

Tree Cropping Options in Georgia with the Re-authorized Conservation Reserve Program

**A guide for land owners currently enrolled in the CRP with trees planted and
who are considering re-bidding that land into the re-authorized CRP.**

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Introduction

Georgia has 706,459 acres in the Conservation Reserve Program (CRP), with 645,931 (91%) of these acres planted to CRP trees. Contracts for approximately 260,000 acres in the CRP in Georgia will have expired by the end of 1996. Current CRP acres are considered planted to an agricultural commodity and are eligible for re-bid into the re-authorized CRP subject to an average erodibility index (EI) greater than or equal to 8T. Up to 53% of the land currently enrolled in CRP in Georgia will meet this criterion.

The CRP was created by the 1985 Food Security Act (Farm Bill) and continued in the 1990 Farm Bill and the Federal Agricultural Improvement and Reform Act (FAIR) of 1996. The CRP was initiated for a host of objectives including those to reduce soil erosion, retire marginal agricultural lands, improve water quality, and provide financial support for owners and operators of highly erodible farm land. Approximately 36.4 million acres nationwide have been enrolled in the program. Over one-half of the land enrolled in CRP is in contracts that will expire by the fall of 1997. Thus, many producers will be making difficult and important decisions about what to do with current CRP acreage in the future.

Purpose

This publication is intended to provide a guide for land owners currently enrolled in the CRP with trees planted and who are considering re-bidding that land into the re-authorized CRP.

New growth modeling

A study done by L.V. Pienaar and J.W. Rheney in 1996 examines the growth of oldfield pine plantations enrolled in the CRP. They found growth rates substantially above those used to model these sites in the past. The study by Pienaar and Rheney reports the maximum wood-flow attainable under stand conditions where all competing vegetation is eliminated. Also reported are expected wood-flows under growing conditions more likely to be found in oldfield pine plantations, i.e., some weed competition, stand mortality, etc.

These new, more expected growth rates have been approximated in the modeling for this bulletin and are intended to serve as a guide for landowner expectations of future oldfield growth rates and financial returns.

Options for CRP pines in Georgia

The options considered in this publications are:

1. Do not re-bid CRP land in trees at the end of current contract. Grow trees to financial maturity.
2. Re-bid CRP land with trees into the CRP for another 10-year contract without thinning trees. Grow trees to financial maturity with thinnings as needed after second CRP contract expiration for pulpwood and a longer multiple-product rotation.
3. Wait one year for tree thinning operation, after current CRP contract expiration. Then, re-bid

CRP land with trees into the CRP for another 10-year contract. Grow trees to financial maturity for pulpwood or a longer multiple-product rotation.

4. Clear-cut trees at age 11 years, after current CRP contract expiration. Then, re-bid CRP land, with a new crop of trees, into the CRP for another 10-year contract. Grow trees to financial maturity for pulpwood or a longer multiple-product rotation.

5. Lease CRP pines at the end of the current contract.

CRP Tree Uses

The new CRP program has provisions for contract extensions from 10 to 15 years for certain tree crops. Also, trees are allowed for alley-cropping wherein trees are planted in rows with an applicable agricultural crop planted in the row middles. CRP contracts existing before November 28, 1990 are allowed to convert to a tree crop use under the new rules. Generally, forest trees are listed as an acceptable permanent vegetative cover on new CRP acres. Trees can serve well in the new CRP for land areas under continuous enrollment for stream-side management and wind-breaks, among other uses.

Site index comes with the land you have, so, examine your particular land to determine how well it is suited for loblolly or slash pines. You also need to know its productivity for growing trees in general. To get help with these CRP forest tree decisions contact your forestry extension agent or your state forestry commission.

At this writing, certain restrictions exist concerning acceptability of forest tree types for CRP plantings. Land currently enrolled in the CRP and planted to trees will be eligible for the re-authorized CRP, subject to other eligibility requirements. However, rules covering tree thinning have not been finalized yet. Consult with your local Extension or Farm Service Agency (FSA) office for clarification of the final rules.

