf spot or black spot. A. W. Dimock reported bacterial spot less prevalent in New York than last year or an average year, owing to the dry weather. The usual prevalence was reported in Wisconsin by R. E. Vaughan. Black spot was reported present in most plantings in Michigan but not serious.

Sclerotium delphinii, crown rot, was reported by Dimock in New York as being much less prevalent than for several previous years, owing to the dry season. The Department of Plant Pathology of New Jersey reported that the crown rot organism caused the death of many plants not only in individual gardens, but among many plantings in nurseries. In Michigan, Ray Nelson reported the disease common in most plantings of hybrid kinds. It was the cause of "decline" in usual plantings of hybrid varieties. M. R. Harris in California reported this organism causing root and stem rot in Alameda County.

Sclerotium rolfsii, crown rot, in Texas caused severe local injury according to one report.

Weather injury. In New Jersey some delphiniums showed yellowing and stunting caused by unfavorable weather conditions (State Department of Plant Pathology).

DIANTHUS CARYOPHYLLUS. CARNATION:

Alternaria dianthi, leaf spot and branch rot. S. J. Dunn reported branch rot in Rochester County, New Hampshire August 25. In New York owing to the dry weather the disease was much less prevalent than for several previous years. R. S. Kirby reported that branch rot caused 10 percent loss in Pennsylvania.

Botrytis spp., blight. Carnations in several plantings in New Jersey were turning brown and dying. When the affected blossoms were exposed to moist conditions, a severe case of botrytis blight became prevalent (State Department of Plant Pathology). In Pennsylvania, R. S. Kirby reported blossom blight caused a trace loss. Bud rot was reported in Washington, in Spokane and Whitman Counties.

Fusarium spp., wilt and stem rot, was reported in New York, Illinois, and Washington.

Heterosporium echinulatum, fairy ring. Washington, in King County.

Phytomonas spp., bacterial wilt, was reported "rather destructive" in Washington. P. woodsii, bacterial leaf spot, was reported by R. S. Kirby as causing a trace loss in Pennsylvania. This is the first report to the Survey from Pennsylvania on this host.

Rhizoctonia sp., stem rot, was observed in New Jersey and Pennsylvania.

Uromyces caryophyllinus, rust, was observed in New Jersey. R. S. Kirby estimated 1 percent loss in Pennsylvania and stated that it was observed all the year round in greenhouses. Rust was reported in 7 counties in Washington by the State Department of Plant Pathology. In California, M. R. Harris and C. E. Scott reported rust in Alameda and Los Angeles Counties.

Breaking of blossoms (probably caused by virus). In Oklahoma, K. S. Chester reported; "This trouble is considered serious on the King Cardinal variety since this has been a dependable solid red carnation. 'Running-out' of carnation varieties is common, suggesting that viruses of a mild type are more prevalent in this host than is generally recognized."

Yellows (virus) was reported in 6 counties in Washington by the State Department of Plant Pathology.

DIODIA TERES. ROUGH BUTTON-WEED:

Uromyces spermacoces, rust, was reported in Payne County, Oklahoma by W. W. Ray.

DODECATHEON PAUCIFLORUM. SHOOTING-STAR:

Puccinia solheimii, rust, was collected in Medicine Bow Mountains, Albany County, Wyoming by W. G. Solheim.

DOLICHOS SPHAEROSPERMUS. HYACINTH-BEAN:

Rhizoctonia sp., damping-off and root rot. Texas.

ELAEAGNUS spp.:

Phymatotrichum omnivorum, root rot, Texas, on silverberry, E. argentea. Puccinia coronata, rust, was collected on russet buffaloberry, E. canadensis, in Teton County, Wyoming by W. G. Solheim.

EPIDENDRUM sp. ORCHID:

Rhizoctonia solani, root rot. Oklahoma.

ERICA sp. HEATH:

Ascochyta sp., stem rot, was very severe in one planting in New Jersey.

ERIGERON spp. FLEABANE:

Puccinia extensicola, rust, was collected on E. salsuginosus, Alaska fleabane, by W. G. Solheim in Medicine Bow Mountains, Albany County, Wyoming.

Rhizoctonia bataticola, charcoal rot, was reported on E. canadensis, in Illinois (PDR 23:312-321).

ERIOGONUM spp., WILD BUCKWHEATS:

Peronospora sp., downy mildew, was reported on E. blissianum in Santa Barbara County, California by C. E. Scott.

Uromyces intricatus, rust, was collected on E. campanulatum in Fremont County, Wyoming by W. G. Solheim.

ERYTHRONIUM GRANDIFLORUM. GLACIERLILY:

Uromyces heterodermus, rust, was reported in Carbon County, Wyoming by W. G. Solheim.

EUONYMUS spp. EUONYMUS:

Exosporium concentricum, leaf spot. Texas, on E. japonica.

Heterodera marioni, root knot nematode. Texas.

Microsphaera sp.,(probably) powdery mildew, was common during the growing season in Arizona, according to J. G. Brown.

Phymatotrichum omnivorum, root rot, caused 10 percent loss in Bell County, Texas.

Phytomonas tumefaciens, crown gall, was reported by S. Dunn on E. fortunei var. radicans, wintercreeper, in New Hampshire. The disease occurred in New York also.

EUPATORIUM sp. EUPATORIUM:

Sclerotium delphinii, crown rot. New Jersey.

EUPHORBIA sp. SPURGE:

Colletotrichum sp., rot. New Jersey. "During the season a severe outbreak of rot on a valuable collection of African succulent Euphorbias was investigated. A species of Colletotrichum was constantly associated with the dieback, especially on E. fimbriata. The disease is apparently most serious in the greenhouse during cloudy winter months and appears to be less destructive during the spring and summer." (New Jersey Department of Plant Pathology).

