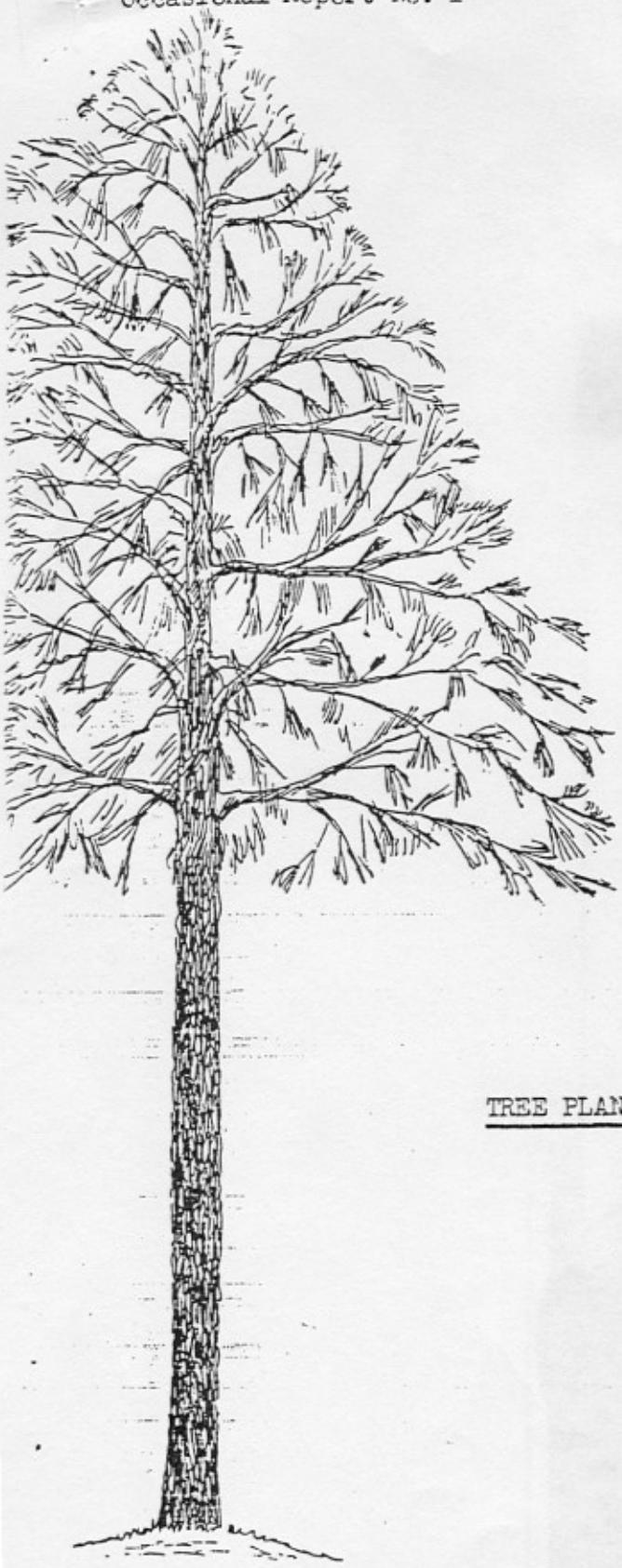
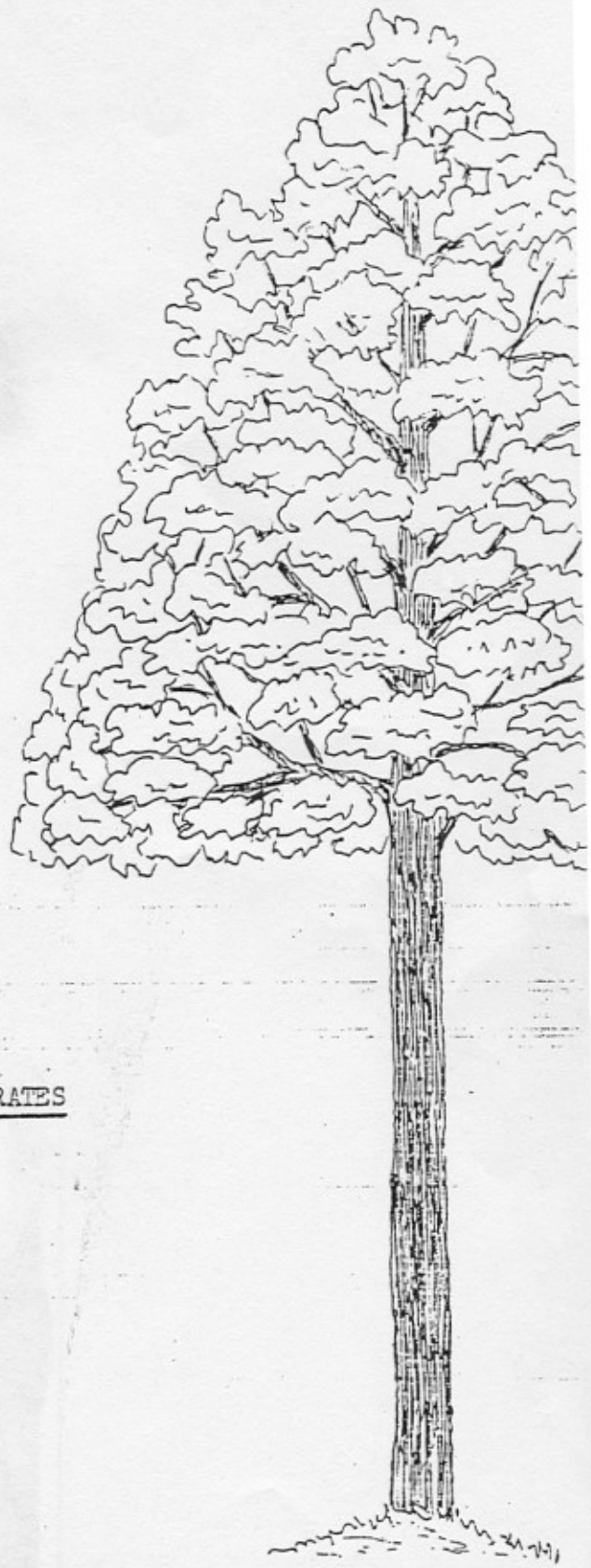
Occasional Report No. 4

