



## Thinning Pine Plantations

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### What Is Thinning?

Thinning pine plantations is a form of intermediate cutting to improve the yield of a timber stand. Thinning is necessary because competition for sunlight, soil moisture and nutrients becomes intense as trees get larger. If the stand remains unthinned, the growth rate slows, stagnation develops and death to many trees eventually occurs. When thinning, better trees are left so that growth is concentrated on higher-value tree stems. Remove forked, crooked, suppressed and diseased trees. This is not to say that good trees should not be cut. Occasionally good trees also compete with one another and one tree must be removed.

Pine stands or plantations of about 600 trees per acre usually reach the thinning stage at 15 to 18 years of age. Plantations of higher stocking or more trees per acre on better sites may require earlier thinning.

The principal objectives of thinning are: (1) to regulate distribution of growing space for the remaining trees and (2) to utilize to the best financial advantage all merchantable timber produced by the stand. In the latter case, it may mean selling timber for chip-n-saw or sawlogs rather than pulpwood or poles rather than sawlogs if the size, quality and volume are available.

### Various Species of Pine Plantations

In East Texas, two species of pine are grown in plantations. Loblolly pine (*Pinus taeda*) is the

major pine type and is native. Slash pine (*Pinus elliottii*) has been introduced into the state.

Consider two major disadvantages of slash pine when thinning this type of plantation. The tree is susceptible to ice storms. A stand of slash pine can experience considerable damage if hit by an ice storm following a thinning. The tree is also highly susceptible to southern fusiform rust (*Cronartium fusiforme*) that forms a gall on the infected limb or trunk. During the thinning process, remove these diseased trees.

### Pine Trees Double in Value

Patience is a key factor in managing a pine plantation. Do not act too hastily in clearcutting a stand of small sawlogs. The major tree measurement is the diameter at breast height (DBH) or diameter of the tree trunk at 4½ feet above the ground. Plantations with trees 10, 12 and 14 inches in DBH may increase in volume and value at the rate of 20 percent per year or more (see table 1). For 10- to 16-inch diameter trees, the Doyle scale volume nearly doubles during each 5-year period required, on the average, to grow to the next largest 2-inch diameter class. The value also nearly doubles. For example, a 12-inch tree contains about 36 board feet on the Doyle scale. At \$200 per thousand board feet (M), it is valued at \$7.20. In 5 years, the tree grows to a 14-inch diameter with 75 board feet by Doyle's scale and is worth \$15 or more than twice its 12-inch value.

The price difference offered for clearcut or heavily thinned timber versus modestly thinned timber does not offset the loss to the grower of not

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**Table 1. Pine trees increase in volume and value with increased diameter.**

Cross section of tree .		5 years 	5 years 	5 years 
DBH	10 inches	12 inches	14 inches	16 inches
Volume per tree (bd ft)	14	36	75	132
Tree value stumpage at \$200 per M	\$2.80	\$7.20	\$15.00	\$26.40
Tree value stumpage at \$300 per M	\$4.20	\$10.80	\$22.50	\$39.60

carrying an adequate part of the stand to larger and higher-value products. Possible price increases for timber from changing use practices, such as occurred in manufacturing plywood from southern pine, may mean even greater future returns for landowners.

### **Selection Thinning**

**T**hinning pine plantations by selecting individual trees to be cut remains the best means for stimulating future timber growth and maximizing returns. In this case, trees for harvest are those that are rough, diseased, crowded, suppressed or have damaged stems.

### **Row Thinning**

**I**n recent years, the cost of logging pulpwood and labor shortages have forced many pulpwood harvesters to undertake plantation thinning by rows. The necessity to mechanize harvesting operations leads to an increase in the use of row-thinning methods. "Downed" rows become alleyways in which to maneuver the equipment (figure 1) within the plantation.

Since row thinning is non-selective, it does not improve the quality of the remaining trees. Good, dominant trees in the row to be cut are removed and poor-quality trees may remain in uncut rows. Remember that the thinning operation is allowing



*Figure 1. Mechanized harvesting operation in a pine plantation.*

the plantation to continue to grow in wood volume. Individual tree growth is not the most important consideration but rather total growth per acre is.

Considerable differences of opinion exist over how many rows to remove. It is important from the timber grower's viewpoint that enough trees remain after thinning to maintain (or nearly so) maximum per-acre timber growth. Cutting every fourth row or less (every fifth, sixth, etc.) generally does not stimulate acceptable diameter growth. Combining the cutting of every fourth row or less with selections may prove best in plantations that are not over stocked or not the most uniform and disease-free. For example, in cutting every fourth row, remove one tree out of every eight by selective

thinning to reach a desirable number of trees per acre for proper stocking.

Many foresters favor thinning every third row in the first plantation cutting. Stocking does not drop sharply and future growth approximates that from moderate selective thinning.

Some pine plantations are over stocked because they were planted at spacings of less than 6 by 8 feet and survival is higher than desired. If the plantation contains 800 trees per acre or more, removing every other row may be necessary.

Row thinning may not be appropriate if the number of defective trees in a stand is high. This is especially true in slash pine plantations where many trees may have fusiform rust cankers. Row thinning every third row leaves the same wood volume as the selective method but a higher percentage of diseased trees. Some would die before the next thinning; whereas, they would be used in the selective thinning.

### **Old Field Pines**

**F**rom time to time, naturally seeded pines (old field pines) are found in the pine plantations (figure 2). These pines should have been removed before the plantation was established, but the landowner decided to leave them. General characteristics of this type of pine include a wide crown and slick bark. The wide crown prevents direct sunlight from reaching young pine trees growing below it. Without sunlight small trees eventually die. The slick bark (figure 3) is a good sign that the tree



Figure 2. Old field pine in a young pine plantation.



Figure 3. Old field pine illustrating the slick bark appearance.

is growing very slowly. If these pines are growing in the plantation, cut them during the next thinning.

### **Thinning Is a Good Investment**

**A**s mentioned earlier, thinning improves a stand of pine timber. It also is considered a good investment by the timber grower. Strange and Montgomery<sup>1</sup> have shown that delaying thinning of pulpwood-size stands year after year has cost the landowners. A comparative study was performed showing the value of thinning pulpwood and growing the remaining trees into the more profitable sawtimber class. Results reveal that a compound rate of return of 13 percent can be realized from an unthinned stand; whereas, a thinned stand yields a 25 percent rate of return.

<sup>1</sup>Strange, J. D. and A. A. Montgomery. 1979. Advantages of improved forest management investments for the timberland owner. Georgia Forest Research Paper 2, Georgia Forestry Commission. 31 p.

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