PROBLEMS WITH COTTONWOOD PLANTED IN THE GEORGIA PIEDMONT

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Native cottonwoods (Populus deltoides) grow rapidly and to large size on good bottom land sites in the Piedmont. Annual diameter growth of over 1 inch and height growth of 10 feet or more are not unusual during early years. McKnight and Maisenhelder describe the rapid growth of cottonwood plantations in the Mississippi Delta in an article "Change to Quick Trees" appearing in Tree Planters' Notes 51, April 1962.

Despite the promise of fast growth and early returns, difficulties may be encountered in planting and growing cottonwood in the Piedmont. Some of the difficulties are peculiar to certain areas, and others are commonly associated with any planting. Examples of problems that may arise are found in experimental plantings in the Piedmont of Georgia.

For 3 successive years, beginning in 1956, small plantings of cottonwood cuttings were made along the Oconee River in Greene County. Planting stock originated in the Mississippi Delta. During six seasons, the oldest planting (1956) has grown to an average height of 45 feet, with two trees exceeding 60 feet (fig. 1). Diameter growth measured at breast height averaged 5 inches, with the largest tree reaching 8 inches. Height growth compares favorably with plantings in the Mississippi Delta, but diameter growth is somewhat less.

The importance of site selection has been demonstrated by the relative growth rates of the three plantings. The plots are perpendicular to the river course, the oldest

Figure 1.--Planted cottonwoods average 45 feet in height at 6 years of age, with two trees exceeding 60 feet.

planting occupying the rather high outwash of deep, moist, and well-drained alluvium nearest the river. The 1957 planting, although adjacent, is located in a slight depression, where soils are heavier and surface drainage is impeded. The 1958 or youngest planting is near the outer edge of the bottom land. Here the alluvial soil is relatively shallow, and moisture conditions are less than optimum. Average annual height growth for the three plantings has been respectively 7.5, 5.5, and 2 feet. This is probably typical of variation in growth that may be expected in the rather narrow bottom lands of Piedmont rivers.

In 1958, a prolonged cold spell caused the bark to split on a number of trees in the 1956 planting. During the early part of the following growing season, damaged trees began to die. Two fungi, Dothichiza populea and Cytospora chrysosperma, were isolated from dying trees. Both of these fungi are frequently destructive to poplar plantings. All damaged trees were removed and burned, and no further infection occurred.

Beavers have been more destructive than any other single agent. As many as 35 trees were cut in the 1956 planting during a single week, and the 1957 planting was almost completely clear cut after 4 years of relatively little damage (fig. 2). Of control measures attempted, only screen wire placed around the base of trees has been effective (fig. 3). During periods of flood, however, the beavers have swum out and have cut trees above the wire, leaving stumps as high as 6 feet. Beavers will cut or girdle cottonwood irrespective of size, and to be effective control measures must continue for the entire rotation.

Deer damage to the two older plantings has been negligible because deer were just being introduced into the area during 1956. Severe browse of slow growing trees in the 1958 planting, however, reflects the rapid increase in deer population. On the better sites, trees should grow beyond the reach of deer within 1 or 2 years.

The cottonwood leaf beetle is capable of completely defoliating young trees. It has been particularly troublesome in nursery stock beds, but has not damaged outplanted trees sufficiently to warrant control. Spraying with DDT in water solution provides adequate control, and as trees grow older and larger the risk of damage from this insect largely disappears.

Figure 2.--Beavers almost clear cut this 4-year-old cottonwood plantation during fall of 1960.

Figure 3.--Screen wire stapled around the base of each tree provides protection from beavers.

The problems that have developed during the short history of these plantings should not discourage cottonwood planting in the Piedmont. With the exception of beaver damage, the difficulties are minor and can be overcome by wise choice of planting site and reasonable care during the early life of the plantation. Where evidence of beaver damage exists, however, difficulties must be expected, and the additional expense needed for protection should be considered before planting trees.