

Opportunities for Fertilizing Pine Plantations

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Fertilizing pine plantations has captured the attention of forest landowners across the South. While the majority of stands receiving fertilizer treatments are on forest industry lands, private nonindustrial landowners are increasingly willing to consider fertilization. Growth benefits can be gained from fertilizer applications, but a good prescription is needed to insure economic response as growth responses can vary greatly across soil and drainage classes. Before you begin any fertilization program consider several points. First, control of herbaceous and woody competition is critical if you expect to gain the best growth from any stand. Freeing up site resources from competing vegetation allows trees to use available growing space, water and light and is an essential prerequisite. Good site preparation, and herbaceous weed control are the best investments can make to maximize production. In older stands, woody competition must also be controlled before starting a fertilizer program. Second, determine your management objectives, are you trying to maximize fiber production in short rotations? If so, you may want to practice intensive management which includes competition control and fertilization.

Do you wish to produce sawtimber in longer rotations? Here fertilizer can be applied following a thinning operation to maximize growth of the selected crop trees. Is pine straw production an option? Periodic applications of fertilizers may be needed to replace some of the nutrients removed in harvesting of pine straw. Finally, how much can you spend to manage your stands? Applications of fertilizer and other intermediate treatments must be evaluated to fit into your cash-flow structure.

Two commonly used treatments are fertilization of phosphorus (P) deficient wet "flatwoods" sites at the time of planting, and mid-rotation application of nitrogen (N) alone or N+P. Some intensively managed industrial pine plantations are receiving multiple applications of N or N+P during the rotation in effort to maximize fiber production and reduce rotation length.

Fertilization with P on wet "flatwoods" sites is often critical to insure stand establishment and growth. This is normally done during the site preparation and bedding operation using ground rock phosphate, triple super phosphate, and ordinary super phosphate. P applied at planting has a long lasting response of 15 to 20 years. Trees in young stands on many unfertilized wet sites exhibiting sparse yellow foliage, and poor growth and survival may be P deficient. A foliar nutrient analyses can confirm the problem, and P can be broadcast over the stand.

Mid-rotation fertilization using N, with P in some cases, has been done on a variety of sites over the years. A common practice is to fertilize with N (urea, or urea + diammonium phosphate if P is required) following a thinning operation. Today, we see N applications being made at younger ages when the tree canopies begin to close at 8 to 10 years of age. Some operations are considering multiple application of N fertilizer in short ~15 year rotations to maximize pulp production. The response to N fertilization cumulates in six to eight years so the gain must be captured by thinning or harvest before natural stand mortality occurs.

Soil characteristics, foliar sampling in existing or adjacent stands, and the overall foliage density and vigor are important diagnostic attributes to prescribe a fertilization program. In some cases fertilizers may make the difference if getting a stand established as in the case of P deficient wet sites, or fertilizers are being used in combination with other silvicultural treatments enhance stand growth. Good competition control must be achieved if fertilization is to be economically justified. Check with consulting, industry, state, and extension foresters for specifics regarding integrating fertilization into your pine plantation management program.

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