Erysiphe sp., powdery mildew. New Jersey.

EUPHORBIA spp. POINSETTIA:

Botrytis cinerea, stem canker and dieback. Washington.

Rhizoctonia sp., stem rot. New Jersey.

Stem cracking, possibly caused by the excessive use of nitrates and partly by materials added to plants, was reported from New Jersey.

FREESIA sp. FREESIA:

Fusarium sp., yellows and corm rot, was reported on glasshouse plants in New York.

GARDENIA JASMINOIDES. CAPE-JASMINE:

Heterodera marioni, root knot nematode. Oklahoma.

Phomopsis gardeniae, canker. Massachusetts (PDR 24:58-62). New York, Oklahoma, and Illinois. In Michigan, Ray Nelson reported canker occasionally a serious disease. In a planting of 12,000 plants, 3 percent were affected.

Rhizoctonia, leaf spot. "A new disease of gardenia observed during the past summer, in which the causal organism produced large brown spots on the leaves, is at present confined principally to the new variety, Pride of Daisy Hill. Under greenhouse conditions, the disease was most severe where plants were over-crowded and grown under high humidity. The spots are more numerous on the lower leaves. Isolations from infected leaves yielded a species of Rhizoctonia." (New Jersey Department of Plant Pathology).

GAURA BIENNIS. BIENNIAL GAURA:

Cercospora gaurae, leaf spot. Oklahoma.

GAYOPHYTUM spp.:

Puccinia gayophyti, rust, in Wyoming was collected on G. caesium in Teton County and on G. ramosissimum in Carbon County by W. G. Solheim.

GELSEMIUM SEMPERVIRENS. CAROLINA-JESSAMINE:

Heterodera marioni, root knot. Alameda County, California.

Phymatotrichum omnivorum, root rot. Texas.

GENISTRA sp. BROOM:

Armillaria mellea, root rot, was reported in San Luis Obispo County, California, by C. E. Scott.

GERANIUM spp. WILD GERANIUMS:

Plasmopara geranii, downy mildew, was reported on G. carolinianum in Oklahoma by K. S. Chester.

Puccinia leveillei, rust, was collected on G. fremonti in Teton County, Wyoming, by W. G. Solheim. He also collected Sphaerotheca humuli, mildew, on the same host and in the same county.

GEUM sp., AVENS:

Peronospora potentillae, downy mildew, was reported in San Mateo and Alameda Counties, California, by H. Earl Thomas.

GILIA RUBRA. SPANISH-LARKSPUR:

Pratylenchus pratensis, meadow nematode. One report from a greenhouse in Brazos County, Texas (W. N. Ezekiel).

GLADIOLUS spp. GLADIOLUS:

Botrytis cinerea, leaf spot. A strain of this fungus attacked maturing gladiolus foliage in a field near Portland, Oregon. This is the first record of Botrytis attacking gladiolus foliage in Oregon (PDR 23:347).

Fusarium spp., basal dry rot and yellows. In New York yellows was reported less prevalent than for several years, according to A. W. Dimock. Yellows was more prevalent than usual in Michigan. Ray Nelson estimated 5 percent loss. "This is the most important disease of this plant, being widely distributed and destructive in susceptible varieties. It was most serious in older growing sections." He reported basal dry rot an increasingly important disease in commercial plantings. F. oxysporum gladioli, dry rot, was reported from Illinois by the Illinois Natural History Survey.

Heterodera marioni, root knot nematode. Texas.

Penicillium gladioli, storage rot. In reporting from Minnesota, L. Dosdall said there was only 1 report of the disease in the 1938 crop of corms.

Phytomonas gummisudans, leaf blight, was observed in Illinois, Wisconsin, and Minnesota.

Phytomonas marginata, bacterial scab, was collected in various sections of New York. New Jersey, "Several lots of gladiolus corms showing infection caused by the scab organism were sent to us during the year." (New Jersey Department of Plant Pathology). One report from Texas -- a trace loss was estimated. K. S. Chester remarked that, "Scab was intercepted by the Oklahoma State Nursery Inspector on bulbs en route from Indiana." The Natural History Survey of Illinois reported scab observed on varieties Mildred Louise, Picardy, Mrs. F. C. Hornsburger, and Fairest Pearl. Ray Nelson in Michigan reported scab in all plantings -- causing general loss (3 percent) in storage and grade, but no field losses. Usual prevalence reported in Wisconsin.

Septoria gladioli, hard rot, was reported more prevalent than usual in New Jersey. Illinois reported observations on the varieties Maid of Orleans and Paul Pfitzer. Wisconsin.

Rhizoctonia sp., leaf scale blight. Texas, 5 percent loss.

Sclerotinia gladioli, dry rot. Usual prevalence reported in New York. Ray Nelson reported, "A trace of loss occurred in Michigan where the season was generally too dry, especially at time of corm formation; however, it was serious in young planting stock."

Chlorosis (non-parasitic). Texas.

Mosaic (virus). New Hampshire. Wisconsin, more prevalent than in 1938 -- probably spread by aphids (R. E. Vaughan). Washington.

GONOLOBUS LAEVIS. ANGLE-POD:

Puccinia obliqua, rust. Oklahoma.

HEDERA spp. IVY:

Phyllosticta sp., leaf spot, caused a slight to moderate infection in many plantings in New Jersey (New Jersey Department of Plant Pathology). M. R. Harris reported P. hederaecola on H. helix, English ivy in Marin County, California.

Phytomonas hederae, bacterial leaf spot. The usual prevalence was reported in New York. Washington, in Spokane County on dwarf ivy.

