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ADVANTAGES OF IMPROVED FOREST MANAGEMENT INVESTMENTS FOR THE TIMBERLAND OWNER

By
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AUTHORS NOTE

The purpose of this paper is to demonstrate the financial considerations involved in the landowner's forest management investment decisions. It is not intended to be a handbook or manual for making such decisions. The examples are merely illustrative and are based on generalized assumptions as to forest management costs, timber values and yields which would not necessarily apply to the individual's circumstances.

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Introduction

It is important that forest landowners understand that investments in improving the growth and quality of their timberland can be more profitable than most other investments in which they might put their money. However, a study of non-industrial forest landowners in the Georgia Coastal Plain shows that 74.5 percent of the forest landowners interviewed, who controlled 81 percent of the commercial forest land, planned to merely let their trees grow and harvest them when economically feasible. They envisioned no cultural practices to improve the quantity or quality of the timber growth on their land. Only three percent of the forest acreage was controlled by individuals who included in their management plans such cultural practices as replanting cut areas, hardwood control, and thinning.[1] The analytical procedures described in this study, when applied to individual tracts, will show that most timberland owners are losing excellent opportunities to increase their wealth by failing to make a relatively small investment in improving the timber growth and income from their forest land.

The purpose of this study is to present a method by which the timberland owner and his advising forester may evaluate the economic advantages of investments in improved forest practices. It is anticipated that most landowners will be surprised to learn of the potential return obtainable from an investment in one or more practices that will improve the productivity of their timberland.

MARKET POTENTIAL

Economic circumstances today are generally more favorable for investments in Georgia's forest resource than at any time in the past. The forest products industry is expanding its capacity to produce lumber and paper products in the state and the prospects are that by the end of the century the annual industrial demand for timber will be twice that of today. Reflecting this economic development and associated demand, timber prices in the state have been more than keeping up with the inflation of the past decade.

Yet, an economic analysis of Georgia's forest resource potential indicates that the acreage upon which tree planting and natural stand management practices is currently being accomplished is falling about 50 percent short of that annually required to meet a doubling of timber demand.[2] This management shortfall is almost entirely accounted for by the lack of improved forest management activity on the part of non-industrial timberland owners who control over 70 percent of all Georgia commercial forest.

It is apparent then that there is a continuing and growing market readily available to the landowners who recognize the opportunity.

With the exception of some land that is too wet, inaccessible, too steep, or of poor site quality, most land is suitable for profitable timber growth. If the landowner fails to make economically feasible investments in forest practices he is forfeiting an opportunity to protect his personal wealth against the ravages of inflation by establishing a timber asset that will grow at a real economic rate that is at least as high, if not higher, than the rate of return to investments generally in the Nation's economy.

ECONOMIC CONSIDERATIONS

If the landowner can increase his personal wealth by investing his money assets in other than his timberland, economics argues that it is in his self-interest to do so. On the other hand, if an investment in tree planting, natural regeneration or stand improving practices offers a higher rate of return than the landowner's alternative uses of the money, his failure to invest in improving the land's productivity will diminish his personal wealth.

Why, then, does the non-industrial landowner fail to utilize accepted forest cultural practices? Among the more important reasons is that the landowner generally has had no experience with making investments in forest management. Except for soil bank, industry, and some public land plantations, the existing forest is a gift of nature that has grown to its present condition with little if any forest management assistance from man. If the landowner thinks at all about the next crop of his timberland asset, he probably believes that nature will again provide what he sees today and that there is no point in attempting to improve upon nature's bounty. A professional forester would advise him that he is wrong on both counts. At the same time, the forester can point to an emerging body of research findings and field evidence that timberland in the South can be made to be much more productive with forest management than it has been or will be if left to nature.

But how is the landowner to compare the economic advantages of investing the money in forest practices versus its alternative uses? If the landowner is to be truly convinced that a forest investment is economically advantageous for him, it is necessary that he consider specific alternative uses of the money.

FOREST INVESTMENT AND ITS ALTERNATIVES

More often than not, the first time the landowner encounters a requirement to make an investment decision relating to his timberland holdings is immediately prior to or after the sale of timber. Much of the following discussion will be directed at the utilization of the proceeds from a timber sale, but it can also apply to the investment of any funds that the landowner has available for investment.

Although the list of specific alternative uses of the landowner's money is endless, it is possible to classify them by broad economic categories. One general set of alternative uses is the acquisition of financial assets. The timber sale proceeds may be used to build up the landowner's cash balance or the money may be invested in a pass-book savings account, savings certificate, life insurance, corporate preferred stock, common stock, and bond, Savings E Bonds, Treasury bills, notes, and bonds. Another general set of money alternatives would be to invest directly in real capital assets or durable producers' goods. These include real estate, buildings, and equipment used by agriculture, industry, and business. A third general set of alternatives would be to acquire real personal assets or durable consumer goods. The money could be invested in a new home, household furnishings, automobile, boat, or in "collectibles" such as gold, coins, stamps, paintings, diamonds, and so on. Finally, the money could be used to pay off outstanding liabilities against the landowner's existing holdings of real and financial assets.

If the landowner will compare the opportunity to invest in his timberland asset with a number of these specific alternative uses, he will make an interesting discovery. Land with trees on it will share one or more economic attributes with almost any real or financial asset with which he chooses to compare it, including money. Granted, these comparisons will not always favor timberland as the better means for achieving the economic ends served by these common attributes. But its versatility stamps this asset as perhaps the best example of what is meant by wealth.

Money Alternatives

In the best of times, uninvested money does not provide a reasonable alternative because it does

not earn interest. For this reason, it is better for the individual to keep any money in excess of what is required for current expenses in a pass-book savings account rather than in a checking account or cash. But today the rate of interest on this near-money asset has been negative in real economic terms. Even with quarterly or daily compounding of interest, the rate of inflation has exceeded the pass-book rate of interest over the past 12 years. Thus, while the purchasing power of money in a pass-book account has not been depreciating as fast as money under the mattress, nonetheless the holder of this asset has been economically penalized instead of rewarded for his thift.

Of course, today the financial community offers a wide selection of securities for which the money rate of interest will more fully reflect the past and expected rate of inflation. And it is financial assets of this type that will be compared with the forest investment opportunity in the later examples.

Consumer Durable Goods Alternative

The lesson of the past 12 years' economic penalty against holding money or near-money assets is not being lost on the consumer as evidenced by current rush to exchange money for durable goods. Indeed, forestry is indirectly benefitting from the fact that the consumer can justify an investment in a home not merely on the basis of personal need but also because it offers him a hedge against inflation. One of the results of inflation is that it is also encouraging persons aspiring to preserve their wealth to accumulate consumer goods that are more ornamental than useful. In recent years, gold, coins, stamps, paintings, and other "collectibles" have increased in real economic value as their prices have increased even faster than the rate of inflation. For the individual who had the foresight or was simply lucky enough to acquire this kind of consumer asset, it has served not merely as a store of value, it has actually earned real economic interest.

Timberland wealth has much in common with durable goods' consumer wealth. It too is an economically scarce asset, whose real economic value has increased over the past 12 years because land and timber prices have risen faster than the rate of inflation.

