TreeLines

July 2024 – 1st Edition

Improving Thinned Loblolly, Longleaf, & Slash Pine Stand Growth With A Herbicide Or A Fertilizer Treatment – Making The Right Choice

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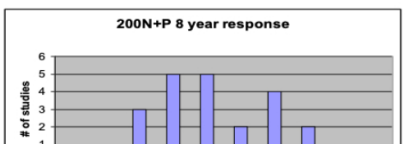
Fertilizers and herbicides have been applied to 500,000 to over 1,500,000 acres annually in the southeastern United States over the last 50 years. Thinned loblolly, longleaf and slash pine stands often respond to a woody competition control treatment and/or a fertilizer treatment. Deciding which treatment may be the best choice depends on several factors: (1) land use history: former farmland, pasture, hay field (old-field sites) or land that has been in trees since the 1930's or 1950's (cutover sites), (2) cost of the treatment, (3) each pine species anticipated probability of growth response, (4) the magnitude and duration of the response of each species, (5) the type and abundance of woody competition, (6) whether the stand will be thinned or clearcut 5-10+ years after the treatment, (6) and projected pine stumpage prices when the stand is harvested.

Photo 1. A young, recently thinned slash pine stand with a high level of woody shrub competition (greater than 75% ground cover). An herbicide treatment would be the first option prior to fertilization with the high level of woody shrubs if the stand is not going to be harvested for eight or more years.

If the current thinned pine stand was planted on former farmland (previous crops were corn, cotton, soybeans, peanuts and a winter grain), pastures or hayfields then fertilization will most likely not significantly improve pine growth. Conversely, on cutover sites than have been in trees without fertilization for 50+ years, pine response to fertilization can be large. Loblolly pine tends to be the most responsive to both fertilization and woody release (via an herbicide treatment) being 20-25% more responsive than slash pine and 25-35% more responsive than longleaf pine. If the thinned pine stand has an understory of waxmyrtle, gallberry, titi, fetterbush and saw palmetto in the Coastal Flatwoods and the percent ground cover of these shrubs is greater than 33-50%, then a herbicide treatment would be recommended prior to fertilization (Photo 1). If the pine stand has mixed hardwoods (sweetgum, oaks, hickory, maples, etc.) with diameters greater 1-2 inches and greater than 200-400 hardwoods per acre then a herbicide treatment would be recommended prior to fertilization.

Pine stand response to fertilization and herbicide can vary widely. A single mid-rotation nitrogen and phosphorus (NP) fertilizer application in a loblolly pine stand can vary greatly (Figure 1), from very little growth gains (0.1-0.5 tons per acre per year) to very large gains (1.5-3.0 ton per acre per year for loblolly pine). The response following a single herbicide treatment can vary greatly as well, from insignificant gains (0-0.35 tons per acre year) to very large gains (0.9 to 1.35 tons per acre year) based on loblolly and slash pine studies.



Current (2023) herbicide costs range from $65 to $100 per acre based on competing vegetation species, size and abundance, the herbicides used, and if ground or aerially applied. Current fertilizer prices for a NP application (the most common fertilizer treatment for pines) range from $130 to

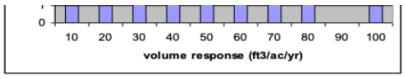


Figure 1. Loblolly pine mid-rotation volume/ac/yr response over an eight year period histogram showing the number of study sites that had a 10-100 ft3/ac/yr response (from NC State University Forest Productivity Coop Regionwide study summary report 1998). One ton of Southern pine wood+bark is approximately 32 cubic feet.

$200 per acre. Adding potassium (K) fertilizer to a NP application increases the cost by $35-$40 per acre where K is needed.

Loblolly, longleaf and slash pine response to a mid-rotation fertilizer treatment tends to peak four years after application and can last six to eight years. The pine response to a woody control herbicide treatment tends to peak six to eight years after application and can last 12-14 years.

If the woody competition in the thinned pine stand is low (below 200-400 hardwoods per acre or below 33-50% ground cover in the Flatwoods, Photo 2) and it is a cutover site that has been in trees for over 50 years then soil and foliage sampling, summertime leaf area index estimates, and soils knowledge are diagnostic tools to determine if the stand is deficient in N, P and/or potassium (K). If the woody vegetation is above the noted thresholds, then the herbicide treatment is the better choice, as the woody vegetation will take up some of the nutrients applied making it more competitive.

If the thinned stand will receive a second thinning rather than a clearcut (harvesting 100% of the merchantable timber), then the herbicide treatment is the better choice if the woody vegetation is above the hardwood or shrub threshold level discussed previously. Then after the stand is thinned the second time, a fertilizer treatment may be a good option if the next cut is the final harvest.

If you have questions about fertilization or herbicide use to control woody vegetation in mid-rotation, post thinning pines stands, contact outreach faculty members Dr. David Dickens or Dr. David Clabo at UGA Warnell School of Forestry and Natural Resources.

Photo 2. A recently thinned slash pine stand with a low level of woody shrub understory cover (less than 25%) This site could be fertilized if the diagnostic tools used for fertilization indicate a high probability of response to fertilization and if the stand is planned to be harvested in 4-8 years. The ground cover in the photo is mostly herbaceous vegetation which will not compete significantly with mid-rotation pines.

Special Announcement For South Carolina Landowners

The South Carolina Forestry Commission (SCFC) and ArborGen are partnering to make a special offer to South Carolina Forest Landowners conducting reforestation in 2024/25. Open-Pollinated (OP) Loblolly Pine, Longleaf Pine, and a host of ArborGen select hardwood species will be available at discounted pricing, resembling the program previously offered by the SCFC and ArborGen at Taylor Nursery.

This program is specific only for South Carolina landowners, and those interested in obtaining seedlings through this discounted program can call the ArborGen Blenheim Nursery at 1-800-222-1290.

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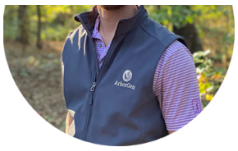

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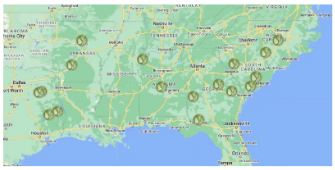

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