HEDYSARUM MARGINATUM. UTAH SWEETVETCH:

Uromyces hedysari-obscuri, rust, was collected in Teton County, Wyoming, by W. G. Solheim.

HELIANTHELLA UNIFLORA. LITTLE SUNFLOWER:

Puccinia helianthellae, rust, was collected on Signal Mountain, Jackson Hole, Teton County, Wyoming, by W. G. Solheim.

HELIANTHUS spp., SUNFLOWER:

Cercospora pachypus, leaf spot, and Cuscuta sp., dodder, were reported from Oklahoma.

Erysiphe cichoracearum, powdery mildew, was reported less prevalent in Wisconsin owing to the dry weather. J. J. Christensen in Minnesota reported the usual prevalence.

Puccinia helianthi, rust, was observed in New Jersey, Texas, Oklahoma, Wisconsin, and Minnesota.

Sclerotinia sclerotiorum, stem rot and Septoria helianthi, leaf spot, were reported from Minnesota by J. J. Christensen.

HERACLEUM LANATUM. COW PARSNIP:

Ramularia heraclei, leaf spot, was collected in Grand Teton National Park, Wyoming by W. G. Solheim.

HIBISCUS spp. ROSE-MALLOWS:

Cercospora sp., leaf spot, was reported in Oklahoma on H. rosa-sinensis by W. W. Ray.

Choanephora sp. was reported on faded fallen blossoms in Georgia (PDR 23:293).

Colletotrichum hibisci, anthracnose. Texas.

Phymatotrichum omnivorum, root rot. On H. syriacus, Texas, in Bell County, and severe damage in Bryan and Brazos Counties.

HIERACIUM SCOULERI. WOOLYWEED:

Puccinia extensicola hieraciata and P. hieracii, rusts, were collected in Wyoming, Lincoln, and Teton Counties, respectively, by W. G. Solheim.

HYDRANGEA sp. HYDRANGEA:

Alternaria sp., leaf spot. New Jersey.

Cercospora arborescentis, leaf spot, on H. arborescens in Oklahoma (W. W. Ray).

Microsphaera polonica, powdery mildew, was reported in Spokane and King Counties, Washington by the State Department of Plant Pathology. First report to the Survey on this host.

Oidium sp., powdery mildew, was reported common throughout New Jersey.

Sclerotium rolfsii, southern blight, was reported in Bowie County, Texas. First report on this host to the Survey.

HYDROPHYLLUM CAPITATUM. WATERLEAF:

Puccinia rubigo-vera apocrypta, rust, was collected in Teton National Forest, Teton County, Wyoming by W. G. Solheim.

HYMENOCALLIS OCCIDENTALIS, WESTERN SPIDERLILY:

Cercospora sp., leaf spot. Texas.

IPOMOEA spp., MORNING GLORY:

Albugo ipomoeae-panduranae, white rust, was reported in Oklahoma on I. hederacea and I. pandurata. Also found in DeKalb County, Texas.

Choanephora conjuncta was reported in Georgia on faded fallen blossoms (PDR 23:293).

Heterodera marioni, root knot nematode, was reported on I. purpurea in Oklahoma by K. S. Chester. First report on this host to the Survey.

IRIS sp. IRIS:

Didymellina macrospora (Heterosporium gracile), leaf spot, was reported from Massachusetts, New York, Michigan, and Wisconsin as less prevalent than last year owing to the dry weather. It was observed in Oklahoma and Washington.

Erwinia carotovora, soft rot, was reported from Massachusetts, New Jersey, Texas, and Wisconsin.

Fusarium sp., root rot, occurred on I. kaempferi, Japanese iris, in New Jersey and Washington.

Phytomonas tardicrescens, bacterial blight, according to Boyd was less prevalent than for several previous years in Massachusetts owing to the dry weather.

Puccinia iridis, rust, was reported in Florida on Spanish and Tangiers Iris by E. West. M. R. Harris reported it in San Francisco County, California.

Sclerotinia convoluta, botrytis crown rot, in Minnesota was observed only in experimental plots. The fungus was still active as late as June 24. The weather was cool and wet up to this time (L. Dosdall).

Sclerotium rolfsii, southern blight, was less prevalent than for several previous years in Florida. Bulbs infected in the field continued to rot in the curing boxes (E. West).

Mosaic (virus) was reported in New Jersey and Washington.

JATROPHA STIMULOSA. SPURGE NETTLE:

White mottling of leaves (virus). Texas.

JUSSIAEA DECURRENS:

Alternaria sp., leaf spot. Oklahoma.

KALMIA LATIFOLIA. MOUNTAIN LAUREL:

Phyllosticta kalmicola, leaf spot, was common on many laurels. This disease is generally more severe following a season of excessive rainfall. (New Jersey Department of Plant Pathology).

"Dieback of mountain laurel was observed in New Jersey. The plants were killed outright, giving the appearance of having been burned by fire. All the stems examined showed abundant fruiting of the basidiomycete, Fomes annosus, at the ground level. The fungus was identified by Dr. L.O. Overholts of Pennsylvania State College. This fungus has been reported as a parasite of several species of conifers, but there is no previous report of its presence on mountain laurel." (New Jersey Department of Plant Pathology).

Weather injury. In New Jersey many plantings of mountain laurel revealed injury caused by the excessively wet season of 1938 followed by the low temperatures at Thanksgiving time (New Jersey Department of Plant Pathology).

LACTUCA spp. LETTUCE:

Rhizoctonia bataticola, charcoal rot, was reported on L. serriola, prickly lettuce, in Illinois (PDR 23:312-321).

Septoria lactucicola, leaf spot, was observed on L. canadensis, wild lettuce, in Oklahoma.