For the late comer, there is no assurance that the real price of consumer ornaments will continue to rise in the future. By the same token, it would be unwise to assume that timber prices will continue to rise faster than inflation. If the management shortfall problem has a successful resolution, the economic effect will be to make timber more plentiful twenty-five years from now than it would have been otherwise. Timber prices may no more than keep up with general inflation or may even lag behind. But in this respect, the investor in timberland wealth has an important advantage. Even if the real price of timber does not increase, the landowner can earn real economic interest on his forestry investment because his is a productive investment. As his well-managed timber stand grows in volume so too grows the real value of his timberland asset.

Producer Durable Goods Alternative

Forestry is not, of course, unique in offering the opportunity for direct investment in the productivity in the economy. As an alternative, the landowner might invest his money in the capital assets of industrial, agricultural, and commercial enterprises.

The advantage of a direct investment in timberland's productivity is that it will make the landowner wealthy without any significantly greater commitment than his money. Moreover, by far the largest part of this financial commitment will usually occur in the first year of the forest investment period. The investment is in the forest practices, themselves, not the means by which these practices are undertaken. The landowner is paying for the contracted services of the labor, equipment, and management with which is accomplished the site preparation, planting, timber stand improvement, and other practices. Once the work is done, the forest investment will demand no more of the landowner's personal attention than infrequent communications with his forestry advisor and the keeping of a few records.

Common Stock Alternatives

It is an important advantage that a forest investment requires little of the investor's personal attention. There will be no quarterly earnings reports to review, much less daily market reports of the value of his investment. Nor will there be the constant temptation of a telephone call to get out before it is too late or to switch into something that is really hot. Once a timber stand has been established, there is not much to report about except for the quiet compounding of the annual increments in value.

This advantage is particularly important in a comparison with the alternative of investing the money in a "growth" common stock, which offers the landowner the best financial opportunity for approximating the long-run economic success of his investment in forest practices. Although it is not a direct investment in producer capital, a common stock is an ownership interest in a corporation's productivity and thus can increase in real economic value. But not all common stocks offer an equal prospect of growing real economic value, as the precipitious decline in the average real value of common stocks over the past decade of inflation has shown. A landowner must be discriminating enough to select the right stock in the first place and then be able to resist the temptations of the market not to keep it. Most investors fail on one if not both counts.

Fixed Income Security Alternatives

Another financial alternative is to be found among the fixed income securities, such as government savings bonds, bank savings certificates, corporate bonds and preferred stocks, and Treasury bills, notes, and bonds. Exemplifying this type of security is the hypothetical $1,000 bond used in some of the following examples as the alternative to investing $1,000 in forest practices. This bond is assumed to earn eight percent annually compounded interest with a maturity varying with the length

of the forest investment period of each example. In the tax example, it is assumed that the accumulated interest on the bond would not be subject to income taxation until maturity. Further it can be assumed that the bond is generally marketable and that there is little risk of default on interest or principal. This hypothetical eight percent bond is probably a better medium to long-term investment than the landowner is apt to find from among the real-world offerings of this security.

Length of Forestry Investments Can Vary

Timber produces the maximum return when grown to economic maturity, which may be sometimes after it reaches 30 years of age depending on factors such as the timber product, location, market and other conditions. However, the purpose of this paper is not to point out the returns obtainable over a rotation of 30 years or more. Rather the objective is to demonstrate a procedure that allows the timberland owner and his forester to compare the return from an investment in a bond with the possible return from a forestry investment over the shortest period after which he could recover his investment, and the opportunity for increasing timber growth and owner income by implementing the improved practices recommended by his forester.

Some owners may not be interested in looking forward as much as 30 years to the final harvest and maximum return. For this reason examples used here are limited to the shortest practical period after which the owner could expect to obtain the return on his investment or expect to receive additional income from his forest land.

Costs, Yields and Stumpage Value

Costs, yields and market values shown in the various examples are for illustrative purposes only. They would not necessarily apply to the individual's circumstances. *The reader should use costs, yield tables and market values that apply to his local conditions.*

In the tree planting examples the cost of site preparation and planting is assumed to be $95 per acre. Actual site preparation and planting cost will vary from about $50 to $125 per acre. At the assumed cost of $95 per acre, $1,000 will site prepare and plant 11 acres. For lower or higher per acre site preparation costs, the reader need only divide those costs into $1,000 to ascertain the appropriate acreage for his particular circumstances. From Lenhardt and Clutter it is found that a planted stand of old-field loblolly pine on land of average site quality, i.e. site index 60 at age 25, will produce 2,000 cubic feet or 25 cords per acre from 500 to 600 surviving trees at age 15.[3] A conversion factor of 80 cubic feet per standard cord is used.[4] This yield estimate has not been reduced for the risk of mortality from fire, insects and disease, but neither does it reflect the increased yield which can be achieved by planting genetically improved trees. The seedlings now being planted are genetically improved. There are no yield tables to show how much the yield of these improved trees will exceed that of the unimproved trees which served as the basis for current yield tables. In the timber stand improvement example for slash pine, Bennett estimates the yield of 400 trees per acre for old-field plantations on site index 60 age 25 to be 16.4 cords per acre at age 16.[5] The planted stand yield is reduced by 15% to obtain the estimated natural stand yield of 14 cords per acre. As for the assumed stumpage prices it is important to emphasize that *these are assumed prices for illustrative purposes only.* Actual stumpage prices vary significantly throughout the state depending on many factors such as species, size of timber, average stand per acre, timber quality, location, logging conditions, etc.

Only the effect of the Federal Capital Gains Tax is shown in the examples since it has a favorable bearing on the cost of timber production. The ad valorem tax is not shown because this tax would have to be paid in any event. If the owner invests his money in a bond and not in forestry the ad valorem tax on the land would still have to be paid. Thus for equitable treatment of the comparison between an investment in a bond versus forestry, the ad valorem tax should be applied to both or omitted.

The State Income Tax, the State Intangible Property Tax and the Federal Minimum Tax are all omitted. While they are of concern to the owner they, in most cases, are related to the owner's property and total income which usually derives from other sources as well as forestry.

EXAMPLES OF INVESTMENT RETURN PROCEDURES

The remainder of this paper outlines examples of procedures that an owner and his forester may use in comparing the potential income from a forestry investment with that of an eight percent bond or similar investment. The following examples include most of the primary opportunities for investing in improved forest practices to gain the best return. However, a forest property may also benefit from other investments in improving the land's productivity. Your forester can advise you regarding these investments.

Value of Promptly Planting Timber Sale Areas

As mentioned earlier, a study in Georgia's Coastal Plain shows that approximately 74 percent of forest landowners plan only to let their timberland grow and harvest the timber when it becomes merchantable.[1] They leave it to nature to restock the land with either merchantable or unmerchantable trees. This is an unwise practice. Studies show that about 58 percent of the harvested pine stands in Georgia come back to a mixture of pines and hardwoods or pure hardwoods.[6] This can insure a poor future timber crop. Thus, if an owner clearcuts an area and wants to keep his timberland at its highest level of productivity and gain the maximum return, he would be wise to set aside part of the money from each clearcut timber sale to plant genetically improved trees on the cutover area. Here is an example of a procedure for comparing returns if an owner invests all his timber sale money in a bond versus using part of the timber sale money to plant the cutover area and investing the remainder in a bond.

