



# TEXAS A&M FOREST SERVICE

## *Timber Management:* Thinning Pine Stands

In any timber stand, trees compete with each other for light, soil moisture, and nutrients. The more crowded the stand, the more intense the competition. In a crowded, overly-dense stand, growth rate is reduced as all trees weaken from the stress. Eventually the weakest trees die, but before they do, the entire stand is put at risk of loss from insects, diseases and wildfire. Thinning removes diseased trees, trees with poor form, slow growing trees, and others competing with the best trees.

The main objectives of thinning as a management practice in pine stands are to:

- Redistribute growth potential of the stand to trees that have potential to become high quality, valuable timber.
- Promote or improve the health and vigor of individual trees in order to reduce the risk of losing the entire stand from factors associated with crowded stands.
- Capture early economic value from diseased or poorly formed trees that would otherwise be lost before the final harvest.
- Enhance habitat for certain wildlife, as well as game species that have hunting or recreational value.

Most pine stands are even-aged. This means that all trees are within a few years of the same age. If all trees are about the same age, then larger trees are growing at a faster rate. On good sites, pines will grow more than 10% each year up, nearly doubling in volume every 7 years, until growth starts to slow around age 35 or so. Not all trees have the same value. Trees in the 6 to 8-inch diameter range are usually sold as pulpwood, OSB, chips, or low-grade lumber. Trees in the 10-inch diameter size or larger are usually sold as more valuable products, such as sawlogs, veneer, or poles.



### **When to Thin:**

The timing of a thin largely depends upon the management priorities and growth characteristics of the stand. Timing a thin to maintain the health and vigor of the stand should always be an objective. Pine stands should be thinned just before competition for limited resources causes significant reduction in growth. When this occurs prior to trees reaching a marketable size, a pre-commercial thin may be needed. Typically, the first commercial thin is conducted when trees reach pulpwood size, about 6 inches in diameter. Often, pine trees will be between 12 and 15 years old when they reach this size. Thinning operations should first remove the weak, diseased, poorly formed and damaged trees followed by selecting additional trees until the optimum stand density is reached. Another thinning should be considered 5 to 10 years later before the trees become crowded again and the growth rate slows.

A few stand condition “indicators” exist that can aid in determining when a stand should be thinned. *Live-crown ratio* refers to the percentage of the total length of the main stem that has live branches (e.g., height of the live crown

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14 feet divided by the total height of the tree 48 feet times 100 = 29%). When the live crown ratio drops to below 30%, the stand should be thinned.

*Basal area* of a stand is a common term used in forestry to describe the area of an acre taken up by an individual tree trunk. Tools such as a wedge prism can be used to help determine a stand's basal area. When the basal area is greater than 100 to 120 square feet per acre then the stand biologically is in need of thinning. Thinning back to between 60 and 90 square feet per acre is a common practice.

Another rule of thumb is to use the *D + 6 rule*. This is a method to space trees equal to the average diameter, expressed in feet. The "D" represents the diameter of a tree as represented in feet. For example, 10-inch diameter trees should be spaced approximately 16 feet apart from each other (10+6=16).

*Increment boring* is an accurate method to determine the growth rate of trees. Choose some of the better or larger trees on the site. Then use an increment boring tool to extract a core and look at the last (outside) inch. Young trees less than 8 inches in diameter should have no more than 7 rings per inch, and trees greater than 8 inches in diameter should have no more than 5 rings per inch.

## Methods:

Several thinning methods are available once it is determined that a stand should be thinned. One popular method for planted pines is termed *row thinning*. This method involves removing alternate rows (every third, fourth or fifth row) of trees from the stand. This is a simple method, but it offers little opportunity to favor good trees over poor trees.

Another popular method is *selective thinning*, a technique in which individual trees are marked for removal from the stand. Tree selection is generally based on position, form and general health. This method provides flexibility to release the best trees in the stand, but equipment operation can be difficult in dense stands and damage to the remaining trees can be significant.

A *combination thinning* method combines both row thinning and selective thinning. Row thinning makes corridors and eases access, and selective thinning then removes additional trees from between the unthinned rows.

## Conducting the Sale and Harvest:

It is strongly recommended that you use a professional consulting forester to handle your thinning. A consulting forester can inventory and mark the stand, contact and solicit bids from potential buyers, develop written harvest contracts to protect your personal interests, and oversee the thinning operation for satisfactory performance. Consulting forester fees are handled in different ways such as a percentage of the timber sale income, flat per-acre fees for marking or other arrangements suitable to both parties. Studies show that using a professional forester often results in higher revenues to the landowner, even after consultant fees are paid. To find the list of consulting foresters for Texas please go to <http://tfsweb.tamu.edu>.

## Key Points to Remember:

- Thinnings are cuttings made to stimulate the growth of remaining trees and improve the yield of the stand.
- Trees compete for light, moisture, and nutrients. If they become too crowded, growth slows and they may die.
- Pines grow rapidly, and trees grown for sawlogs are worth far more than trees grown for pulpwood.
- The result of a thinning operation should be to provide more growing space for the best trees, while harvesting diseased, damaged or dying trees.
- The first thinning is usually made between ages 12 and 15, when trees reach pulpwood size.
- Subsequent thinnings should be made before the live crown ratio drops below 30%.
- In natural stands, thinning is best accomplished by individual tree selection where each tree to be cut is marked.
- In pine plantations, a combination thinning (row thinning and selective thinning) is best. Every third, fourth or fifth row should be removed and intermediate rows thinned by individual selection.
- Thinning pine stands can have biological and longterm economic benefits.
- Get professional help and insist on the best possible logging crew in your area to do the work.