LAMIUM AMPLEXICAULE. HENBIT:

Peronospora lamii, downy mildew, Bell County, Texas.

LANTANA spp. LANTANA:

Phymatotrichum omnivorum, root rot, was reported from Texas in the root rot nursery on L. camara and L. sellowiana.

LATHYRUS ODORATUS. SWEET PEA:

Phytomonas fascians, fasciation, was observed in greenhouses in Oklahoma.

Thielaviopsis basicola, root rot, was less prevalent than usual in New York owing to the low moisture content of the soil.

Mosaic (virus). New York.

LIGUSTRUM spp., PRIVET:

Glomerella cingulata, anthracnose. Oklahoma, in Payne County. Canker and blight probably caused by this organism was reported in Kansas by C. H. Elmer.

Heterodera marioni, root knot nematode, was common on this much planted hedge shrub in Arizona. Nursery stock was often responsible (J. G. Brown). There was one report from Texas on L. lucidum compactum.

Nectria cinnabarina, on L. amurense, amur privet, caused a trace loss in Pennsylvania, according to Rankin.

Phymatotrichum omnivorum, root rot, was reported in Texas on L. amurense, L. lucidum compactum and Ligustrum sp. Some severe damage was caused in Bexar and Brazos Counties.

Phytomonas tumefaciens, crown gall. Texas, one report on L. lucidum compactum in Texas.

Chlorosis (non-parasitic). Bell County, Texas.

LILIUM spp., LILY:

Botrytis sp., stem rot, was reported less prevalent in Wisconsin this year owing to the dry weather. Blight was observed in Pierce County, Texas. B. cinerea, blight. New Jersey. B. elliptica, blight, in Michigan occurred on Madonna and Regal lilies. It caused defoliation in unsprayed plantings (Ray Nelson).

Phytophthora sp., root rot. Washington.

Mosaic (virus). New Jersey, Wisconsin, and Washington. In Michigan cucumber mosaic was seen in L. sargentiae, L. regale, and L. longiflorum out-of-doors. Also in hybrid varieties (Ray Nelson).

LINUM LEWISII. PRAIRIE FLAX:

Melampsora lini, rust, was collected in Teton National Forest, Teton County, and Burris, Wyoming by W. G. Solheim.

LIPPIA CANESCENS. CREEPING LIPPIA:

Sclerotium rolfsii, brown patch, was reported in Lake County, California by C. E. Scott.

LOMATIUM sp. BISCUITROOT:

Puccinia jonesii, rust, was collected in Grand Teton National Park, Wyoming, by W. G. Solheim.

LONICERA sp., HONEYSUCKLE:

Cercospora antipus, leaf spot, caused 5 percent loss in Bell County, Texas.

Leptothyrium periclymeni was collected in Grand Teton National Park, Wyoming by W. G. Solheim.

MALVA ROTUNDIFOLIA. MALLOW:

Puccinia malvacearum, rust. Oklahoma.

MALVAVISCUS sp. WAXMALLOW:

Sclerotinia sclerotiorum, twig blight. Texas.

MATTHIOLA spp. STOCKS:

Sclerotinia sclerotiorum, stem blight, was collected by M. W. Gardner in California on M. incana. "The disease was causing considerable loss in a commercial field planting grown for cut flowers. Sclerotia are formed in the pith cavity as well as externally." Stem rot was present in Michigan on M. incana annua in most greenhouse plantings in December, January, and February (Ray Nelson).

Blight (undetermined). Washington.

MELIA AZEDARACH. CHINABERRY:

Cercospora meliae, leaf spot, and Phymatotrichum omnivorum, root rot, were reported from Texas.

MENYANTHES TRIFOLIATA, BOGBEAN:

Physoderma menyanthis was collected at Small Lake near the Albany-Carbon County Line, Medicine Bow Mountains, Wyoming by W. G. Solheim.

MONARDA MOLLIS. HAIRY WILDBERGAMOT:

Puccinia menthae, rust. Oklahoma.

MUHLENBERGIA ASPERIFOLIA. SCRATCHGRASS:

Tilletia asperifolia, smut, was collected in Yellowstone National Park, Wyoming by W. G. Solheim. First report on this host from Wyoming to the Survey.

MYRICA spp., WAXMYRTLE:

Rhizoctonia solani, stem rot. The New Jersey Department of Plant Pathology reported that two lots showed severe infection by this organism.

NARCISSUS sp. NARCISSUS:

Fusarium sp., basal rot. Washington, in Pierce County.

Mosaic (virus). Washington.

White streak (virus) (See PDR 24:20-24).

NEPHTHYTIS sp.

Gloeosporium sp., leaf spot. In Florida, Erdman West reported that this seems to be a rather new trouble on a new crop, an ornamental foliage plant.

NERIUM OLEANDER. OLEANDER:

Phytomonas savastanoi, bacterial knot, was reported in Fresno, Madera and Orange Counties, California, by M. R. Harris.

Sphaeropsis sp., witches' broom. New Jersey. E. West reported the disease general over Florida wherever oleanders are grown but more serious near the coast.

NYMPHAEA ODORATA. AMERICAN WATERLILY:

Entyloma nymphaea, leaf smut. Oklahoma.

ORNITHOGALUM AUREUM. STAR-OF-BETHLEHEM:

Mosaic (virus), apparently undescribed. A typical virus-type of mottling, much resembling Hippeastrum mosaic, was found in a greenhouse at Stillwater, Oklahoma (K. S. Chester). First report on this host to the Survey.

OSMANTHUS-AQUIFOLIUM. HOLLY OSMANTHUS:

Rosellinia necatrix, root rot, was reported in Napa County, California by C. E. Scott.