COMPARISON OF INVESTING ALL OF A TIMBER SALE INCOME IN AN 8% BOND VERSUS USING PART OF THE MONEY TO REPLANT THE CUTOVER AREA AND INVESTING THE REMAINDER OF THE TIMBER SALE INCOME IN AN 8% BOND

Per Acre Averages on the 20 Acre Timber Sale Area

	Pulpwood	Sawtimber
Average Volume Per Acre Sold	4 cords	1,720 board feet
Stumpage Price	$12 per cord	$100 per M board feet
Average Value Received Per Acre	$48 +	$172 = $220 Total × 20 Acres = $4,400
		Less Capital Gain Tax at 25% 440
		Net $3,960

This analysis assumes and compares the following:

—At an average cost of $95 per acre for site preparation and planting, $1,900 would be required to plant the 20 acres cutover in the timber sale.

—A planted stand of 500 loblolly pines per acre on land of average site quality will produce 25 cords per acre at 15 years of age.[3]

—A present stumpage value of $12 per cord. Timber values increase with inflation. The current national rate of inflation is about 9%. During the last 10 years pulpwood prices have increased at a compound rate of about 6.5%.[7] This comparison uses 5% annual rate of inflation for pulpwood stumpage. In 15 years $12 per cord inflates to $24.90 per cord. This analysis does not include an additional 15% to 20% increase in volume expected to be obtained by planting genetically improved trees.

25 cords per acre at time of harvest* of the plantation × 20 acres = 500 cords × $24.90 per cord = $12,450 total gross pulpwood payout.

	All In 8% Bond	$3960 in Planted Pines & 8% Bonds: 20 Acre Pine Plantation		Rest In 8% Bond
Invested Sum	$ 3,960	$ 1,900	($ 3,960)	$2,060
Gross Payout After 15 Years	$12,562	$12,450		$6,535
Less Depletion (Recovery of Capital)	$ 3,960	$ 1,900		$ 2,060
Total Gain	$ 8,602	$10,550		$4,475
Capital Gain Exclusion 60%	-	$ 6,330		$ -
Taxable Gain	$ 8,602	$ 4,220		$4,475
Less Income Tax - 25% Rate	$ 2,150	$ 1,055		$1,119
Balance	$ 6,452	$ 3,165		$3,356
Plus Capital Gain Exclusion	-	$ 6,330		-
Gain After Federal Tax	$ 6,452	$ 9,495		$3,356
Total Payment After Federal Tax	$10,412	$11,395	($16,811)	$5,416
Compounded Rate After Federal Tax	6.7%	12.7%	(10.1%)	6.7%

*15 years is the earliest age at which the stand could be sold. Unless the owner needed the money at that time, foresters would generally recommend that he retain the stand and thin it at age 15-18 to take advantage of its still increasing growth rate and value increase.

In the foregoing example it is important to note that the fully stocked planted pine stand value of $11,395 at age 15 is almost three times the harvested natural stand value of $3,960, part of which, the sawtimber, would have been at least 30 years old when harvested. This emphasizes the real value of growing fully stocked stands of timber.

It is also interesting to note that the owner, by investing $1,900 or 48% of his timber sale income in planting a new stand of trees on the cutover area, would, in 15 years have a planted timber stand value of $11,395 versus the $10,412 value that he would have if he invested 100% of the timber sale income in an 8% bond for the same period.

By investing about one-half of his timber sale income in establishing a new fully stocked stand of genetically improved trees, the owner can look forward to having a future timber stand that will grow into a value three or more times greater than the amount received for the timber just harvested. If left to nature, the area runs a risk of reverting to a poorly stocked or unproductive stand of pine and hardwood that would produce little or no income and be a tax burden.

Advantage of Planting Trees on Unstocked Land

Most landowners have areas of good quality forest land that is devoid of commercial trees or supports such a poor stand that it offers little prospect of producing a future income. Unproductive land is a tax burden and a financial drain on the owner. Unless the owner makes the necessary investment to prepare the site and plant such areas the land will remain in a low or unproductive state and continue to be a burden. In addition, the owner will forego the opportunity to increase his wealth and the excellent return to be obtained from a tree planting investment.

YIELD ON EIGHT PERCENT BOND VERSUS PLANTED PINES
COMPARISON OF RETURN ON $1,000 INVESTMENT
FOR A 15 YEAR PERIOD

This analysis assumes the following:
—The land is already owned by the prospective investor.
—At an average cost of $95 per acre for site preparation and planting, $1,000 would plant 11 acres.
—A planted stand of 500 loblolly pines per acre on land of average site quality will produce 25 cords per acre at 15 years of age.[3]
—A present stumpage value of $12.00 per cord. Timber values increase with inflation. The current national rate of inflation is about 9%. During the last 10 years pulpwood prices have increased at a compound rate of about 6.5%.[7] This comparison uses 5% annual rate of inflation for pulpwood stumpage. In 15 years $12.00 per cord inflates to $24.90 per cord. This analysis does not include an additional 15% to 20% increase in volume expected to be obtained by planting genetically improved trees.

25 cords per acre at time of harvest* of the plantation × 11 acres = 275 cords × $24.90 per cord = $6,848 total gross payout.

	8% Bond	11 Acre Pine Plantation
Invested Sum	$1,000	$1,000
Gross Payout After 15 years	$3,172	$6,848
Less Depletion (Recovery of Capital)	$1,000	$1,000
Total Gain	$2,172	$5,848
Capital Gain Exclusion 60%	-	$3,509
Taxable Gain	$2,172	$2,339
Less Income Tax - 25% rate	$ 543	$ 585
Balance	$1,629	$1,754
Plus Capital Gain Exclusion	-	$3,509
Gain After Federal Tax	$1,629	$5,263
Total Payout After Federal TAx	$2,629	$6,263
Compounded Annual Rate After Federal Tax	6.7%	13.0%

*15 Years is the earliest age at which the stand could be sold. Unless the owner needed the money at that time, foresters would generally recommend that he retain the stand and thin it at age 15-18 to take advantage of its still increasing growth rate and value increase.

The $1,000 invested in tree planting turns nonproductive land into a highly productive asset with an after tax compound rate of return of almost twice that obtainable from an 8% bond — 13.0% versus 6.7%.

Assuming an ad valorem tax rate of $2.50 annually and an 8 percent cost of capital, the tax on 11 acres accumulates to $747 in 15 years. Should the owner elect not to site prepare and plant the land and put his money in a bond, then it could be assumed that his $2,629 income from the bond could be reduced by the $747 ad valorem tax cost to a 15 year net of $1,882. On the other hand, the $6,263 payout of the 12 acre pine plantation could pay the $747 ad valorem tax cost and still show a net return of $5,516.

Of real significance is the fact that a fully stocked thrifty pine plantation can, with little additional cost, continue to add to the owners wealth at a rate of return that exceeds its first 15 year rate. As the trees are thinned and grow into sawtimber size their value will continue to increase at a rapid rate.

Improving a Stand of Pine Seedlings Can Be A Good Investment

A moderately stocked stand of naturally seeded pine seedlings offers an opportunity for an excellent return if an investment is made in timber stand improvement work. For a comparatively small cost per acre natural stands of pine seedlings can be released from undesirable suppressing trees and put into good condition for growth into merchantable stands of timber.

The following (at right) illustrates this point.

YIELD ON EIGHT PERCENT BOND VERSUS IMPROVING A STAND OF PINE TREES COMPARISON OF RETURN ON $1,000 INVESTMENT FOR A 11 YEAR PERIOD

This analysis assumes the following:

—The land is already owned by the prospective investor.

