

## RESPONSE OF VIRGINIA PINE CHRISTMAS TREE PLANTATION TO FERTILIZATION

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Commercial production of Christmas trees has recently become a reality in Louisiana. Virginia pine (*Pinus virginiana* Mill.) is the most suitable Christmas tree for growers in the state. Because of the long growing season and abundant rainfall in Louisiana, the trees normally reach commercial size within 5 years. However, the shorter the time it takes to grow the trees to merchantable height the lower the production costs.

One of the possibilities for reducing the length of time required to produce merchantable trees is to use fertilizer to increase tree growth. This paper gives the results of a fertilizer experiment designed to test height-growth response to various rates of fertilizer applied to a young Virginia pine plantation in southeastern Louisiana.

### Methods

A Virginia pine plantation was established in February 1976 on Ruston fine sandy loam soil, which is well drained, moderately permeable, medium acid in the surface layer, and strongly acid in the sandy clay loam subsoil. Seedlings for the study were genetically improved 1-0 stock from an Alabama commercial nursery. They were planted on a 6- by 6-foot spacing.

The total area of the plantation was about 1 acre. Four fertilizer treatments (A, B, C, and D) and eight replications were used—a total of 32 plots containing 36

seedlings per plot. The fertilizer, commercial grade 8-8-8, was applied by hand on the soil surface around each tree in April 1977, and at the beginning of the second growing season in the field. Fertilizer rates in pounds per tree were: 0.8 (treatment A), 0.4 (treatment B), 0.2 (treatment C), and none (treatment D).

The plantation was mowed regularly during each growing season to reduce weed and grass competition. To eliminate border effects, the 16 seedlings in the center of each plot were selected for study, and their heights were recorded at the end of the first and second growing seasons in the field.

Second-year height growth for each tree that survived the second growing season was determined by subtracting first-year height from second-year height. Data were then subjected to analysis of variance.

### Results and Discussion

The survival rate of the seedlings was excellent (96.1 percent at the end of the first year and 95.3 percent at the end of the second year). Treatments had no measurable effects on survival.

Fertilized seedlings generally appeared greener and more attractive than unfertilized trees.

Fertilizer application at all three levels significantly improved second-year height growth (table 1). Although the greatest height growth was achieved at the high-

**Table 1.**—Height growth of fertilized Virginia pine seedlings

Treatment	Fertilizer rate per tree <sup>1</sup>	Average second-year height growth <sup>2</sup>
	pounds	inches
A	0.8	31.8a
B	0.4	30.9a
C	0.2	28.9b
D	None	25.0!

<sup>1</sup>Trees were fertilized at the beginning of the second year in the field.

<sup>2</sup>Figures within a column followed by the same letter are not significantly different from one another (Duncan's Multiple Range Test,  $p = 0.05$ ).

est fertilizer rate, 0.8 lb per tree, there was no significant difference in growth between this rate and the next lower rate (0.4 lb per tree). This indicates that addition of fertilizer beyond 0.4 lb per tree is not likely to improve tree growth.

The height growth improvement associated with fertilizer was 3.3 inches (13 percent) for treatment C and 5.3 inches (21 percent) for treatment B. If the 21 percent difference is maintained for the next 2 years, there is a strong probability that the use of 8-8-8 fertilizer at 0.4 lb per tree on this kind of site will make it possible for growers to harvest merchantable trees 1 or 2 years earlier than normal.