



CENTRAL HARDWOOD NOTES

Response Of Sapling Stands To Cultural Treatments

Why Precommercial Treatments?

The main reasons for precommercial cultural practices in sapling stands (trees less than 5 inches d.b.h.) are to increase growth of residual trees, increase stand value, and improve or maintain species composition. On good sites (northern red oak site index 70 and above), treating sapling stands may be justified by increased diameter growth of high value species. On fair to poor hardwood sites (northern red oak site 60 and below) cultural practices are seldom advised unless desirable pines are present.

Cleaning and Thinning Using Basal Area Guidelines

In most cases, neither cleaning nor thinning to a certain basal area are economically justified. In cleaning, poor quality trees or less desirable species are removed and no attempt is made to release selected individual trees. In thinning to basal area guidelines, overtopped, intermediate and occasionally codominant trees are removed. Generally, response is short-term because only a few trees are removed from the upper canopy. Growth will persist for 5 to 10 years if 40 to 50 percent of the basal area is removed from precommercial stands. However, the more trees cut per acre, the greater the cost and the more growth is needed to pay for the treatment. Usually basal area thinnings are not recommended in sapling stands.

Crop Tree Release

The best way to increase growth in sapling stands is to release crop trees (see Note 6.03 *Silvicultural Treatments in Sapling Stands*). Select crop trees that will make high quality sawtimber or veneer and give the crop tree crowns room to grow. By releasing 50 to 100 crop trees per acre you should be able to provide adequate trees at final harvest. Remove any dominant, codominant or intermediate tree if its branches touch or encroach on the crown of the crop tree. (However, crown branches from adjacent crop trees may touch.) Removing trees that touch usually releases the crop tree on three and often four sides.

Growth Response

The diameter growth of released dominant and codominant crop trees can be twice that of the unreleased trees for a given period. Some tolerant species such as sugar maple in an intermediate crown class position will respond to crop tree release too. The response to a precommercial treatment varies widely throughout the region. The following species are grouped based on sapling diameter growth for a 10-year period.

High
(3 inches d.b.h.)

Medium

Black cherry	Northern red oak	Hickory
Yellow birch	White ash	
Yellow-poplar	Sugar maple	
American basswood (sprouts)	White oak	
Red maple (sprouts)		

In oak-pine stands, pines generally grow the same or faster than most hardwoods, depending upon site quality. On good sites where the oak site index is 70 or above, you can select both hardwoods and pines as crop trees. However, natural succession on good sites favors the hardwoods as the pines are difficult to regenerate and expensive to develop. On fair to poor sites your management objective might often be to increase pine and reduce hardwoods. On these sites pines produce higher merchantable volumes than hardwoods. On poor sites pines will produce moderate yields while associated hardwoods will grow more slowly, yield less, and usually be poor in quality.

Bottomland hardwoods may grow very rapidly. It is not unusual for released crop trees to have an annual d.b.h. growth of 0.8 inches and a height growth of 6 feet.

Is a Precommercial Treatment Worth It?

Yes, if you release crop trees in hardwood or hardwood-pine stands where the codominant crown canopy is at least 25 feet tall, and the trees are at least 10 to 15 years old. The effect of crop tree release may last for 10 years. On the best upland sites, released crop trees could grow 3 to 4 inches in diameter in 10 years or 1.0 to 1.5 inches more than unreleased crop trees. To pay for this precommercial release, trees need to grow about 1 inch more than unreleased trees. This 1-inch response is based on a 4 percent real rate of return, inflation excluded.

What would this 1-inch difference in d.b.h. growth mean? About 35 board feet (International 1/4-inch) per tree for hardwood trees 16 inches d.b.h. with a merchantable height of three logs. For stands with 60 crop trees per acre, an early cultural treatment in sapling stands could add about 2,000 board feet per acre at the final harvest.

In summary, for sapling stands:

1. Concentrate cultural practices on the best sites. Marginal and poor sites will not produce enough growth to pay the costs.
2. Select crop trees that will make quality sawtimber and veneer.
3. Give the crop trees room to grow by removing all trees (except other crop trees) that touch their crowns. The trees will respond.

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