OSMORHIZA spp. SWEET CICELY:

Phleospora osmorrhizae was collected on O. divaricata and O. occidentalis west of Jenny Lake, Grand Teton National Park, Wyoming by W. G. Solheim.

Puccinia pimpinellae, rust, was collected on O. obtusa in the Teton National Forest, Teton County, Wyoming by W. G. Solheim.

OXYTROPIS GRACILIS. CRAZYWEED:

Uromyces lapponicus, rust, was collected in Medicine Bow Mountains, Albany County, Wyoming by W. G. Solheim. First report on this host to the Survey.

PAEONIA spp. PEONY:

Armillaria mellea, root rot, was reported in Napa County, California by M. R. Harris.

Botrytis sp., blight. Climatic conditions were reported very favorable for the development of blight in New Jersey. According to R. E. Vaughan, it was less prevalent in Wisconsin owing to the dry weather.

Cercospora variicolor, leaf spot, caused a trace loss in Iowa (I. E. Melhus).

Cladosporium paeoniae, leaf spot. New Jersey. In Michigan serious spotting of leaves was observed in some plantings (Ray Nelson). In Wisconsin, it was less prevalent than usual. More was seen where old stalks were not removed (R. E. Vaughan).

Heterodera marioni, root knot nematode, in Michigan was troublesome in commercial plantings. Infestation was general in some nurseries on all susceptible varieties (Ray Nelson). Wisconsin.

Phytophthora cactorum, blight. Minnesota.

Sclerotinia sclerotiorum, stem rot, in Illinois, was found only in a home planting. Approximately 5 percent of the plants were infected in this planting. It was not observed in 6 commercial plantings in 6 counties (Illinois Natural History Survey). First report on peony from Illinois to the Survey.

Verticillium albo-atrum, wilt. Illinois (PDR 24:133-134).

Mosaic (virus) was observed affecting all plants of one variety in a local nursery in Michigan (Ray Nelson).

PAPAVER spp. POPPY:

Phytomonas papavericola, bacterial leaf spot, was reported from the Agricultural Experiment Station plot at Geneva, New York. It was also reported from Oregon by Frank P. McWhorter (PDR 23:283). First report of this disease from Oregon to the Survey.

Rhizoctonia solani, stem canker, was observed in New Jersey on Papaver orientale.

PARTHENOCISSUS spp.:

Guignardia bidwellii, black rot, occurred on P. quinquefolia, Virginia creeper, in the Upper Mississippi Valley, according to George Y. Young. It was reported on the same host in Oklahoma by W. W. Ray. McKenzie reported it in Massachusetts on P. tricuspidata, Japanense creeper.

Uncinula sp., powdery mildew, was also reported on Virginia creeper by Young.

PEDICULARIS PAYSONIANA. FERNLEAF:

Puccinia clintonii, rust, was collected in Carbon and Teton Counties, Wyoming by W. G. Solheim.

PELARGONIUM spp. GERANIUM:

Fusarium sp., stem rot or black rot. Washington.

Phytomonas pelargonii, bacterial leaf spot. New York. New Jersey, prevalent in many nurseries.

Rhizoctonia solani, stem rot, cutting rot. New Jersey.

Crinkle (virus), reported last year, has appeared in another North Jersey establishment, at least 20 miles beyond the previous outbreak.

There is no doubt that the disease is transmitted largely through cuttings. The insect vector is as yet unknown. (New Jersey Department of Plant Pathology), PDR 24:129-131. Crinkle was reported from 5 counties in Washington.

Mosaic (virus). Washington.

PETUNIA spp. PETUNIA:

Choanephora conjuncta was reported on faded fallen blossoms in Georgia (PDR 23:293).

Heterodera marioni, root knot nematode, was reported common on this ornamental in Arizona by J. G. Brown.

Rhizoctonia solani, stem rot. New Jersey.

Mosaic (virus). New York. Mosaic (cucumber virus) was very common in Oklahoma (K. S. Chester).

PHILADELPHUS spp. MOCKORANGE:

Phymatotrichum omnivorum, root rot, was reported on P. grandiflorus from Texas, in the root-rot nursery.

Septoria philadelphi, leaf spot, caused a trace loss in Iowa (I. E. Melhus).

PHLOX spp. PHLOX:

Erysiphe cichoracearum, powdery mildew, was reported less prevalent in New York owing to the dry weather. New Jersey.

Phyllosticta sp., leaf spot. Washington.

Puccinia douglasii, rust, was collected on P. glabrata in Laramie County, and Puccinia plumbaria on P. multiflora in Carbon County, Wyoming by W. G. Solheim.

Septoria phlogis, leaf spot, occurred on P. drummondii, in New York.

Verticillium sp., wilt, was reported on P. paniculata in New York by A. W. Dimock. V. albo-atrum was observed in Minnesota only in one small garden. The fungus was isolated (L. Dosdall).

PHOENIX spp., DATE PALM:

Graphiola phoenicis, false smut, was reported on P. canariensis, canary date palm, in Travis County, Texas, and on Phoenix sp., in Ventura County, California.

PHYSALIS sp. GROUND CHERRY:

Entyloma sp., leaf smut. Oklahoma.

PHYTOLACCA AMERICANA. POKEBERRY:

Cercospora flagellaris, leaf spot. Oklahoma.

Mosaic (virus) was reported very common in Oklahoma.

PITTOSPORUM spp. PITTOSPORUM:

Cercospora pittospori, angular leaf spot, was reported in southeastern Louisiana by A. G. Plakidas.

Corticium stevensii, leaf blight. Louisiana, in West Feliciana Parish.

