

# *Time Schedule*

## *Of Virginia Pine Plantations*

### *Advanced*

R. P. Belanger, D. L. Bramlett, and E. L. Moyer<sup>1</sup>

*New techniques for handling Virginia pine seeds and seedlings advance conventional schedules for plantation establishment and cone production by 1 year.*

large test plantations are involved, however, intensive cultural treatments are not always possible. The following procedures were developed with Virginia pine (*Pinus virginiana* Mill.) to advance schedules for planting, growth, and cone production under normal field conditions.

#### Procedures and Results

The time normally required to establish and evaluate study plantations of pine can be reduced by refinements in nursery, planting, and cultural techniques. Squillace and Gansel (1968), for example, were able to assess the potential oleoresin yields of slash pine progenies at 2 1/2 years from seed. Seeds were sown in peat pots, outplanted shortly after germination, then irrigated, fertilized, and cultivated to stimulate rapid growth. When

<sup>1</sup> Associate plant physiologist, plant physiologist, and research technician, respectively, USDA Forest Service, South eastern Forest Experiment Station, Athens and Macon, Ga., and Olustee, Fla. When this research was conducted, the authors were stationed at Blacksburg, Va.

house conditions (16-hour day lengths,<sup>2</sup> 78-80° F., and daily watering) was 76 percent after 35 days.

Seedlings were grown in the greenhouse from December 1969 to late April 1970. Liquid fertilizer was applied monthly from December through March. Equivalent per-acre rates totaled 80 pounds of elemental N, 40 pounds of P<sub>2</sub>O<sub>5</sub>, and 40 pounds of K<sub>2</sub>O. Seedling survival at outplanting was 98 percent. Tops and roots were growing vigorously when the potted seedlings were lifted in April.

We outplanted 1,375 study seedlings in a cleared and disked field from April 28 through May 19, 1970. Cover prior to clearing was primarily mature Virginia and shortleaf (*Pinus echinata* Mill.) pines. Planting was done with a special tool designed to remove a soil "plug" a little wider and deeper than the peat pot. The potted seedlings were placed in the holes and covered with soil up to the root collars. Seedling height aver

<sup>2</sup> Light-hours were from 6:00 a.m. to 10:00 p.m. Incandescent bulbs were used for supplemental lighting.

aged 0.26 feet. New top growth was first noticed on July 6. By the end of the growing season, average height was 0.54 feet. Survival was 99 percent.

Seedlings were examined for flower production at the beginning of the second growing season. The plantation at this time was only 18 months from seed. Forty-three seedlings had one or more female flowers (megasporangiate strobili). Flowers were found on some seedlings from all families. One seed

ling produced pollen cones (microsporangiate strobili) -unusual for such a young seedling.

The outplanting site was fertilized and mowed once during the second growing season. Weather conditions were excellent for tree growth. Total height after the second growing season averaged 1.81 feet.

We compared these results with those of seedlings planted with conventional methods in the same field during the spring of 1965 (table 1).

The greenhouse-field techniques eliminated the nursery phase of growing seedlings. Schedules for outplanting, height growth, and cone production were advanced by 1 year. Seedling survival has been excellent. The method described results in a saving in time and an increase in efficiency.

#### Literature Cited

Squillace, A. E., and Charles R. Gansel. 1968. Assessing the potential oleoresin yields of slash pine progenies at juvenile ages. Southeast. For. Exp. Stn., USDA For. Serv. Res. Note SE-95, 4 pp.

TABLE 1.—*Growth and cone production of Virginia pine seedlings raised under*

Schedule	Age from seed collection Months	Mean height Feet	Schedule
Greenhouse—Field Techniques (2 Years)			Conventional Planting
Fall 1969: Seed collection	0	—	Fall 1963: Seed collection
Winter 1969-1970: Greenhouse	1-6	—	Spring 1964-1965: Nursery
Spring 1970: Outplant	6	0.26	Spring 1965: Outplant
Fall 1970	12	0.54	Fall 1965
Spring 1971: Female flowers observed	18	—	Spring 1966: Female flowers observed
Fall 1971	24	1.81	Fall 1966

