

Forest Fertilization Speakers Notes

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The Entomology and Forest Resources
Digital Information Work Group

Comments on Forest Fertilization

- Fertilization has dramatically increased with more than 1.5 million acres of loblolly pine and 1 million acres of slash pine receiving fertilizer treatments.
- Fertilization can allow pine stands to dramatically increase productivity as part of a comprehensive management plan.
- Phosphorus is often critical for seedling establishment & growth on wet flatwoods sites.
- Nitrogen can become limiting when tree crowns are rapidly expanding at ages ranging from 5 to 10 depending on management.

Fertilization at time of planting

- P most commonly applied to poorly drained soils, although some Upper Coastal Plain loam and clay soils are P deficient.
- Average response of 50 cubic feet per acre per year (90 cubic feet to a cord).
- Apply 40 to 50 lbs of elemental P at planting.
- Time of application is not critical, but generally done when beds are prepared.
- P may be broadcast, side dressed, or banded.
- Triple Super Phosphate (TSP) which has 20 % P is most commonly applied.

Mid-rotation fertilization

- N or N + P applied to stands beginning at age 5 in intensive management, or following thinnings.
- Common treatment is 200 lbs of N + 25 lbs of P, when P is low in foliage (<0.09%) or soil (8 -12 <3 lbs/ac) & foliage has a high N to P ratio (>11).
- Use 150 to 200 lbs of N alone if foliar N is low (<1.0%) but P is adequate, & the foliar N/P ratio is low (<10.5).
- Apply 25 lbs of P alone if foliar P is <0.085% and the foliar N/P ratio is high (>13). 200 lbs of DAP is a good treatment here as well.
- Timing of N is in the spring or fall. N applied in the summer may be leached out of the rooting zone by summer rains or be volatilized by dry soil conditions & high temperatures.
- Pine straw production (needle yield) can be increased 40 to 50% two years following fertilization

Impacts on wood quality

- Generally, specific gravity is not affected by fertilization.
- Most intensive management aimed at short-rotation fiber production.
- Rapid growth leads to large juvenile core & fewer rings per inch which may limit some solid wood product applications.

¹1997. Forest Fertilization Speakers Notes. Georgia Cooperative Extension Service, College of Agricultural and Environmental Sciences, The University of Georgia, Athens, GA 30602 U.S.A.

Fertilizers

- Phosphorus - Triple Super Phosphate (TSP) & Ground Rock Phosphate (GRP) most commonly used at planting. Diammonium Phosphate (DAP) at planting makes weed control essential.
- Nitrogen - Urea & Ammonium Nitrate.
- Nitrogen + Phosphorus-Diammonium Phosphate (DAP) at mid-rotation.
- Overall, little differences in fertilizer sources. Cost is generally the overriding consideration.
- Chicken litter - perhaps difficult to uniformly apply, but a good option.

One dry ton of litter supplies:

56 lbs of N

17 lbs of P

40 lbs of K

Foliar Sampling

- Take samples from January through March
- Collect needles from a primary lateral branch in the upper 1/3 of the crown.
- Pull foliage (include needle fascicles or sheaths) from the first growth flush of the season.
- Make a composite sample from 6 to 7 trees.
- Keep samples on ice until they are sent for analysis.
- The University of Georgia (check with your county extension agent) or private labs can run foliar analyses.

Fertilizer sources for forestry use			
Source	% N	% P	% K
Urea (46-0-0)	46	0	0
Ammonium Nitrate (33-0-0)	32.5	0	0
Diammonium Phosphate DAP (18-46-0)	18	20	0
Triple Super Phosphate TSP	0	20	0
Ground Rock Phosphate GRP	0	11-13	0
Potassium Chloride (0-0-60)	0	0	50
Potassium Sulfate (0-0-53) (18% S)	0	0	44