Benefits of CRP tree crops

The CRP provides eligible landowners the opportunity to convert the use of eroding cropland to productive forest tree crops. Generally, forest tree crops are economically viable where wood markets exist. Tree crops can also be expected to provide long-run benefits to multiple wildlife species, crop species diversity, and reduced wind and water soil erosion to provide clean air and water.

Forest tree crops established on CRP lands can provide income streams that extend for many years, even beyond the contract period. This long-term forest income should be included in the decision criteria when comparing CRP tree opportunities with other current agricultural crop options.

Value of CRP annual payments

Georgia leads the nation with acres planted to CRP trees since 1986. Nationally, the average cost share payments for establishment of trees is \$34.20 per acre. Average annual per acre rental payment for maintenance of trees in Georgia is \$43.06.

The annual CRP payment can be earned by qualifying landowners who adopt any of the approved practices. As such, this payment can be considered as a payment from society to convert land use from annual row cropping patterns to a long-term sustainable use. In our examples, this annual payment is considered separate from the returns to a tree crop, the long-term sustainable land use.

CRP Tree Growing Option Details

1. Do not re-bid CRP land in trees at the end of current contract

This is the simplest of the options discussed. Two common tree-growing scenarios that apply to CRP tree crops, 20-year pulpwood and 33-year, multiple product rotations, are examined here. Each scenario is examined for two pine species, slash (*Pinus elliottii* Engelm.) and loblolly (*Pinus taeda* L.) using YIELDplus v4.0 (Hepp 1994).

Grow trees to financial maturity

To simplify the examples, pulpwood rotations are shown without thinnings, Table 1. Multiple product rotations are thinned at years 18 and 25 with a clear-cut at year 33, Table 1. In addition, examples are shown for low, medium, and high land productivity and for two, broad market areas, coastal and Piedmont Georgia.

Wood-flow performance

From the wood-flow information presented in Table 1 you can see that the longer rotations produce more total volume of wood. Note also that loblolly out-produces slash pine on most sites. Also, land with a higher site index, i.e. higher productivity, produces more wood than land with a lower site index. Landowners can choose between growing trees on longer or shorter rotations depending upon their individual situations. Relatively short, pulpwood rotations are more common in south Georgia. Longer, multiple product rotations are more common in Piedmont Georgia.

Financial performance

We also make a comparison between the financial performance of the wood-flow examples shown in Table 1. Financial performance for coastal Georgia rotations are shown in Table 2. Financial performance for Piedmont Georgia rotations are shown in Table 3.

As with the wood-flow comparisons, the net present worth of the longer, multiple product rotations is greater than for the shorter, pulpwood rotations. However, the internal rate of return, one measure of efficiency of the investment, and annual equivalent value per acre for the shorter rotations are slightly higher. Tree growers can generally earn more total dollar returns with longer rotations on the same land. The trade-off with longer rotations is that you must wait longer to make more money from growing trees. Again, individual landowner preference, or selection of a financial planning period, is the key to deciding on longer or shorter tree rotations.

Notice in Tables 2 and 3 that loblolly out-performs slash, and more productive land out-performs land with a lower site index. You can choose between growing slash or loblolly pines, but the site index comes with the land you have. So, it is important to examine your particular land

carefully to determine if it is better suited for slash or loblolly. You also need to know its productivity for growing trees. A forester can help you with these decisions. Also, see Bulletin 983, Selecting and Planting Pine Seedlings, listed under suggested readings at the end of this bulletin, for details on identifying slash and loblolly sites.

Table 1. Coastal and Piedmont Georgia, planted oldfield pine harvested wood-flow projections for 20-year, un-thinned pulpwood rotations, or 33-year, multiple product rotations¹.

Species	Site Productivity	20-year Harvested Pulpwood ²	33-year Harvested Multiple-product ³		
		Cords	Cords		
		Yr.20	Yr.18	Yr.22	Yr.33
Slash	Low	33	10	5	29
	Medium	41	13	5	32
	High	47	15	5	36
Loblolly	Low	46	20	9	36
	Medium	51	23	10	39
	High	56	27	11	41

¹ 700 surviving trees per acre at age 0, in 1986 (6X10 or 5X12 spacing). Scribner rule.