PLANTAGO spp. PLANTAIN:

Sphaerotheca humuli fuliginea, mildew, was collected on P. eriopoda, saline plantain, in Albany County, Wyoming by W. G. Solheim.

Uromyces peckianus, rust, was reported on P. aristata and P. purshii in Oklahoma by K. S. Chester.

PODOPHYLLUM PELTATUM. MAYAPPLE:

Puccinia podophyli, rust. Oklahoma.

POLYGONUM spp. KNOTWEED:

Erysiphe polygoni, powdery mildew, was collected on P. buxiforme in Carbon County, Wyoming by W. G. Solheim.

Melanopsichium austro-americanum, smut, was reported by Dewey Stewart at Arlington Farm, Virginia. Oklahoma, on P. lapathifolium.

Puccinia bistortae, rust, was collected on P. viviparum in Albany County, Wyoming by W. G. Solheim.

POTENTILLA spp. CINQUEFOIL:

The following collections were made by W. G. Solheim in Wyoming: Peronospora potentillae, mildew, on P. gracilis ssp. nuttallii in Carbon County; Phragmidium andersoni, rust, on P. fruticosa in Fremont County; Phragmidium ivesiae, rust, on P. nuttallii in Johnson County, and on P. gracilis and P. gracilis ssp. nuttallii, in Teton County; Phragmidium potentillae, rust, on P. flabelliformis in Fremont County and on P. pensylvanica in Laramie, Wyoming.

PRIMULA sp. PRIMROSE:

Ramularia primulae, leaf spot, was reported in Santa Clara County, California by M. R. Harris.

Root rot, cause unknown. Washington. In New Jersey a severe crown rot of Primula was investigated. A pure culture of a species of Fusarium was obtained.

PYRACANTHA sp. FIRETHORN:

Erwinia amylovora, fire blight, was severe in Oklahoma, according to several reports.

Fusicoccum sp., canker. Oklahoma.

Phymatotrichum omnivorum, root rot, was reported in Bell and McLennan Counties, Texas.

Venturia sp., scab. Washington.

PYROLA SECUNDA. WINTERGREEN:

Pucciniastrum pyrolae, rust, was collected in Albany County, Wyoming, by W. G. Solheim.

PYRRHOPAPPUS CAROLINIANUS. FALSE DANDELION:

Puccinia hieracii, rust. Oklahoma.

RANUNCULUS spp., BUTTERCUP:

Puccinia rubigo-vera, rust, was collected on R. cymbalaria, and R. glaberrimus in Albany County, Wyoming by W. G. Solheim.

Uromyces jonesii, rust, was collected on R. calthaeflorus in Carbon County, Wyoming by W. G. Solheim.

RHODODENDRON spp. RHODODENDRON:

The following leaf spots were reported:

Cercospora rhododendri on R. catawbiense in New Jersey. Lophodermium sp., California. L. rhododendri on R. catawbiense in North Carolina. Pestalotia (Pestalozzia) sp. in a Massachusetts nursery, infection not widespread. P. guepini, New Jersey.

Phytophthora cactorum, canker, occurred in a Massachusetts nursery -- severe injury in close plantings near lilacs. Prevalent in some plantings in New Jersey.

Weather injury. In New Jersey many plantings revealed injury caused by the excessively wet season of 1938 followed by the low temperatures at Thanksgiving time.

RIBES spp. GOOSEBERRY. CURRANT.

Cronartium ribicola, white pine blister rust. See Bureau of Entomology and Plant Quarantine. Spread of white pine blister rust during the calendar year 1939. Reporter 24: 31-34. 1940. With table showing counties in which blister rust was found for the first time on white pines or Ribes in 1939.

ROSA spp. ROSE:

Armillaria mellea, root rot. Washington.

Cercospora rosicola and C. rosigena, leaf spots, were reported from Iowa and Texas respectively.

Coniothyrium wernsdorffiae, brand canker, was intercepted en route from Tyler, Texas to Oklahoma.

Diplocarpon rosae, black spot. New York. Common and severe in New Jersey. Upper Mississippi Valley. Texas. Oklahoma. Illinois. Less conspicuous than usual in Michigan. Seems no longer an important disease in glasshouses (Ray Nelson). Also reported less prevalent in Wisconsin, but said to be more prevalent in Minnesota than usual. Kansas. Washington.

Diplodia sp., dieback. Texas, Smith County.

Gloeosporium sp., cane canker. Texas.

Heterodera marioni, root knot nematode, Texas, Oklahoma, and Arizona.

Leptosphaeria coniothyrium, cane blight, was reported from New Jersey, Pennsylvania, Illinois, and Texas.

Mycosphaerella rosicola, leaf spot. Texas.

Phragmidium spp., rusts, were reported from Wisconsin, Texas, Oklahoma, and Iowa. P. americanum, on R. setigera in Smith County, Texas. P. montivagum on R. nutkana in Fremont County, Wyoming, collected by W. G. Solheim, also on Rosa sp. in Albany County. P. rosae-setigerae occurred in a nursery in central Missouri. The leaves and stems were profusely covered with the aecial stage of the fungus (George Y. Young). P. speciosum, was reported more prevalent in Minnesota than for several previous years.

Phymatotrichum omnivorum, root rot. Texas.

Phytomonas rhizogenes, hairy root. Texas.

P. tumefaciens, crown gall, was reported from New Hampshire, New York, New Jersey, Texas, Wisconsin, and Washington.

Sphaerotheca pannosa, powdery mildew, was collected in New York. In New Jersey it was very common and also very severe on many roses, especially the Crimson Rambler variety. It was prevalent in some greenhouses. (Department of Plant Pathology). Also reported from Texas, Oklahoma, Michigan, Wisconsin, Kansas, and Washington.

