SEEDLINGS AS GOOD AS TRANSPLANTS FOR COTTONWOOD PLANTING

RICHARD C. SCHLESINGER and CLIFFORD 0. NASHLAND[1]

Interest in establishing eastern cottonwood plantations has emphasized the lack of information on the best methods for managing this species. Southern European foresters favor using 3-year-old planting stock, deep planted and intensively cultivated.

In southern Illinois a study was designed to compare the growth and survival of 1-0 seedlings with 1-1 and 1-2 transplants on a well drained flood plain.

Procedure

The planting area and a temporary nursery adjacent to the study area were bushhogged and deep plowed in both the fall of 1962 and 1963. Each test area was also double disked before being planted. In the fall of 1963, 1-0 seedlings were planted in three 68-tree blocks; at the same time 1-0 seedlings for the production of 1-1 and 1-2 transplant stock were planted in the temporary nursery. The soils in the nursery and planting area are moderately well drained silt loams underlain by sand and gravel at approximately 50 inches.[2] All areas were uniformly fertilized annually and clean cultivated for 5 years beginning in 1964.

The 1-0 seedlings were planted at a 14- by 14foot spacing in the field and at a 2.5- by 14-foot spacing in the nursery. The lateral roots were pruned to 2-inch stubs before planting, and the tops cut off at ground line after planting. The 1-1 and 1-2 transplant trees were planted in the fall of 1964 and 1965, respectively, after the lateral roots had been pruned to 2 inches, and all lateral branches has been removed. All study trees were hand planted in 30inch-deep auger holes. Three blocks of 68 trees each were planted each year.

1 Associate silviculturist and assistant silviculturist (retired), respectively, North Central Forest Experiment Station, USDA Forest Service.

2 Predominantly the Sharon (80-percent) and Belknap (11-percent) soil series.

Results and Discussion

At the end of the 1969 growing season, the 1-0 seedlings were largest and the 1-2 transplants smallest (table 1). Average survival was highest for the 1-1 planting and lowest for the 1-0 planting.

An analysis of variance showed that only the diameter difference between the 1-0 and 1-2 stock was statistically significant (at the 95-percent level). An abnormal amount of flooding in the spring of 1964 reduced survival on one block of the 1963 planting to 25 percent. This block was treated as a missing observation in the analysis.

Survival remained essentially unchanged since 1966.

TABLE 1.—*Survival, height, and diameter after 1969 growing season*

Planting stock Age	Planted	Survival	Height	D.b.h.
	Year	*Percent*	*Feet*	*Inches*
1-0	1963	63	46.0	7.1
1-1	1964	87	44.5	6.6
1-2	1965	74	41.5	5.7

Also, the differences in height and diameter are not changing. The 1-1 and 1-2 stock grew slower in the temporary nursery than the 1-0 stock grew in the field, but stock of all three ages are presently growing at the same rate in the field.

Any benefits in increased survival of the older transplants would have to offset the growth loss and the added costs of transplanting and planting larger stock. The results of this study show that the advantages of 1-1 and 1-2 stock over 1-0 stock do not justify the added costs on areas not normally flooded. The older stock is of little value for the conditions encountered in the test area.