

## INITIAL PROGRESS OF A COTTONWOOD PLANTATION IN THE PIEDMONT OF SOUTH CAROLINA

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In March 1963, a cottonwood (Populus deltoides Bartr.) plantation was established to permit the start of an exploration of the economic and biological possibilities of fast-growing hardwood plantations on fertile river bottom soils in the Carolina Piedmont. These soils are natural hardwood sites that were expected to be very favorable for hardwood plantations.

Abundant literature exists on successful cottonwood plantations along the Mississippi River, and McAlpine (1) has reported encouraging growth information and also some effects of injurious agencies in a Georgia Piedmont plantation. However, there have been relatively few announcements of experimental results in the Carolina Piedmont. Because of cottonwood's increasing value and use, it is desirable to ascertain potential plantation development and growth for this area.

### Planting and Cultivation

The site for our first test plantation is on the Catawba River bottom at our company seed orchard. The soil is a well-drained, fine sandy silt loam alluvium: Cottonwood grows well naturally along this river bottom, and this site was considered ideal for the species. The site was previously cultivated, and it was disked in the fall of 1962.

Planting was done in March 1963, with unrooted cuttings from the Mississippi Delta and local cuttings from sprouts near the planting site. The cuttings were planted in holes punched 16 inches into the ground with homemade iron rods (fig. 1). A 5/8-inch-diameter rod was used to set the Mississippi Delta cuttings. A 3/8-inch-diameter rod was used to plant the smaller local cuttings. Plantings were spaced 9 by 9 feet apart.

A regular cultivation program was scheduled to control weeds and conserve soil moisture. The plantation was thoroughly cross-disked and hand-hoed monthly, starting in April. Four-foot-square patches of mulching paper were prohibitively expensive and were ineffective in retarding weed competition. Irrigation, fertilization, and insecticide application were not used.

Two insect species damaged the young trees of the plantation and those of nearby natural cottonwood. Most harmful was a stem and twig borer that prevented development of many of the local cuttings early in the growing season. In late summer a leaf defoliator stripped the leaves to the veins and midribs. The black larvae fit the description Maisenhelder (2) gives for the cottonwood leaf beetle (Chrysomela scripta).

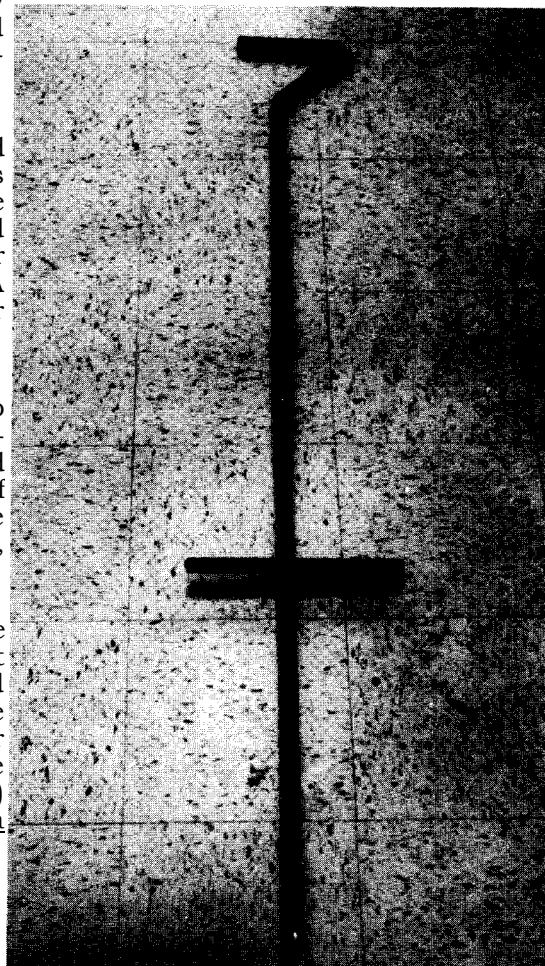


Figure 1.--Iron rod made for planting cottonwood cuttings.

## Survival and Growth

The survival of the Mississippi cuttings at the end of the first growing season was fair (79 percent). The average height growth was 2.5 feet. The tallest seedlings were 5 to 6 feet in height (fig. 2); the shortest seedling was 1 foot tall. However, the average height growth was less than expected, particularly for such a high-quality site as the Piedmont. The two primary reasons for poor height growth were probably severe Johnson grass competition and a long summer drought. Height growth was closely correlated with soil moisture conditions. Those cuttings planted on the wettest spots grew the tallest.