—The land supports a well-spaced stand of 5 year old slash pines with 400 trees per acre on land of average site quality.

—A planted stand of 400 old-field *slash* pine trees per acre on land of average site quality will produce approximately 16 cords per acre at age 16.[5] (Yield of natural stand is estimated to be 85% of planted stand or 14 cords per acre.)

—At an average cost of $35.00 per acre for removing competing undesirable trees, $1,000 would treat 28 acres.

—A present stumpage value of $12.00 per cord for pulpwood. Timber values increase with inflation. The current rate of inflation is about 9%. During the last 10 years pulpwood prices have increased at a compound rate of 6.5%.[7] This comparison uses 5% annual rate of inflation in the price of pulpwood. In 11 years $12.00 per cord inflates to $20.50 per cord.

14 cords per acre at harvest* of the trees × 28 acres = 392 cords × $20.50 per cord = $8,036 total gross payout.

	8% Bond	28 Acres Pine Trees
Invested Sum	$1,000	$1,000
Gross Payout After 11 Years (Timber is age 16)	$2,332	$8,036
Less Depletion (Recovery of Capital)	$1,000	$1,000
Total Gain	$1,332	$7,036
Capital Gain Exclusion 60%	-	$4,222
Taxable Gain	$1,332	$2,814
Less Income Tax - 25% rate	$ 333	$ 704
Balance	$ 999	$2,110
Plus Capital Gain Exclusion	-	$4,222
Gain After Federal Tax	$ 999	$6,332
Total Payment After Federal Tax	$1,999	$7,332
Compounded Annual Rate After Federal Tax	6.5%	19.8%

*15-16 years is the earliest age at which the stand could be sold. Unless the owner needed the money, at that time foresters would generally recommend that he retain the stand and thin it at age 16-18 to take advantage of its still increasing growth rate and value increase.

The foregoing example assumes that the pine seedlings are so overtopped and suppressed that it is unlikely that they will grow into merchantable timber unless an investment is made in timber stand improvement work. However, poor quality hardwoods in a good stand of pine seedlings does not always warrant investing in timber stand improvement work. Examination by a forester might determine that an area had sufficient seedlings free to grow into merchantability and without an investment to eliminate the hardwoods.

While genetically improved seedlings yield at a higher rate than naturally stocked seedlings, there are occasions when it is in the economic interest of the owner to manage a natural stand of seedlings that is already in place. The foregoing example illustrates this point.

An investment of $1,000 enables the owner to treat the 28 acres of naturally stocked seedlings and put them in good condition for future growth and income. The $35.00 per acre cost is much less than the amount that the owner might have spent on site preparation and planting if the natural stand had not been in place.

Comparison of Return of a Proposed Clearcut Timber Sale Versus Selling Only Selectively Marked Trees.

Unfortunately a high percentage of owners sell their timber under conditions in which the purchaser buys all the merchantable trees and clearcuts the timber sale area. In most instances this leaves the land in a denuded condition with little prospects of its returning to as high a level of productivity as when the timber was cut. Not only do many owners unnecessarily damage the future growth and income from the timberland by clearcutting their stands, but many sell their timber at a young age when it is just entering the period when it will put on the fastest growth and yield the highest income. This is not to say that there are no conditions under which owners would be wise to make clearcut timber sales. A forester can advise the owner on conditions when stands of timber are not likely to produce the best income. This might include areas with sparse, low yielding stands; stands of trees that have reached physical and financial maturity and should be cut followed by planting; and stands of timber that are badly damaged by fire, insects, and disease and should be salvaged. In these instances the owner would be wise to use part of the timber sale money to plant the cutover area with a new stand of improved trees.

FINANCIAL CONSIDERATIONS IN A CLEARCUT VERSUS A SELECTIVELY MARKED TIMBER SALE

The example on the following page is intended to show the comparative value of using a selectively marked timber sale in order to improve the quality and growth of the remaining timber, spread the timber income out over a longer period and realize a much higher timber income on a continuing basis. In this example, the saw-timber averages about 4,000 board feet per acre.

For the sake of comparison, the income from both types of sale is invested in a financial instrument such as a bond returning 8% compounded. The period of the investment is selected to be 8 years when the timber not sold would have grown into a larger size and better quality and the stand could be re-entered for another timber sale.

Timber values increase with inflation. During the last 10 years sawtimber prices have increased at a rate of about 12% annually.[8] The national rate of inflation is about 9% annually. This comparison uses 8% annual rate of inflation in the price of sawtimber. In 8 years the present average price of $100 per thousand board feet inflates to $185.09 per thousand board feet. The timber's expected future value is further increased by $15 to a total value of $200 per thousand since in 8 years the timber left to grow will be larger, of a much better quality and offering a good cut per acre.

The timber's growth rate after thinning should average about 8% annually.[9] Applying this 8% growth rate to the unmarked 2,000 board feet per acre left for future growth indicates that the unmarked timber will increase to approximately 3,280 board feet per acre in 8 years.

COMPARISON OF RETURN
CLEARCUT VERSUS SELECTIVELY MARKED TIMBER SALE

	Income if Timber is Clearcut	Valuation if Timber Sold By Selective Marking			
		Timber Sold		Timber Left	
Est. Pres. Volume/ Acre bd. ft.	4,000	2,000		2,000	
Est. Pres. Value/M bd. ft.	$100	$100		$100	
Est. Pres. Tot. Val/ Acre - Total Gain	$400*	$200*	+	$200**	= $400
Less 10% mark, meas., adv., sell & insp.	$ 40	$ 20			
Balance	$360	$180			
Capital Gain Exclusion 60%	$216	$108			
Taxable Gain	$144	$ 72			
Less Income Tax 25% Rate	$ 36	$ 18			
Balance	$108	$ 54			
Plus Capital Gain Exclusion	$216	$108			
Present Balance After Tax or value	$324	$162	+	$162**	= $324
Pres. Balance Invested 8 yrs. at 8%	$600	$300			
1987 Timber Value M bd/ft.				$200	
1987 Timber Volume bd/ft/acre				3,280	
Timber Value After 8 years				$656	
Less 10% mark, meas., adv., sell & insp.				$ 66	
Balance				$590	
Capital Gain Exclusion 60%				$354	
Taxable Gain				$236	
Less Income Tax 25% Rate				$ 59	
Balance				$177	
Plus Capital Gain EXclusion				$354	
Balance				$531	
Less 25% Tax on Interest Income	$ 69	$ 34			
Total Value After 8 Years	$531	$266	+	$531 =	$797
Compound Rate of Return[1]	6.4%	6.4%		(12.0%) 16.0%	

*Indicates estimated income from sale of timber.

**Value of timber left to grow for future income.

[1]Present balance after tax versus 8 years total value after tax assuming the owner and his advising forester decided to sell all the timber at that time.

This example (at left) illustrates two important points.

Selective marking and thinning of a stand of timber improves the rate of volume increase, places future growth on trees of better form and quality, and increases the average size of the trees to be sold in the future. Timber above average size and quality commands a premium market price.

Selective thinning removes the less desirable trees, opens up a timber stand and permits rapid volume growth on the better trees left for the future and, of real significance, allows the owner to look forward to another timber sale income in about eight years. This almost cuts in half the period he would have to wait for additional timber income if the immature timber had been clearcut and the area planted.

The 12.0% rate of return from the selective marking is almost double the 6.4% rate of return from the clear-cut practice.