² Cord equivalents: pulpwood top diameter = 2"; Max. Cuft/cord = 90; Min. pulpwood dbh = 4.0"; Min. sawtimber dbh = 8.0" to 6" top.

³ First thinning even, second thinning low at years 18 and 25, and clear-cut in year 33.

Table 2. Coastal Georgia planted oldfield pine financial performance projections for 20-year, un-thinned pulpwood rotations, or 33-year multiple-product rotations¹.

Species	Site Productivity	NPW ² \$/Acre	IRR ³ %	AEV ⁴ \$/Acre/year
20-year pulpwood				
Slash	Low	207	13.8	21
	Medium	289	15.2	29
	High	382	16.5	39
Loblolly	Low	332	15.8	34
	Medium	410	16.7	42
	High	499	17.7	51
33-year multiple-product				
Slash	Low	231	12.2	20
	Medium	314	13.2	27
	High	410	14.2	36
Loblolly	Low	533	15.4	46
	Medium	667	16.4	58
	High	796	17.2	69

¹ 8% discount rate; 1986 Prices: PW = \$25/cord, C-N-S = \$44/cord, ST = \$164/MBF, Big ST = \$168/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);

1997 Price-equivalents: PW = \$35/cord, C-N-S = \$62/cord, ST = \$243/MBF, Big ST = \$249/MBF.

² Net present worth is calculated with revenues discounted to present year less costs discounted to present year at an 8% discount rate. A net present worth value greater than zero indicates that at least the discount rate is being earned on the investment.

³ Internal rate of return is the interest rate at which discounted revenues equal discounted costs. It assumes that all intermediate revenues are reinvested into the project. A project is considered profitable if the internal rate of return exceeds the discount rate.

⁴ Annual equivalent value is the net present worth expressed as an annuity over the planning horizon, computed at the discount rate. Annual equivalent value is a useful measure for comparing investments over unequal time periods.

Table 3. Piedmont Georgia planted oldfield pine financial performance projections for 20-year, un-thinned pulpwood rotations, or 33-year multiple-product rotations¹.

Species	Site Productivity	NPW ² \$/Acre	IRR ³ %	AEV ⁴ \$/Acre/year
20-year pulpwood				
Loblolly	Low	195	11.6	20
	Medium	258	14.7	26
	High	333	15.8	34
33-year multiple-product				
Loblolly	Low	376	13.7	33
	Medium	477	14.6	41
	High	604	15.6	53

¹ 8% discount rate; 1986 Prices: PW = \$17/cord, C-N-S = \$36/cord, ST = \$145/MBF, Big ST = \$157/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);
1997 Price-equivalents: PW = \$24/cord, C-N-S = \$51/cord, ST = \$215/MBF, Big ST = \$232/MBF.

² Net present worth

³ Internal rate of return

⁴ Annual equivalent value

2. Re-bid CRP land with trees into the CRP for another 10-year contract without thinning trees.

Grow trees to financial maturity with thinnings as needed after second CRP contract expiration for pulpwood and a longer multiple-product rotation. The results for this scenario are the same as those shown for the un-thinned 20-year pulpwood example under option 1. above in Tables 1, 2, and 3.

3. Wait one year for tree thinning operation at age 11 years

Thin immediately after current CRP contract expiration. Then, re-bid CRP land with trees into the CRP for another 10-year contract. Grow trees to age 22 years for pulpwood, or for a longer 33-year multiple-product rotation. Analysis results are shown below in tables 4, 5, and 6.

Table 4. Coastal and Piedmont Georgia, planted oldfield pine wood-flow projections for CRP trees re-entered into the new CRP with 22-year, thinned pulpwood rotations, or 33-year, multiple product rotations¹.

Species	Site Productivity	22-year Harvested Pulpwood ²		33-year Harvested Multiple-product ²		
		Cords		Cords		
		Yr.11 ³	Yr.22	Yr.11 ³	Yr.22	Yr.33
Slash (coastal only)	Low	--	39	--	16	29
	Medium	--	45	--	20	32
	High	--	52	--	23	36
		Yr.11 ⁴	Yr.22	Yr.11 ⁵	Yr.22	Yr.33
Loblolly (coastal & Piedmont)	Low	9	39	7	18	40
	Medium	11	42	9	20	43
	High	14	46	11	22	46

¹ 700 surviving trees per acre at age 0, in 1986 (6X10 or 5X12 spacing). Scribner rule.