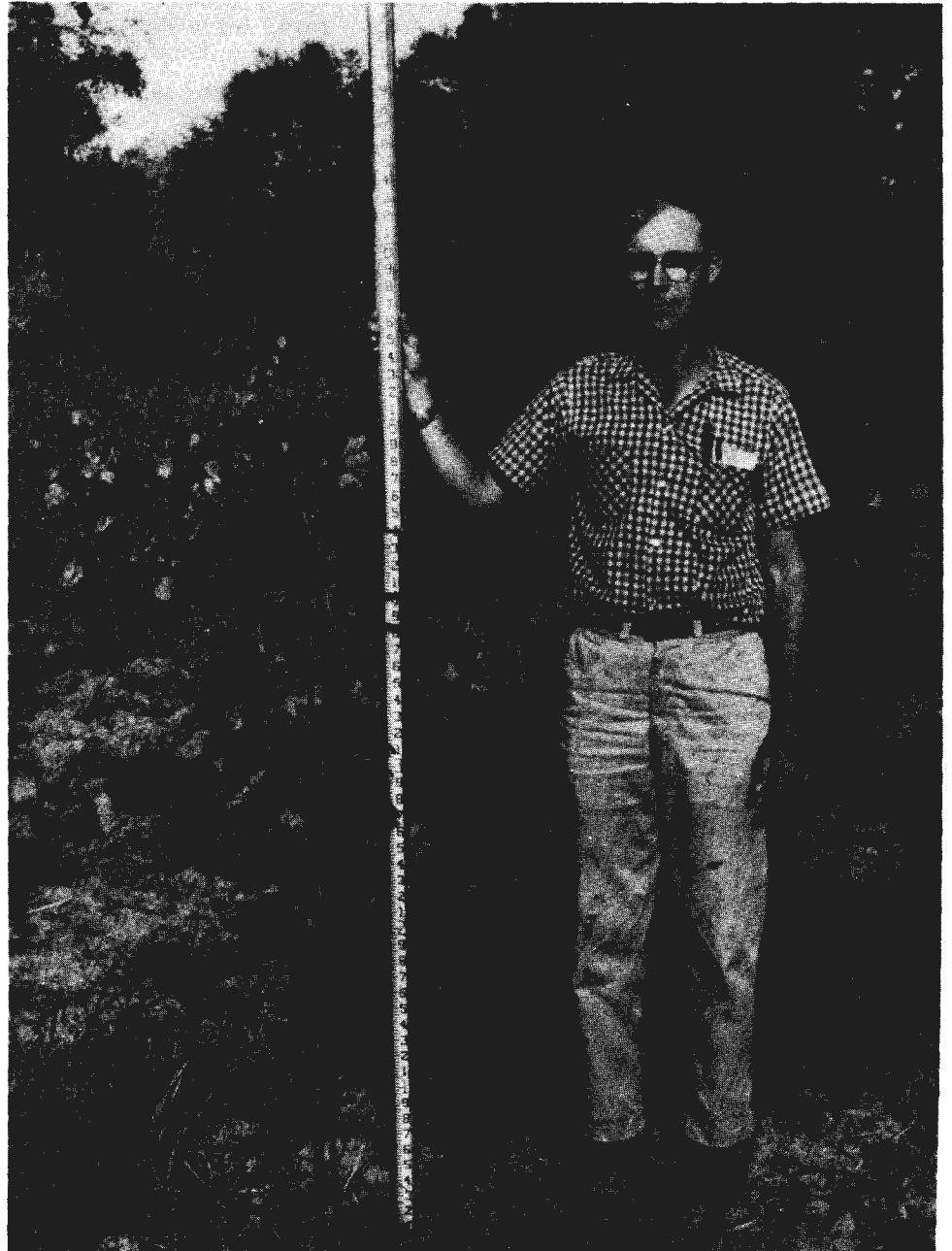


Figure 2.--A 5-foot cottonwood in a plantation that averages 2.5 feet in height.

Survival of the local cuttings was only 6 percent. These cuttings had an average height growth of 1.6 feet. The local cuttings when planted were approximately three-eighths inch in diameter. Their small size, the severe twig borer damage, and dense Johnson grass competition were probably the main reasons for failure of the local cuttings.

After hearing so much about the successful cottonwood plantations of the Mississippi Delta, our results in the Piedmont are disappointing; however, we hope to continue cottonwood test plantings on carefully selected sites. The problems encountered on this young plantation should not discourage further Piedmont cottonwood operations. These initial results indicate the great importance of favorable soil moisture, a suitable site, and intensive cultivation to the success of Piedmont cottonwood plantations.

#### Literature Cited

- (1) McAlpine, R. G. 1963. Problems with cottonwood planted in the Georgia Piedmont. U.S. Forest Serv. Tree Planters' Notes 57, p. 5.
- (2) Maisenhelder, L. C. 1960. Cottonwood plantations for Southern bottom lands. U.S. Forest Serv. South. Forest Expt. Sta., Occas. Paper 179.