Chlorosis (non-parasitic). Texas, 12 percent loss in Bell County.

Dieback (winter injury). Washington.

Mosaic (virus). Texas.

Streak (virus). Texas.

RUMEX sp., DOCK, SORREL:

Ovularia obliqua, leaf spot. Oklahoma.

Septoria rumicis, leaf spot, was collected on R. venosus in Big Horn County, Wyoming by W. G. Solheim.

SAPINDUS DRUMMONDII. WESTERN SOAPBERRY:

Cylindrosporium griseum, leaf spot. Oklahoma.

SARCOBATUS VERMICULATUS. GREASEWOOD:

Puccinia aristidae, rust, was collected in Albany and Carbon Counties, Wyoming by W. G. Solheim.

SENECIO CRUENTUS. CINERARIA:

Verticillium dahliae, wilt, was reported on greenhouse plants in New York.

Mosaic (virus) and streak (virus) were destructive to this crop in a number of glasshouses in Washington. Streak is the more destructive of the two, often causing a loss of 50 percent of the plants (Jones, L. K. Wash. Bull. 384:61. 1939).

SMILACINA RACEMOSA. FALSE SOLOMONSEAL.

Ramularia smilacinae, leaf spot, was collected in Grand Teton National Park, Wyoming by W. G. Solheim.

SMILAX spp. GREENBRIER:

Cercospora smilacina, leaf spot, was reported common on S. bona-nox, saw-brier, in Cherokee County, Texas by P. A. Young.

Phyllosticta smilacis, leaf spot, on S. glauca, cat-brier, in Oklahoma (W.W.Ray).

Puccinia smilacis, rust, was reported on S. bona-nox in Texas and Oklahoma.

SONCHUS OLERACEUS. SOW THISTLE:

Bremia lactucae, downy mildew. Texas.

SPIRAEA spp. SPIRAEA:

Cylindrosporium filipendulae, leaf spot, Iowa. C. spiraeicola was collected on S. lucida in Grand Teton National Park, Wyoming by W. G. Solheim.

Phymatotrichum omnivorum, root rot. Texas.

Chlorosis (non-parasitic). Texas.

STEPHANOMERIA PAUCIFLORA.

Puccinia harknessii, rust, was collected in Fremont County, Wyoming.

STILLINGIA SYLVATICA. QUEEN'S DELIGHT.

Uromyces graminicola, rust. Oklahoma.

SYMPHORICARPOS spp. SNOWBERRY:

Glomerella cingulata, anthracnose, caused 50 percent loss of berries in Massachusetts, according to Davis. Less prevalent in Wisconsin owing to the dry weather (R.E.Vaughan).

Microsphaera sp., powdery mildew. Upper Mississippi Valley.

M. diffusa. Texas, 5 percent loss in Bell County.

Puccinia crandallii, rust, was collected on S. albus in Albany County, Wyoming by W. G. Solheim and J. F. Brenckle, and on S. occidentalis in the same county by C. L. Porter.

Septoria signalensis was collected on S. oreophilus, mountain snowberry, in Teton County, Wyoming by W. G. Solheim. S. symphoricarpi, leaf spot. Washington.

Sphaceloma symphoricarpi, scab, caused heavy fruit infection as well as leaf spotting in Massachusetts, according to O. C. Boyd. First report on this host to the Survey from Massachusetts.

SYRINGA VULGARIS. LILAC:

Microsphaera alni, powdery mildew. In Massachusetts, W. H. Davis stated, "Least seen in years -- very few fruiting bodies." Observations were reported in New York, New Jersey, Texas, Oklahoma, Wisconsin, and Iowa.

Phytomonas sp., twig blight. Washington. P. syringae, bacterial blight. Massachusetts. Upper Mississippi Valley.

Phytophthora sp., tip blight. New Jersey. P. cactorum, canker. A close planting was seriously affected in a nursery in Massachusetts according to McKenzie.

Frost injury. Washington.

TARAXACUM spp. DANDELION:

Erysiphe cichoracearum (?), powdery mildew. Much powdery mildew developed late in the summer in New York, according to Charles Chupp.

Puccinia hieracii, rust, was collected on T. paludosum var. vulgare in Wyoming in Fremont County by W. G. Solheim and at the University of Wyoming campus, Laramie by Charlotte Goodding.

Sphaerotheca castagnei, mildew, was reported causing a trace loss in Connecticut.

TEPHROSIA VIRGINIANA. GOAT'S RUE, DEVIL'S SHOESTRINGS:

Ravenelia epiphylla was collected at Woodstock Tower, Virginia by C. A. Ludwig and determined by J. A. Stevenson.

TEUCRIUM CANADENSE. AMERICAN GERMANDER:

Peronospora sp., downy mildew. Oklahoma.

THALICTRUM OCCIDENTALE. MEADOWRUE:

Puccinia rubigo-vera agropyri, rust, was collected in Teton County, Wyoming by W. G. Solheim and A. Brenckle.

TIGRIDIA sp., TIGERFLOWER:

Mosaic (virus). Washington, in Whatcom County.

TRIGLOCHIN MARITIMA. ARROW GRASS:

Puccinia aristidae, rust, was reported from Laramie, Wyoming by W. G. Solheim.

TRILLIUM sp., TRILLIUM:

Sclerotium delphinii, crown rot, was reported from New Hampshire by Cynthia Wescott. This is the first record of the fungus on trillium in the Survey files (PDR 23:309).

TROLLIUS ALBIFLORUS. GLOBEFLOWER:

Cylindrosporium montenegrinum and Phyllosticta trollii were collected in Medicine Bow Mountains, Albany County, Wyoming by W. G. Solheim.