² Cord equivalents: pulpwood top diameter = 2"; Max. Cuft/cord = 90; Min. pulpwood dbh = 4.0"; Min. sawtimber dbh = 8.0" to 6" top.

³ Slash stands did not show positive returns to thinning at age 11 years.

⁴ Even thinning at year 11, and clear-cut in year 21.

⁵ First thinning even, second thinning low at years 11 and 22, and clear-cut in year 33.

Table 5. Coastal Georgia planted oldfield pine financial performance projections for CRP trees re-entered into the new CRP with 22-year, thinned pulpwood rotations, and 33-year multiple-product rotations¹.

Species	Site Productivity	NPW ² \$/Acre	IRR ³ %	AEV ⁴ \$/Acre/year
20-year pulpwood⁵				
Slash	Low	226	13.5	22
	Medium	312	14.7	31
	High	408	15.8	40
Loblolly	Low	445	17.9	44
	Medium	540	19.3	53
	High	662	20.8	65
33-year multiple-product⁶				
Slash	Low	213	11.9	19
	Medium	307	13.0	27
	High	410	14.0	36
Loblolly	Low	592	15.9	51
	Medium	745	17.1	65
	High	917	18.4	80

¹ 8% discount rate; 1986 Prices: PW = \$25/cord, C-N-S = \$44/cord, ST = \$164/MBF, Big ST = \$168/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);
1997 Price-equivalents: PW = \$35/cord, C-N-S = \$62/cord, ST = \$243/MBF, Big ST = \$249/MBF.

² Net present worth

³ Internal rate of return

⁴ Annual equivalent value

⁵ Even thinning at year 11, and clear-cut in year 22.

⁶ First thinning even, second thinning low at years 11 and 22, and clear-cut in year 33.

Table 6. Piedmont Georgia planted oldfield pine financial performance projections for CRP trees re-entered into the new CRP with 22-year, thinned pulpwood rotations, or 33-year multiple-product rotations¹.

Species	Site Productivity	NPW ² \$/Acre	IRR ³ %	AEV ⁴ \$/Acre/year
20-year pulpwood⁵				
Loblolly	Low	295	15.6	29
	Medium	372	16.9	37
	High	473	18.3	46
33-year multiple-product⁶				
Loblolly	Low	417	13.9	36
	Medium	539	15.0	47
	High	666	16.3	58

¹ 8% discount rate; 1986 Prices: PW = \$17/cord, C-N-S = \$36/cord, ST = \$145/MBF, Big ST = \$157/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);

1997 Price-equivalents: PW = \$24/cord, C-N-S = \$51/cord, ST = \$215/MBF, Big ST = \$232/MBF.

² Net present worth.

³ Internal rate of return

⁴ Annual equivalent value

⁵ Even thinning at year 11, and clear-cut in year 22.

⁶ First thinning even, second thinning low at years 11 and 22, and clear-cut in year 33.

4. Clear-cut trees at age 11 years

Clear-cut stand after current CRP contract expiration. Then, options include: re-bid as CRP land, with a new crop of trees, or other qualifying crop, into the CRP for another 10-year contract; stay out of CRP and clear land for agricultural production of annual crops. Results are shown in table 7 below.

Table 7. Coastal and Piedmont Georgia, planted oldfield pine wood-flow and financial performance projections for CRP trees clear-cut at age 11 years¹.

Species	Site Productivity	Harvested Pulpwood ² Year 11 Cords	NPW ³ \$/Acre	IRR ⁴ %	AEV ⁵ \$/Acre/year
Coastal Georgia⁶					
Slash	Low	21	157	17.9	22
	Medium	24	202	19.7	28
	High	28	249	21.3	35
Loblolly	Low	27	236	20.9	33
	Medium	30	286	22.6	40
	High	34	340	24.1	48
Piedmont Georgia⁷					
Loblolly	Low	27	120	16.2	17
	Medium	30	156	17.8	22
	High	34	192	19.4	27

¹ 700 surviving trees per acre at age 0, in 1986 (6X10 or 5X12 spacing). Scribner rule.