September 1956





TREE PLANTING PRODUCTION RATES IN VIRGINIA

KEEP VIRGINIA GREEN

PREVENT FOREST FIRES

DIVISION OF FORESTRY

DEPARTMENT OF CONSERVATION AND DEVELOPMENT

TREE PLANTING PRODUCTION RATES IN VIRGINIA

Landowners interested in planting tree seedlings usually ask how much it costs to plant them. In order to gain more information on the subject, the Virginia Division of Forestry collected data from over 300 different planting jobs within the State. Most of the data was collected from tree seedlings planted during the 1955-1956 planting season. The Division soon discovered that there was a wide variance in planting costs due to the efficiency of the planters, method of planting, the planting site itself, and the cost of labor, just to name a few factors involved. Therefore, rather than try to place a dollar cost on what it cost to plant, for example, 1,000 tree seedlings, it was decided to sift through the data gathered and arrive at an average man-hour planting production rate under different planting conditions. This planting production rate is based on averages and is expressed as the number of man-hours required to plant 1,000 tree seedlings. Such planting production figures should make it unnecessary to gather tree planting cost figures every year. A summary of man-hour planting production rates as found in Virginia during past planting seasons and based on a total of 295 individual planting cases may be found in Table 1, which follows later in the report. The practical application of this table is simple. For example, a landowner in the Piedmont intends to hand-plant 2,000 loblolly pine seedlings on two acres of old field (open). Since it takes, on the average, 10.7 man-hours in the Piedmont to plant 1,000 pines, by multiplying 2 times 10.7 he finds that approximately 21½ man-hours will be needed to plant his trees. His hired labor costs him 85¢ an hour; therefore, he estimates his tree planting costs for the two acres will be 21½ man-hours multiplied by 85¢ per hour, or approximately $18.00 in round figures. To this planting cost the cost of the tree seedlings must be added if total tree planting costs are to be estimated. Loblolly pine seedlings will cost

him $4.50 per thousand, or $9.00 for 2,000. Therefore, he can estimate that his total tree planting cost for the two acres will be roughly $18.00 (cost of planting) plus $9.00 (cost of trees), or $27.00.