TULIPA spp., TULIP:

Botrytis tulipae, blight, in New Jersey was reported very severe on some specimens sent to the State Department of Plant Pathology for identification, and in two local gardens. Much less prevalent in New York this year owing to the dry weather (A. W. Dimock). In Michigan, Ray Nelson reported, "Less rain than usual in May and June resulted in reducing prevalence of 'fire' in tulip plantings." Also reported less prevalent in Wisconsin and much less prevalent in Minnesota. Washington, in Whitman County.

Penicillium, mold rot. New York.

Sclerotinia sp., white rot. Washington.

VACCINIUM MEMBRANACEUM. BIG WHORTLEBERRY:

Pucciniastrum goeppertianum and P. myrtilli, rusts, were collected in the Grand Teton National Park, Wyoming by W. G. Solheim.

VERNONIA BALDWINII. BALDWIN IRONWEED:

Cercospora sp., leaf spot. Oklahoma.

VERONICA spp. SPEEDWELL:

Puccinia albulensis, rust, was collected on V. wormskjoldii in Carbon County, Wyoming by W. G. Solheim and J. F. Brenckle.

Septoria veronicae, leaf spot. California.

VIBURNUM spp. VIBURNUM:

Cercospora sp., leaf spot, was reported in the Upper Mississippi Valley by George Y. Young. C. varia, leaf spot, on V. opulus was observed in Oklahoma.

Heterodera marioni, root knot nematode, was reported in two localities in Los Angeles County by M. R. Harris.

Phytomonas viburni, bacterial disease, was reported in the Upper Mississippi Valley by George Y. Young.

Verticillium sp., wilt, has been observed on *V. tinus* in a nursery near Portland, Oregon since 1938 (PDR 24:62).

VIGUIERA MULTIFLORA. SHOWY GOLDENEYE:

Puccinia aemulans, rust, was collected in Teton County, Wyoming by W. G. Solheim.

VIOLA spp., VIOLET:

Cercospora violae, leaf spot, in California was reported severe in several places in San Mateo County -- also occurred in Alameda County (H. Earl Thomas).

Colletotrichum violae-tricoloris, anthracnose, was observed on *V. papilionacea*, butterfly violet, in Oklahoma (K. S. Chester).

Heterodera marioni, root knot nematode. Arizona.

Sclerotium delphinii, crown rot, was reported much less prevalent this year in New York owing to the dry weather.

Sphaceloma violae, scab, was reported from Massachusetts for the first time by O. C. Boyd (PDR 23:346). In Pennsylvania, R. S. Kirby reported 4 percent loss from this fungus.

Sphaerotheca humuli, powdery mildew. Washington.

XANTHIUM sp. COCKLEBUR:

Puccinia xanthii, rust, was reported in Oklahoma by W. W. Ray. In Wyoming, W. G. Solheim made collections in Sheridan County.

YUCCA FILAMENTOSA. YUCCA:

Coniothyrium concentricum, leaf spot. Texas.

ZANTEDESCHIA sp. CALLA LILY:

Erwinia aroideae, soft rot. New Jersey.

Phytophthora cryptogea richardiae, root rot, was the most serious fungus disease affecting calla lilies in New Jersey, according to the State Department of Plant Pathology. Usual prevalence in New York (A. W. Dimock).

Spotted wilt (Lycopersicum virus 3). Washington, in Whitman County.

ZINNIA ELEGANS. ZINNIA:

Erysiphe cichoracearum, powdery mildew, was reported in Texas, Minnesota, and Kansas.

Phymatotrichum omnivorum, root rot. Texas.

Mosaic (virus). Texas.

ZOSTERA MARINA. EELGRASS:

Wasting disease. Some recent observations and reports indicate recovery of eelgrass at various points along the Maine coast. (PDR 24: 116-118).

ZIGADENUS spp:

Puccinia grumosa, rust, was collected on *Z. elegans* and *Uromyces zygadeni*, rust, was collected on *Z. gramineus* in Albany County, Wyoming by W.G. Solheim and C. M. Brown.

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Parris, G. K. A check list of fungi, bacteria, nematodes and viruses occurring in Hawaii, and their hosts, Supplement 121:1-91.

Darker, G. D. A brief host index of some plant pathogens and virus diseases in eastern Asia. Supplement 122:93-123.

Cooke, Wm. Bridge. Preliminary host index to fungi of Mount Shasta, California. Supplement 123:125-133.

Barss, Howard P. Proceedings of the third National Plant Nematode Conference. Supplement 124:135-150.

Maneval, W. E. Some recent records of plant pathogens in Missouri. Supplement 125:151-164. (These are listed alphabetically).

Melchers, L. E. and Alvin E. Lowe. The reaction of sorghum varieties and hybrids to milo disease. Supplement 126:165-175.

Edson, H. A., and Jessie I. Wood. Crop losses from plant diseases in the United States in 1939. Supplement 127:177-209.

Nance, Nellie W. Diseases of plants in the United States in 1939. Supplement 128:210-378.

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ERRATA

On page 254 under Brassica campestris, read Erysiphe polygoni instead of Erysiphe graminis.

On page 278, 2d paragraph from bottom read psyllid instead of pyllid.

On page 283, last paragraph read Aphanomyces euteiches instead of Alphanomyces euteiches.

On page 298 last paragraph delete under phony peach "and in Oklahoma a trace loss." Phony peach was not reported from Oklahoma in 1939.

On page 340 under Fraxinus spp., read Cylindrosporium sp. instead of Clylindrosporium.

On page 351 under Antirrhinum majus, Sclerotinia sp., "S. delphinii" should be read Sclerotium delphinii, not Sclerotinia.