² Cord equivalents: pulpwood top diameter = 2"; Max. Cuft/cord = 90; Min. pulpwood dbh = 4.0"; Min. sawtimber dbh = 8.0" to 6" top.

³ Net present worth.

⁴ Internal rate of return.

⁵ Annual equivalent value.

⁶ 8% discount rate; 1986 Prices: PW = \$25/cord, C-N-S = \$44/cord, ST = \$164/MBF, Big ST = \$168/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);
1997 Price-equivalents: PW = \$35/cord, C-N-S = \$62/cord, ST = \$243/MBF, Big ST = \$249/MBF.

⁷ 8% discount rate; 1986 Prices: PW = \$17/cord, C-N-S = \$36/cord, ST = \$145/MBF, Big ST = \$157/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);
1997 Price-equivalents: PW = \$24/cord, C-N-S = \$51/cord, ST = \$215/MBF, Big ST = \$232/MBF.

Considerations for clearing trees and planting annual crops

- Value of trees at harvest?
(yr. 15, 20, pine straw, hunting, etc.)
- Cost of land clearing, terraces?
(\$200 to \$350 / Acre?)
- Soil productivity
(erosion, drought, slope, soil type)
- Farm management plan?
(govt. program participation, Swamp busting if wetland)
- Alternate crops: Corn, Soybeans, Cotton, Hay, Pasture?
- Annual net returns to crops?
- Crop requirements: capital, equipment, labor
- Why is land in CRP now?

Recovering land reclearing costs

If land is cleared, the crop following trees must be profitable enough to cover the cost in a reasonable time frame. Evaluating land productivity, costs of crop production, and projected crop prices are important when considering clearing land for annual crops. Also, consider why marginal cropland is enrolled in the CRP program. Your local County Extension Agent can help you figure net returns for crops under consideration on your land. Net annual crop returns needed to recover land reclearing costs, after tree harvest, are shown in Table 8.

Table 8. Net returns from annual crops needed to recover land clearing costs after a tree crop, shown in dollars per acre¹.

Clearing cost &/Acre	Years to recover cost	Annual \$/Acre ²
200	1	220
	5	53
	10	33
	15	27
	20	23
	25	22
	30	21
250	1	275
	5	66
	10	41
	15	33
	20	29
	25	28
	30	27
300	1	330
	5	79
	10	49
	15	39
	20	35
	25	33
	30	32
350	1	285
	5	92
	10	57
	15	46
	20	41
	25	39
	30	37

¹ A 10 percent interest rate for borrowed capital is assumed.

² Using the installment payment formula.

5. Lease trees from CRP contract expiration to financial maturity

At expiration of the CRP contract the landowner is faced with at least several other options. The landowner may sell (take a lump sum payment) or lease (take annual payments) the growing trees near the end of the CRP contract for the duration of the tree rotation. There should also be a consideration for regeneration of the stand after harvest.

Some timber lease assumptions.

Landowner may:

- Retain land ownership.
- Pay annual land ad valorem taxes.
- Retain hunting lease rights.
- Retain pine straw harvest rights.

Lessee may:

- Pay lump sum or annual lease payment to landowner.
- Assume fire protection responsibility.
- Prescribed fire program.
- Assume general tree management.
- Use best management practices (BMP's).
- Assume risk of tree loss from natural disasters.
- Pay ad valorem tax on trees at harvest.
- Pay all marketing and harvesting related costs.
- Maintain legal boundaries at lease end.
- Clear-cut stand at end of lease.
- Regenerate tree stand after clear-cut.

Timber Lease Considerations

Reasons for landowners to lease timber stands:

- Earn annual income from tree crops.
- Lease rate based on **YOUR** trees: stand conditions, tree species, market area, site index, etc.
- Benefit from high level of management knowledge of lessee.
- Transfer risks of loss of tree production and marketing to lessee.

Reasons for landowner not to lease timber:

- Have adequate timber management ability.

- Seeks to earn all returns from trees (management, risk, labor, capital, etc.).