The size of the planting job or number of seedlings planted per case or job varied widely. Some individual plantings exceed 100,000 seedlings, while there were many cases in which only 1,000 or 2,000 seedlings were planted. In the Piedmont Open Field Planting (hand) category alone some 43 separate cases planted 2,000 or less seedlings. There was not any appreciable increase or decrease noted in the length of time needed to plant 1,000 seedlings in these smaller planting jobs.

It will be noted that planting production rates for the Piedmont (both open field and cut-over) are similar. It would appear to be more reasonable for the open field planting production rate to be higher than the cut-over production rate. Such was not the case, however. This may be explained in part and due perhaps to closer spacing used on cut-over land, or the soil conditions may be more favorable for planting in cut-over than on open fields in the Piedmont.

Quite a variety of tools were used in hand-planting tree seedlings. The planting bar was perhaps the most commonly used tool, with the mattock being the next favorite. Other tools used, to name a few, included one-half a post-hole digger, shovels, and assorted home-made tools.

Persons doing the tree planting represented practically all walks of life, with farmers and farm help and sawmill crews providing the bulk of the labor. Many landowners did their own planting with good results and in one case the planting became a family affair with mother and father and children all planting trees.

Table 1. Summary of Tree Planting Production Rates for Hand-Planting in Virginia

Physiographic Province	Planting Site	No. Cases	Total No. Trees Planted	Avg. No. Trees Planted per Case	Avg. No. Trees Planted Per Acre	No. Trees Planted per Man-Hour	No. Hours Required to Plant 1 M Trees
Coastal Plain	Open Field	22	393,500	17,800	962	104	9.6
	Cut-Over	36	327,500	9,100	580	82	12.2
Piedmont	Open Field	87	409,700	4,700	952	93	10.7
	Cut-Over	80	519,900	6,500	785	93	10.7
Mountain	Open Field	34	149,900	4,400	1,035	71	14.1
	Cut-Over	22	61,100	2,700	764	62	16.1
Totals		281	1,861,600				
* Coastal Plain & Piedmont	Disked or bull-dozed	14	172,700	12,300	869	104	9.7

Table 2. Summary of Tree Planting Production Rates for Machine Planting in Virginia

Physiographic Province	Planting Site	No. Cases	Total No. Trees Planted	Avg. No. Trees Planted per Case	Avg. No. Trees Planted Per Acre	No. Trees Planted per Mach.-Hour	No. Mach. Hours to Plant 1 M Trees
* Coastal Plain, Piedmont and Mountain	Open Field	32	464,500	14,500	1,013	960	1.0

* Data combined due to similarity.

Planting sites varied considerably as could be expected. More tree seedlings were planted on cut-over timberland this past year than any other year. It is expected that this practice will become more common as time goes on. Some 14 cases involving preparing the planting site by bulldozing or discing the area prior to being planted are also included. The purpose of this dozing or discing was to remove low-value hardwood tree growth or other objectionable ground cover so that trees could be planted on the area. This practice of planting site preparation is also increasing in Virginia.

Machine planting is summarized separately in Table 2. The figures as found in the table are based on 32 different machine planting jobs, and since the production rates were similar in the Coastal Plain, Piedmont and Mountains, it was possible to combine the figures obtained. Therefore, machine-hour planting production rates as found in Table 2 represent combined averages from all the physiographic provinces. It should be noted that production rates here are based on the number of machine-hours necessary to plant 1,000 seedlings and that tractor cost plus at least two men's (one to drive the tractor and one to operate the tree planter) time must also be figured upon. Tree seedling and planting machine rental costs must also be considered in estimating total cost.

R. L. Marler, Forester
Virginia Division of Forestry

September 27, 1956