Considerations in Leaving Seed Trees To Restock a Timber Sale Area

The seed tree method may, in certain instances, fit the needs of owners. High quality vigorously growing seed trees left on a timber sale area will usually cast sufficient seed to restock the land in a year or two.

Establishing a natural stand of trees can, in some instances, be less expensive than site preparation and planting. However, the owner and his advising forester should consider the returns obtainable from a naturally seeded stand versus that of a fully stocked and faster growing genetically improved planted stand.

FINANCIAL CONSIDERATIONS IN LEAVING SEED TREES TO RESTOCK A TIMBER SALE AREA

Many landowners are not aware of the real financial advantages to be gained by leaving sufficient seed trees to restock the harvested area in an economical and effective manner.

The purpose of the following is to compare the advantage of leaving 12 loblolly pine seed trees per acre versus clearcutting them and investing the money in an 8% bond or some other interest paying investments.

The analysis assumes the following:

—The proposed sale area supports a stand of pine sawtimber averaging 2800 board feet per acre.
—A 8% rate of inflation in the pine sawtimber stumpage value.
—That the selected loblolly pine seed trees will contain an average of about 75 board feet per tree and have a present market value of approximately $100 per thousand board feet.
—12 seed trees per acre × 75 board feet per tree = 900 board feet per acre × $100 per thousand board feet = $90.00 per acre current value.
—That the seed trees will, in 1-2 years, produce sufficient seed to restock the land with approximately 2 thousand or more seedlings per acre.
—That the following cultural practices will be accomplished.

1. The area to be prescribed burned prior to seedfall at an average cost of about $6.00 per acre to prepare a seed bed.
2. At seedling age of 4 to 5 years, a timber stand improvement treatment costing about $30.00 per acre will remove competing undesirable hard woods.
3. At about age 6 years the thick stand of young trees will receive a precommercial thinning at an average cost of $25.00 per acre to reduce the stocking to about 700 trees per acre.

The seed trees' growth rate should average about 8% annually.[9] At this growth rate their volume of 900 board feet per acre would increase to approximately 1476 board feet in 8 years.

At 8% rate of inflation in sawtimber stumpage, the current value of $100 per thousand board increases to $185 plus an additional $10 per thousand board feet to $195 per thousand since the timber will be much larger and of a better quality.

YIELD ON 8% BOND VERSUS LEAVING SEED TREES TO RESTOCK TIMBER SALE AREA

	Income if Seed Trees Are Sold	Valuation if Seed Trees Are Left
Est. Pres. Volume per Acre Bd. Ft.	900 b.f.	900 b.f.
Est. Pres. Value per M bd. ft.	$100	$100
Est. Pres. Total Value — Gain	$ 90	$ 90
Less 10% Cost (Mark, measure, adv., sell, insp.)	$ 81	
Capital Gain Exclusion 60%	$ 49	
Taxable Gain	$ 32	
Less Income Tax 25% Rate	$ 8	
Balance	$ 24	
Plus Capital Gain Exclusion	$ 49	
Estimated Present Balance - Value	$ 73	$ 73
Balance Invested 8 Yrs. at 8%	$135	
1987 Timber Priced M bd. ft.		$195
1987 Timber Volume/Acre With 8% Growth		1,476 b.f.
1987 Est. Sales Value		$288
Less 10% Cost (Mark, measure, adv., sell, insp.)		$ 29
Less Pres. Burn, TSI & Precomm. Thin. Exp.		$ 61
1987 Total Gain - Balance	$135	$198
Capital Gain Exclusion 60%		$119
Taxable Gain		$ 79
Less Income Tax 25% Rate	$ 16*	$ 20
Balance		$ 59
Plus Capital Gain Exclusion		$119
Balance After Federal Tax	$119	$178
1987 Value Young Stand of Trees/Acre		$ 82 **
Total Value After 8 Years	$119	$260
Compound Rate of Return[1]	6.3%	17%

*Tax on $62 of interest income.
**Estimated value of young timber stand after 6 years growth with 5% inflation in the $61.00 cost of establishment.
[1]Estimated present Balance-Value versus 1987 Total Value.

The foregoing example shows that leaving seed trees can be economically used to provide for the future stand. It does risk delay in stocking due to poor seed crop, drought, etc.

In addition to the more favorable rate of return (17 percent) obtained by leaving the seed trees rather than selling them, the owner receives an added benefit. Leaving the seed trees allows the owner to look forward to another timber sale income in about eight years when the seed trees should be sold and removed. Another timber sale income in eight years may be an important consideration for some owners.

INCOME PROSPECTS FROM DELAY OF THINNING VERSUS PROMPT THINNING OF PULPWOOD STANDS

Some owners delay thinning pulpwood size stands year after year because they consider pulpwood stumpage prices to be too low. This causes the stand to become stagnated and weakened, inviting insect attack. Stagnation increases mortality thereby losing timber volume. Natural thinning occurs but not in a manner that best improves the stand. The following is intended to show the comparative value of thinning pulpwood in order to grow the trees into the more profitable sawtimber size as soon as possible. For example, a one acre sampling of pulpwood timber on a tract might show the average size of the timber to be about the following:

Number of Trees By Diameter at Breast Height

DBH	4"	6"	8"	10"	12"	Total
Number		283	204	19		506
Cords		14	18	3		35

Total cords per acre 35 Current Growth Rate 2½%

Timber values increase with inflation. During the last 10 years pulpwood values have increased at a compound rate of about 6.5%[7] and sawtimber prices have increased at a rate of about 12% annually.[8] The national rate of inflation is about 9% annually. This comparison uses 5% for the annual rate of inflation in the price of pulpwood and 7% for the rate of inflation in the price of Chip-N-Saw timber.

The current local average price for pulpwood is about $7.00 a cord.

The local average price paid for Chip-N-Saw timber is about $25.00 per cord. At 5% compound rate of increase, the present value of pulpwood would increase to $10.00 per cord in 8 years. At 7% rate of inflation, the present value of Chip-N-Saw timber would increase to $43.00 per cord in 8 years when the stand could be reentered for another cut.

The timber's unthinned rate of growth is about 2½%.[9]

The timber's growth rate after thinning should be about 6%.[9]

	Valuation if Timber is Not Thinned		Valuation of Timber After a Thinning Sale			
			Timb. Sold		Timb. Left	
Est. Current-cords/acre	35		14		21	
Pres. stumpage value-cord	$ 7		$ 7		$ 7	
Pres. total value per acre	$245		$ 98		$147	
Less 15% (Mark, meas., adv., sell & insp.)			$ 83			
Less Federal Income Tax-Capital Gain			$ 75*			
Net Present Value Per Acre	$245		$ 75**	+	$147	= $222
Future Growth Rate	2½%				6%	

	Pulpwood		Chip-N-Saw	Pulpwood		Chip-N-Saw	
Pres. timber price/cord	$ 7		$ 25	$ 7		$ 25	
1987 timber price/cord	$ 10		$ 43	$ 10		$ 43	
1987 timber vol. cords/acre	31		11	11		20	
Less 15% for Mortality	26		9	11		20	
Est. 1987 Timber Value/acre	$260	+	$387	$110	+	$860	= $ 970
Est. 1987 total Value/acre		$647		$123 **	+	$970	= $1,093
Compound rate of return[1]		13%			25%		

*Income tax on 40% of the timber sold. Using a tax rate of 25% the income of $83 is reduced to $75.