Landowner options without timber lease:

- Provide own timber management/marketing expertise.
- Hire high quality timber management/marketing expertise through professional forestry consultant.
- Assumes all risks of profit or loss from growing trees.
- Freedom of unencumbered land ownership.

Lease example

This example shows establishing lease rates from age 11 to 20 years for an oldfield, coastal loblolly pine plantation with a medium productive site. In Table 9 we find a range of per acre lease values with lump sum payments from \$390 to \$625 and annual payments ranging from \$58 to \$114. The minimum estimates are based on earning a discount rate of 8 percent, plus a return to risk for growing the trees for the first 10 years. In this analysis, 8 percent is considered as a minimum return on the money invested in establishing and growing the trees. In other words, if the tree growing investment cannot produce a return of at least 8 percent, then another investment opportunity for those dollars would be chosen that would earn at least 8 percent.

The maximum estimates are based on the internal rate of return (IRR) earned by investment in the tree crop grown to age 20 years in our example. From table 2, we see that for a 20-year loblolly pine rotation on medium productive land, the IRR is 16.7 percent. Thus, the maximum lease value represents earning 16.7 percent return on the 20-year tree growing investment, minus returns for the risk of growing the trees for years 11-20 of the 20-year rotation.

Why a range for lease rates?

Remember that our estimates are made for average conditions. Our calculations show average estimated values in Coastal and Piedmont areas of Georgia where most of the CRP tree acres are located. If you have productive land, no weed competition, and good timber markets, your expected lease values could be a little higher than those shown. If your land is poorly productive, with many weeds, and low markets, your expected lease values could be a little lower than those shown. Also, your values could be higher if your stand of trees is above average quality, likewise your values could be lower if your tree stand quality is below average.

Lease bid prices are expected to vary depending on the timber market in your area. Areas with more competitive timber markets would be expected to produce better lease price opportunities, other things being equal. Other factors can also cause the lease price to vary: stand location, road access, distance to mill, etc. Lease values in Table 9 for coastal loblolly are slightly higher than those for the Georgia Piedmont.

Table 9. Coastal and Piedmont Georgia planted oldfield loblolly pine timber lease estimates for lump sum and annual payments for years 11 through 20 of un-thinned, pulpwood rotations.

Species	Site Productivity	Lump Sum Lease ¹ \$/Acre, 1997			Annual Lease ² \$/Acre/Year, 1997-2006		
20-year pulpwood		min	to	max	min	to	max
Coastal ³							
Slash	Low	363	to	460	53	to	75
	Medium	375	to	510	55	to	87
	High	390	to	565	60	to	100
Loblolly	Low	363	to	580	53	to	103
	Medium	390	to	625	58	to	114
	High	418	to	665	65	to	124
Piedmont ⁴							
Loblolly	Low	350	to	518	50	to	88
	Medium	375	to	561	56	to	98
	High	403	to	600	62	to	108

¹ Lump sum lease payment paid at the beginning of the lease period.

² Annual lease payment shown in 1997 dollars. Lease assumptions for lease calculations: Landowner pays land ad valorem taxes, retains hunting lease and pine straw lease rights. Lessee pays tree harvest ad valorem tax, prescribed burn cost and other tree stand management costs, and leaves land clear-cut at end of lease. BMP's are followed during all harvests, including those for roads and streams. Lessee assumes risk of tree loss to natural disaster, i.e. flood, fire, insects, disease, storms, drought, etc. and pays harvest ad valorem taxes.

³ 8% discount rate; 1986 Prices: PW = \$25/cord, C-N-S = \$44/cord, ST = \$164/MBF, Big ST = \$168/MBF (PW inflated at 3.5% per year, ST inflated at 4.0% per year);
1997 Price-equivalents: PW = \$35/cord, C-N-S = \$62/cord, ST = \$243/MBF, Big ST = \$249/MBF.

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1997 Price-equivalents: PW = \$24/cord, C-N-S = \$51/cord, ST = \$215/MBF, Big ST = \$232/MBF.

