



TEXAS A&M FOREST SERVICE

Timber Management: Harvest Strategies for Pine Regeneration

The final harvest of a stand will have an impact on regeneration or reforestation. A landowner can reduce the unintended consequences on a future pine stand by planning ahead. Natural regeneration is often a viable option in East Texas, but a productive stand will likely not occur by simply cutting the trees and walking away. Likewise, the costs of artificial regeneration can be reduced by taking care during the harvest process.

For the artificial regeneration of pine, the final harvest can be done in one step. If a landowner is planning for a pure pine stand after reforestation, care should be taken to harvest and utilize all the trees in the current stand. Finding ways to utilize the limbs, tops, and other slash during the harvest will help reduce the costs involved with site preparation for planting.

For natural regeneration, there are two harvesting systems typically used in the Southeast. These include 'Seed-Tree' and 'Shelterwood'. Both involve a two-phase final harvest. They typically do not reduce your overall harvest profit, and they give the landowner an opportunity to receive income 5-10 years later while pine seedlings are getting established.



Seed-Tree Harvest for Natural Regeneration:

This method of harvesting leaves approximately 6 – 10 well-spaced, good quality residual trees per acre to provide for natural regeneration of pine stands. This method works best with light-seeded softwood species such as loblolly and slash pine.

Monitor the stand for germination of seedlings after seed fall. Once advanced regeneration becomes established and trees are at least five feet tall and two years old, harvest the overstory. Consult a professional forester for guidance on when to remove the overstory. To find the list of consulting foresters for Texas please go to <http://tfsweb.tamu.edu>.

Shelterwood Harvest for Natural Regeneration:

This method uses two or more successive cuttings so residual trees provide protection from sun and wind during the period in which a new crop of trees is established. This system regenerates heavy-seeded species (oak and longleaf pine) intolerant to shade or species with intermediate shade tolerance by allowing sunlight in to promote growth. When removing merchantable timber, leave 20-60 well-spaced, good quality residual trees per acre. Leave the best trees to grow for another 5-10 years as advanced regeneration is establishing. After thinning, the forest floor should receive enough light for seed from residual overstory trees to germinate. Consult a professional forester for guidance on when to conduct subsequent harvests.

Selecting Trees to Leave for Natural Regeneration:

Wind firmness is a primary consideration when selecting a residual tree, because the suddenness with which the protection of the rest of the stand is removed makes trees particularly susceptible to wind-throw. The most wind firm

Timber Management: Harvest Strategies for Pine Regeneration

trees are grown with relatively little competition on deep soils and have stocky, tapering boles with well-developed root systems. Such trees also have wide, deep crowns and relatively large live crown ratio.

The force of the wind increases rapidly with distance above ground; short trees are less susceptible to damage than tall trees with the same proportional development of crown. Trees with wide, horizontal openings between branches are more likely to stand against wind than those with compact crowns. The Seed-Tree method should not be used with shallow-rooted species, or species with wood of low strength. It is not applicable to any species growing on moist or thin soils where the rooting stratum is shallow.

Residual trees must be old enough to produce abundant fertile seed. Residual trees should also be selected from among the dominants and better co-dominants. Such trees are stronger and usually produce more and better seed than trees of the lower crown classes.

Consider the following when determining the number and distribution of residual trees:

- The amount of viable seed produced per tree.
- The probable proportion of residual trees that will survive.
- The percentage of seed that will finally produce established seedlings.
- The distance to which seed can be dispersed in sufficient quantity to ensure full stocking.

The following table provides the minimum recommended number of residual seed trees per acre to leave based upon pine tree species and diameter (DBH) in inches.

	Shortleaf	Loblolly	Slash	Longleaf
10	20	12	12	55
12	14	9	9	38
14	12	6	6	28
16	12	4	4	21

Site Preparation for Natural Regeneration:

During late summer to early fall (prior to the first seed fall), implement a prescribed burn to expose mineral soil and allow a better seed catch. Pine seed germinates and survives better when in direct soil contact. It is important to control hardwood competition either before the initial cut through controlled burning or after harvest with herbicides.

Monitor the Number of Seedlings that Persist:

Before removing the residual trees and performing the final harvest, make sure you have enough new pine seedlings to reforest the site. The desired stocking rate after the first growing season of the new pine seedlings is between 1000 and 3000 seedlings per acre. The desired stocking rate after the second growing season of the new pine seedlings is between 500 and 800 seedlings per acre. Natural regeneration often results in too many seedlings. If so, a landowner can plan strategies to implement a pre-commercial thinning.