**If $75 is invested in a bond earning 8%, its value at the end of 8 years would be $139 less 25% Federal Tax on interest income = $123.

[1]Net present value per acre versus Estimated 1987 total value per acre including value of 8% investment.

The foregoing example illustrates the real increase in value to be gained from growing young stands of timber into sawtimber size as soon as possible.

It should be kept in mind that the high rate of return (25 percent) in this example is obtained in areas where pulpwood prices are low as compared to higher market values elsewhere. It is apparent that owners in a $12 per cord pulpwood market would not experience the same rate of value increase when their pulpwood timber grows into sawtimber. However, all owners will receive a rapid increase in stumpage value by growing pulpwood size trees into sawtimber.

The comparative rate of return for the unthinned stand (13 percent) is highly speculative. It is impossible for foresters to predict what nature will do to relieve congestion in stagnated stands. Insects, disease and competition for growing space kills weakened trees. In such instances the surviving stand will contain a high percentage of trees that are diseased and of poor quality thus decreasing the average stumpage value.

Hardwoods

While the forest industry in Georgia utilizes more pine than hardwood timber, this is not to say that owners with hardwood land should ignore using a forester's advice and assistance in making an analysis of the income producing potential of their hardwood land. Good hardwood timberland, when properly managed, will produce an excellent return. The format used in the preceding examples for pine timberland can also be used to compare the advantage of investing in the improvement of hardwood forest land.

SUGGESTIONS FOR THE LANDOWNER

The Economic Potential of Forest Land Should Be Analyzed By A Forester

The blank forms in the Appendix are for the use of the owner and his advising forester in analyzing the income potential of his forest land. Each year's delay in examining the economic potential and implementing improvement of the land postpones realization of better timberland income and an increase in the owner's wealth.

Owning unproductive forest land wastes potential wealth and is unnecessary. Forest land like agricultural land yields the maximum only when growing fully stocked stands.

A comparatively small investment in improved forest practices can turn wasting unproductive forest land into a high yielding investment, the value of which will increase with time and the continued application of sound forest management practices.

Use A Forester's Advice and Assistance When Selling Timber

As previously stated, many owners believe that since nature established their current stand of timber without much assistance on the part of man that nature will establish another good stand without assistance. This is highly unlikely. Nature tends to allow hardwoods to restock land where the pine timber has been harvested.

Farm land is not being abandoned and naturally seeded to pine as it has been in the past. Prior to the statewide fire protection program, wildfires killed upland hardwoods and prepared a seedbed for establishment of pine timber. The old sawmill practice of cutting only the larger trees thereby leaving a young stand no longer holds because smaller trees are now cut for pulpwood. If the owner wants to maximize the income from his timberland he must work with and assist nature in establishing the next stand.

The owner's greatest opportunity for making or losing money is when he sells timber. This is the one time that he should call on his forester for assistance. His forester can examine the timber and advise the owner on the method of sale that will produce the maximum income and the type of cutting that will leave the land in the most favorable condition for future growth and income. In too many instances owners sell their timber when it is in a period of young and vigorous growth. Foresters recognize the time timber is in need of thinning, is economically mature and ready for harvest, and those stands with such light stocking that it should be sold and planted with improved trees that will yield the land's potential.

When a timber sale is in order, the forester can also provide valuable assistance by marking and measuring the timber to be sold, getting bids from prospective purchasers, and helping with the timber sale contract as well as the timber cutting operations. In addition the forester can provide advice and assistance with cultural practices that may be needed after the timber is removed.

SUMMARY

The purpose of this study is to illustrate procedures for comparing economic returns from an investment in a bond with investments in various forestry practices. *In using these procedures, the reader should use costs, timber values and yield tables that apply to his conditions.*

Most owners are wasting opportunities to gain the highly profitable income offered by their timberland through their failure to use the services of a forester and follow his advice when selling timber and installing practices to improve the timberland's growth and income.

APPENDIX

Literature Cited

1. **Holemo, Fred J., and E. Evan Brown.** 1975. A Profile of the Private Non-industrial Forest Landowner in Georgia's Coastal Plain. Georgia Forest Research Paper 82, 16 pp.
2. **Montgomery, Albert A., Vernon L. Robinson, James D. Strange.** 1976. Impacts of Land-Use Competition and Other Constraints on Georgia's Future Timber Supply. Georgia Forest Research Council Report No. 36, 24 pp.
3. **Lenhart, J. David and Jerome L. Clutter.** 1971. Cubic-Foot Yield Tables For Old-Field Loblolly Pine Plantations in the Georgia Piedmont. Georgia Forest Research Council Report No. 22. 12 pp.
4. U.S. Forest Service, "Service Foresters Handbook" 1975. Page 25.
5. **Bennett, Frank A.** 1970. Yields and Stand Structural Patterns for Old-Field Plantations of Slash Pine. U.S.D.A. — Forest Service Research Paper SE-60.
6. **Boyce, Stephen G.** 1975. "How To Double The Harvest of Loblolly and Slash Pine Timber" Journal of Forestry (12), pp. 761-776.
7. Forest Farmers Association, Forest Farmer, March 1977, Page 41.
8. Forest Farmers Association, Forest Farmer, March 1977, Page 40.
9. U.S. Forest Service, "Service Foresters Handbook" 1975. Pages 29-30.

COMPARISON OF INVESTING ALL OF A TIMBER SALE INCOME IN AN 8% BOND VERSUS USING PART OF THE MONEY TO REPLANT THE CUTOVER AREA AND INVESTING THE REMAINDER OF THE TIMBER SALE INCOME IN AN 8% BOND

Per Acre Averages on the _____ Acre Timber Sale Area

	Pulpwood		Sawtimber		
Ave. Vol. Per Acre Sold	_____ cords		_____ board feet		
Stumpage Price	$_____ per cd.		$_____ per M board feet		
Ave. Val. Recd. Per Acre	$_____	+	$_____	= $_____ Tot. x _____ Acres	= $_____
				Less Capital Gain Tax at _____%	$_____
				Net	$_____

This analysis assumes and compares the following:

-- At an average cost of $_____ per acre for site preparation and planting, $_____ would be required to plant the _____acres cutover in the timber sale.

-- A planted stand of _____ _____ pines per acre on land of average site quality will produce _____ cords per acre at _____ years of age.

-- A present stumpage value of $_____ per cord. Timber values increase with inflation. The current national rate of inflation is about _____%. During the last _____ years pulpwood prices have increased at a compound rate of about _____%. This comparison uses _____% annual rate of inflation for pulpwood stumpage. In _____ years $_____ per cord inflates to $_____ per cord. This analysis does not include an additional 15% to 20% increase in volume expected to be obtained by planting genetically improved trees.

_____ cords per acre at time of harvest* of the plantation x _____ acres = _____ cords x $_____ per cord = $_____ total gross pulpwood payout.

		$_____ in Planted Pines & _____% Bonds		
	All In 8% Bond	_____Acre Pine Plantation		Rest in _____% Bond
Invested Sum	$_____	$_____	($_____)	$_____
Gross Payout After 15 Years	$	$		$
Less Depletion (Recovery of Capital)	$_____	$_____		$_____
Total Gain	$	$		$
Capital Gain Exclusion _____%	-	$_____		$ -
Taxable Gain	$	$		$
Less Income Tax - _____% Rate	$_____	$_____		$_____
Balance	$	$		$
Plus Capital Gain Exclusion	-	$_____		$ -
Gain After Federal Tax	$	$		$
Total Payment After Federal Tax	$_____	$_____	($_____)	$_____
Compounded Rate After Federal Tax	_____%	_____	(_____%)	_____%

* _____years is the earliest age at which the stand could be sold. Unless the owner needed the money, at that time foresters would generally recommend that he retain the stand and thin it at age _____ to take advantage of its still increasing growth rate and value increase.