Regenerating after lease expiration

Questions by landowners indicate that regenerating trees after lease expiration is important. To add the value of regenerating to the lease rate, consider the following aspects. Appraise natural or planted regeneration methods. Natural regeneration is cheaper but carries more risk and may return fewer total dollars. With any tree regeneration, consider the total number of trees per acre to be regenerated and the actual distribution of the trees per acre, not the average number and distribution of trees over the total acres. For tree regeneration, site preparation, tree species, quality of seedlings planted, planting methods, density, and herbaceous weed control are important considerations. A forester can help you with these decisions.

Value of future regeneration

To calculate the value of future regeneration to subtract from a 10-year lease payment on a 20-

year rotation follow these steps:

- Calculate cost of regeneration at end of rotation. For example, regeneration cost per acre could be \$150 after a clear-cut to cover site preparation, seedlings, planting, weed control, etc.

Sinking fund formula

- Compute annual annuity value during life of proposed present lease. Using the sinking fund formula with our above example for regeneration costs of \$150 per acre, the annual value of future regeneration at the end of a 10-year lease is \$9.41 per acre.

$$a = Vn [I / (1 + I)^n - 1] = \text{Annual value of regeneration}$$

where:

a = equal annual or periodic payment

Vn = future (end) value

I = interest rate

n = number of years or interest bearing periods

$$a = 150 [.10 / (1 + .10)^{10} - 1] = \$9.41 \text{ per acre, per year.}$$

Or, use this short-cut for a 10% interest rate:

$$10 \text{ yrs.: } \$150 \times .06275 = \$9.41 \text{ per acre, per year}$$

$$10 \text{ yrs.: regeneration cost } \times .06275 =$$

$$15 \text{ yrs.: regeneration cost } \times .03147 =$$

$$20 \text{ yrs.: regeneration cost } \times .01746 =$$

$$25 \text{ yrs.: regeneration cost } \times .01017 =$$

$$30 \text{ yrs.: regeneration cost } \times .00608 =$$

- Subtract annual value of regeneration from present lease payment if lessee is to provide regeneration at the end of lease. For example, if the 10-year lease is \$85 per acre without regeneration, the 10-year annual lease rate with regeneration (with our assumed \$150 per acre regeneration cost) would be: \$85 - \$9.41 = \$75.59.

Implications for the CRP landowner

Since 1956, tree plantings from the Soil Conservation Reserve Program (Soil Bank Act) have remained almost totally in productive forest in Georgia. CRP tree plantings from the 1985-1993 period should remain likewise. Landowners can earn attractive returns from continued land use in trees on marginal cropland currently in the CRP. This is consistent with results determined by Shideed, et al. (1989) that pine plantations are more profitable on marginal row crop land in Georgia than either corn or soybeans except under the most optimistic price assumptions. Further, real prices of most agricultural crops are projected to decline whereas real tree product

prices are expected to remain constant or increase slightly (Alig et al. 1988).

Contracts for approximately 260,000 acres in the CRP in Georgia will have expired by the end of 1996. Potential investors in these pre-merchantable tree crops will likely include manufacturers in the timber industries and firms specializing in timber investments. For these potential investors, an important decision criteria would be their alternative investment discount rate. Landowners may face different alternative investment opportunities than manufacturers or investment firms.

Keeping these lands planted in trees will reduce soil erosion losses while increasing the future supply of timber in Georgia. Other benefits of keeping CRP land in trees include improved water quality, enhanced fish and wildlife habitat, reduced stream and road-side sediment, and reduced production of surplus agricultural commodities. In addition, pesticide application on forest land is greatly reduced relative to row-crop land.

Landowners can earn their greatest monetary returns by growing their own trees from planting to financial maturity. But, more landowner inputs are required to grow their own trees. Generally, fewer dollars are earned by landowners leasing their trees, but risks are reduced. Also, realize that less landowner inputs are required when leasing. However, with leasing, cash-flow is greatly improved for the landowner. Leasing remains an important option and can be a win/win experience for landowners and lessees.

Lease considerations

When examining any lease option, landowners should consider the following:

- Leasing trees is a new option -- Go Slowly.
- Check-out leasing company.
- Consider leasing only part of timberland.
- Consult a lawyer before signing any lease agreement.
- Lease only the specific resource (growing trees), not full use of the land.

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