

## *Does Fertilization of Unthinned Loblolly Pine Pay Dividends?*

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### QUESTIONS OF INTEREST

1. How does a stand of loblolly pine respond to different mixtures of commonly applied fertilizers?
2. What effects will the different mixes of fertilizer have on pine straw production?
3. Does it pay to fertilize a loblolly pine stand?

### DATA FROM THE FIELD

#### *Stand & site characteristics*

A forest stand in Twiggs County, Georgia was clear-cut in 1987 and replanted with loblolly pine in 1988 after intensive site preparation and removal of the stumps. Bare root seedlings were planted on a 6 x 10 foot spacing (728 trees/acre). The soil series of this area was verified by the Natural Resources Conservation Service (NRCS) as Norfolk and Orangeburg (Typic Kandiudults). These are good soils to grow southern pines.

#### *Application of fertilizer*

Three fertilizer treatments were applied in February of 1999 (stand age 11-years-old): (1) control (no fertilizer); (2) 185 lbs N + 25 lbs P fertilizer per acre; and (3) 200 lbs N + 50 lbs P + 50 lbs K per acre. The main source of nitrogen (N) was urea (46-0-0), diammonium phosphate (18-46-0) provided both N and phosphorous (P), and muriate of potash (0-0-60) provided potassium (K). The fertilizers were broadcast applied using a tractor and cyclone spreader.

#### *Stand measurements*

The diameter and height of approximately 800 loblolly pine trees were measured at stand ages 11-, 14-, and 15-years-old. Total volume and merchantable volume of pulpwood, superpulp, and chip-N-saw were estimated. The pine straw was hand raked starting in the Spring of 2001.

### RESULTS

The following information represents analysis of data collected between 1999 and 2004. Results from this study should be used as a guide only. Remember, growing timber is an art and science, and your results may vary.

### ***Tree growth***

**Key Issue:** Application of N+P and N+P+K fertilizer increases wood volume growth.

Diameter growth of the fertilized trees over the four-year period showed a significant increase over the control. The N+P treatment had a 0.34 inch increase over the control and the N+P+K treatment had a 0.24 inch increase over the control. There were no significant height growth benefits from the fertilizer treatments. Volume per acre was increased

Both fertilizer treatments increased stand volume (by 235 and 185 cubic feet per acre or 5.5 and 7.1 tons per acre with the NP and NPK treatments, respectively). Trees that would have been harvested for pulpwood moved into the superpulp class, and superpulp moved into chip-N-saw class. This equates to an increased wood volume value of \$180 (NP) and \$164 (NPK) per acre.

### ***Pine straw production***

**Key Issue:** Application of N+P and N+P+K fertilizer increases pine straw production.

When production numbers were totaled for the three rakings (at age 12-, 13-, and 15-years), the N+P treatment produced 178 more bales than the control and the N+P+K treatment produced 260 more bales than the control.

### ***Economics of fertilization***

**Key Issue:** The cost of fertilizer fluctuates and has an impact on the economic returns you may realize from growing timber and raking pine straw.

When applied in 1999, the N+P fertilizer and application cost was \$78.19 per acre and the N+P+K cost was \$110 per acre. The revenues (extra wood and pine straw value) were \$225 (N+P) and \$229 (N+P+K) per acre, and the calculated internal rate of return (IRR) for these treatments yielded 30.2 percent and 20.1 percent, respectively. However, when the IRR was calculated using October 2005 prices (South Georgia), the IRR for the N+P and N+P+K treatments dropped to 15.5 percent and 7.7 percent, respectively. These returns represent a respectable return on your investment.

## **APPLYING THE RESULTS**

Volume growth and pine straw production of loblolly pine trees growing on Norfolk and Orangeburg soils in this study increased when fertilized with N+P and N+P+K treatments.

To ensure fertilization is a wise investment for your forestland, you should analyze your stand conditions (soil and foliar analysis) first and seek the assistance of a professional forester.

### ***Recommended actions***

Know what you are dealing with!

- Determine the soil type of your land! Submit foliar and soil samples for analysis and interpretation, and estimate leaf area index prior to investing in any fertilization activities. There may be a small charge for the testing services, but it will save, and possibly make you money in the long run.

- Contact your local extension service office, state forestry agency, or consulting forester for assistance. A professional forester can help you interpret the test results and advise you of the appropriate actions to take next.

### ***Investing in the future!***

- The cost of the fertilizer and application should be thoroughly investigated. The cost of the fertilizer and application is variable so shop around for the best price and most experienced applicator.
- The total cost of application will depend on the method (broadcast or aerial) and current market value of the bulk fertilizer products. Get bids for “package” jobs that include the product and application.
- Contact the state forestry agency and request a list of contractors. The contractors will often have a supplier they work with to get the fertilizer.
- Ask contractors to submit a bid for the job. Check contractor references and verify their qualifications and insurance policies. Involve a professional forester in this process.

### ***Take your time!***

- Pine straw contractors and markets vary so thoroughly investigate both before signing a contract to avoid disappointment.
- Contact your state forestry agency and request a listing of pine straw contractors and producers in your area.
- Make arrangements to visit other producers to observe their operation and talk about how they manage their forestland to maximize production.
- Arrange to meet with several contractors and have them look over your forest stand. Ask them to submit a bid and involve a professional forester in the process.
- Once you are satisfied and have selected a contractor, draw up a contract and rake away. Keep in mind that the value of your straw depends on the condition of your stand. A stand that is clear of underbrush and the straw does not have excessive amounts of woody debris will receive a better price.

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## **CITATION**

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