The _____Tract _____19___ _____Forester

The _____ Tract

YIELD ON EIGHT PERCENT BOND VERSUS PLANTED PINES
COMPARISON OF RETURN ON $1,000 INVESTMENT FOR A _____ YEAR PERIOD

This analysis assumes the following:

-- The land is already owned by the prospective investor.

-- At an average cost of $_____ per acre for site preparation and planting, $1,000 would plant _____ acres.

-- A planted stand of _____ _____ pines per acre on land of average site quality will produce _____ cords per acre at _____ years of age.

-- A present stumpage value of $_____ per cord. Timber values increase with inflation. The current national rate of inflation is about _____%. During the last _____ years pulpwood prices have increased at a compound rate of about _____%. This comparison uses _____% annual rate of inflation for pulpwood stumpage. In _____ years $_____ per cord inflates to $_____ per cord. This analysis does not include an additional 15% to 20% increase in volume expected to be obtained by planting improved trees.

_____ cords per acre at time of harvest* of the plantation x _____ acres = _____ cords x $_____ per cord = $_____ total gross payout.

	8% Bond	_____ Acre Pine Plantation
Invested Sum	$ 1,000	$ 1,000
Gross Payout After _____ Years	$	$
Less Depletion (Recovery of Capital)	$ 1,000	$ 1,000
Total Gain	$	$
Capital Gain Exclusion _____%	-	$
Taxable Gain	$	$
Less Income Tax - _____% Rate	$	$
Balance	$	$
Plus Capital Gain	-	$
Gain After Federal Tax	$	$
Total Payout After Federal Tax	$	$
Compounded Annual Rate After Federal Tax	_____%	_____%

*_____ Years is the earliest age at which the stand could be sold. Unless the owner needed the money, at that time foresters would generally recommend that he retain the stand and thin it at age _____ to take advantage of its still increasing growth rate and value increase.

Date: _____197__ Prepared by: _____
Forester

The _____ Tract

YIELD ON EIGHT PERCENT BOND VERSUS IMPROVING A STAND OF PINE TREES
COMPARISON OF RETURN ON $1,000 INVESTMENT FOR A _____ YEAR PERIOD

This analysis assumes the following:

-- The land is already owned by the prospective investor.

-- The land supports a well-spaced stand of _____ year old _____ pines with _____ trees per acre on land of average site quality.

-- A planted stand of _____ old-field _____ pine trees per acre on land of average site quality will produce approximately _____ cords per acre at age _____. Yield of natural stand is estimated to be _____% of the planted stand or _____ cords per acre.

-- At an average cost of $_____ per acre for removing competing undesirable trees, $1,000 would treat _____ acres.

-- A present stumpage value of $_____ per cord for pulpwood. Timber values increase with inflation. The current rate of inflation is about _____%. During the last _____ years pulpwood prices have increased at a compound rate of _____%. This comparison uses _____% annual rate of inflation in the price of pulpwood. In _____ years $_____ per cord inflates to $_____ per cord.

_____ cords per acre at harvest* of the trees x _____ acres = _____ cords x $_____ per cord = $_____ total gross payout.

	8% Bond	_____Acres Pine Trees
Invested Sum	$ 1,000	$ 1,000
Gross Payout After _____Years (Timber is age ____)	$	$
Less Depletion (Recovery of Capital)	$ 1,000	$ 1,000
Total Gain	$	$
Capital Gain Exclusion _____%	-	$
Taxable Gain	$	$
Less Income Tax - _____% rate	$	$
Balance	$	$
Plus Capital Gain Exclusion	-	$
Gain After Federal Tax	$	$
Total Payment After Federal Tax	$	$
Compounded Annual Rate After Federal Tax	_____%	_____%

*_____ years is the earliest age at which the stand could be sold. Unless the owner needed the money, at that time foresters would generally recommend that he retain the stand and thin it at age _____ to take advantage of its still increasing growth rate and value increase.

Date: _____197__ Prepared by: _____
Forester

FINANCIAL CONSIDERATIONS IN A
CLEARCUT VERSUS A SELECTIVELY MARKED TIMBER SALE

Comparison for the _____ Tract

The following is intended to show the comparative value of using a selectively marked timber sale in order to improve the quality and growth of the remaining timber, spread the timber income out over a longer period and realize a much higher timber income on a continuing basis. In this example, the sawtimber averages about _____ board feet per acre.

For the sake of comparison, the income from both types of sale is invested in a financial instrument such as a bond returning _____% compounded. The period of the investment is selected to be _____ years when the timber not sold would have grown into a larger size and better quality and the stand could be re-entered for another timber sale.

Timber values increase with inflation. During the last _____ years sawtimber prices have increased at a rate of about _____% annually. The national rate of inflation is about _____% annually. This comparison uses _____% annual average rate of inflation in the price of sawtimber. In _____ years the present average price of $_____ per thousand board feet inflates to $_____ per thousand board feet. The timber's expected future value is further increased by $_____ to a total value of $_____ per thousand since in _____ years the timber left to grow will be larger, of a much better quality and offering a good cut per acre.

The timber's growth rate after thinning should average about _____% annually. Applying _____% growth rate to the unmarked _____ board feet per acre left for future growth indicates that the unmarked timber will increase to approximately _____ board feet per acre in _____ years.

COMPARISON OF RETURN
CLEARCUT VERSUS SELECTIVELY MARKED TIMBER SALE

_____ Tract

	Income if Timber is Clearcut	Valuation if Timber Sold By Selective Marking		
		Timber Sold	Timber Left	
Est. Pres. Volume/Acre bd. ft.	_____	_____	_____	
Est. Pres. Value/M bd. ft.	$_____	$_____	$_____	
Est. Pres. Tot. Val/Acre-Tot. Gain	$_____*	$_____* +	$_____**	= $_____
Less _____% mark, meas., adv., sell & insp.	$_____	$_____		
Balance	$_____	$_____		
Capital Gain Exclusion _____%	$_____	$_____		
Taxable Gain	$_____	$_____		
Less Income Tax _____% Rate	$_____	$_____		
Balance	$_____	$_____		
Plus Capital Gain Exclusion	$_____	$_____		
Present Balance After Tax or Value	$_____	$_____ +	$_____**	= $_____
Pres. Balance Invested _____ years at _____%	$_____	$_____		
198_ Timber Value M bd/ft.			$_____	
198_ Timber Volume bd/ft/acre			_____	
Timber Value After _____ years			$_____	
Less _____% mark, meas., adv., sell & insp.			$_____	
Balance			$_____	
Capital Gain Exclusion _____%			$_____	
Taxable Gain			$_____	
Less Income Tax _____% Rate			$_____	
Balance			$_____	
Plus Capital Gain Exclusion			$_____	
Balance			$_____	
Less _____% Tax on Interest Income	$_____	$_____		
Total Value After _____ Years	$_____	$_____ +	$_____	= $_____
Compound Rate of Return 1/	_____%	_____%(___%)		_____%

*Indicates estimated income from sale of timber.
**Value of timber left to grow for future income.
1/Present balance after tax versus _____ year total value after tax assuming the owner and his advising forester decided to sell all the timber at that time.

Date: _____19____ _____
Forester

FINANCIAL CONSIDERATIONS IN LEAVING SEED TREES
TO RESTOCK A TIMBER SALE AREA

Many landowners are not aware of the real financial advantages to be gained by leaving sufficient seed trees to restock the harvested area in an economical and effective manner.

The purpose of the following is to compare the advantages of leaving _____ _____ pine seed trees per acre versus clearcutting them and investing the money in an 8% bond or some other interest-paying investment.

The analysis assumes the following:

-- The proposed sale area supports a stand of pine sawtimber averaging _____ board feet per acre.

-- A _____% rate of inflation in the pine sawtimber stumpage value.

-- That the selected _____ pine seed trees will contain an average of about _____ board feet per tree and have a present market value of approximately $_____ per thousand board feet.

-- _____ seed trees per acre x _____ board feet per tree = _____ board feet per acre x $_____ per thousand board feet = $_____ per acre current value.

-- That the seed trees will, in 1-2 years, produce sufficient seed to restock the land with approximately _____ thousand or more seedlings per acre.

-- That the following cultural practices will be accomplished.

1. The area to be prescribed burned prior to seedfall at an average cost of about $_____ per acre to prepare a seed bed.

2. At seedling age of _____ to _____ years, a timber stand improvement treatment costing about $_____ per acre will remove competing undesirable hardwoods.

3. At about age _____ years the thick stand of young trees will receive a precommercial thinning at an average cost of $_____ per acre to reduce the stocking to about _____ trees per acre.

The seed trees' growth rate should average about _____% annually. At this growth rate their volume of _____ board feet per acre would increase to approximately _____ board feet in _____ years.

At _____% rate of inflation in sawtimber stumpage, the current value of $_____ per thousand board increases to $_____ plus an additional $_____ per thousand board feet to $_____ per thousand since the timber will be much larger and of a better quality.

The _____ Tract Date _____19____ _____
Forester

YIELD ON 8% BOND VERSUS LEAVING SEED TREES TO RESTOCK TIMBER SALE AREA

	Income if Seed Trees Are Sold	Valuation if Seed Trees Are Left
Est. Pres. Volume per Acre Bd. Ft.	_____b.f.	_____b.f.
Est. Pres. Value per M bd. ft.	$_____	$_____
Est. Pres. Total Value - Gain	$_____	$_____
Less _____% Cost (Mark, measure, adv., sell, insp.)	$_____	
Capital Gain Exclusion _____%	$_____	
Taxable Gain	$_____	
Less Income Tax _____% Rate	$_____	
Balance	$_____	
Plus Capital Gain Exclusion	$_____	
Estimated Present Balance - Value	$_____	$_____
Balance Invested _____ Yrs. at _____%	$_____	
198_ Timber Price M bd. ft.		$_____
198_ Timber Volume/Acre With _____% Growth		_____b.f.
198_ Est. Sales Value		$_____
Less _____% Cost (Mark, measure, adv., sell, insp.)		$_____
Less Pres. Burn, TSI & Precomm. Thin. Exp.		$_____
198_ Total Gain - Balance	$_____	$_____
Capital Gain Exclusion _____%		$_____
Taxable Gain		$_____
Less Income Tax _____% Rate	$_____*	$_____
Balance		$_____
Plus Capital Gain Exclusion		$_____
Balance After Federal Tax	$_____	$_____
198_ Value Young Stand of Trees/Acre		$_____**
Total Value After _____Years	$_____	$_____
Compound Rate of Return[1/]	_____%	_____%

* Tax on $_____ of interest income

** Estimated value of young timber stand after _____ years growth with _____% inflation in the cost of establishment.

1/ Estimated present Balance-Value-Total Gain versus 198_ Total Value.

The _____Tract Date _____19____ _____

Forester

INCOME PROSPECTS FROM DELAY OF THINNING VERSUS
PROMPT THINNING OF PULPWOOD STANDS

Comparison for the _____ Tract

Some owners delay thinning pulpwood size stands year after year because they consider pulpwood stumpage prices to be too low. This causes the stand to become stagnated and weakened, inviting insect attack. Stagnation increases mortality thereby losing timber volume. Natural thinning occurs but not in a manner that best improves the stand. The following is intended to show the comparative value of thinning pulpwood in order to grow the trees into the more profitable sawtimber size as soon as possible. For example, a one acre sampling of pulpwood timber on this tract might show the average size of the timber to be about the following:

Number of Trees By Diameter At Breast Height

DBH	4"	6"	8"	10"	12"	Total
Number	_____	_____	_____	_____	_____	_____
Cords	_____	_____	_____	_____	_____	_____

Total Cords Per Acre _____ Current Growth Rate _____%

Timber values increase with inflation. During the last _____ years pulpwood values have increased at a compound rate of about _____% and sawtimber prices have increased at a rate of about _____% annually. This comparison uses _____% for the annual rate of inflation in the price of pulpwood and _____% for the rate of inflation in the price of Chip-N-Saw timber.

The current local average price for pulpwood is about $_____ a cord.

The local average price paid for Chip-N-Saw timber is about $_____ per cord. At _____% compound rate of increase, the present value of pulpwood would increase to $_____ per cord in _____ years. At _____% rate of inflation, the present value of Chip-N-Saw timber would increase to $_____ per cord in _____ years when the stand could be reentered for another cut.

The timber's unthinned rate of growth is about _____%.

The timber's growth rate after thinning should be about _____%.

INCOME PROSPECTS OF DEFERRED THINNING
VERSUS
THINNING TIMBER TO IMPROVE GROWTH AND QUALITY

_____ Tract

	Valuation if Timber is not Thinned	Valuation of Timber After a Thinning Sale	
		Timb. Sold	Timb. Left
Est. Current Volume - cords/acre	_____	_____	_____
Pres. stumpage value - cord	$_____	$_____	$_____
Pres. total value per acre	$_____	$_____	+ $_____
Less _____% (Mark, meas., adv., sell & insp.)		$_____	
Less Federal Income Tax - Capital Gain		$_____*	
Net Present Value Per Acre	$_____	$_____**	+ $_____ =$_____
Future Growth Rate	_____%		_____%

	Pulpwood	Chip-N-Saw	Pulpwood	Chip-N-Saw
Pres. timber price/cord	$_____	$_____	$_____	$_____
198_ timber price/cord	$_____	$_____	$_____	$_____
198_ timber vol. cords/acre	_____	_____	_____	_____
Less _____% for Mortality	_____	_____	_____	_____
Est. 198_ Timber Value/acre	$_____	+ $_____	$_____	+ $_____ = $_____
Est. 198_ Total Value/acre	$_____		$_____**	+ $_____ = $_____
Compound rate of return[1/]	_____%		_____%	

* Income tax on _____% of the timber sold. Using a tax rate of _____% the income of $_____ is reduced to $_____.

** If $_____ is invested in a bond earning _____%, its value at the end of _____ years would be $_____ less _____% Federal Tax on interest income = $_____.

1/ Net present value per acre versus Estimated 198_ total value per acre including value of _____% investment.

Date: _____ 19___ Prepared by: _____
Forester

GEORGIA FORESTRY COMMISSION

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