

ROOTING OF PITCH PINE STUMP SPROUTS¹

Frank S. Santamour, Jr., Geneticist
Northeastern Forest Experiment Station ²
Upper Darby, Pa.

The importance of using clonal stock of pines in physiological and genetics studies is widely recognized. In genetic research the clonal material could be used in seed orchards, and the genetic uniformity of the clone would increase the efficiency of evaluations in flowerinduction studies, fertilizer treatments, or other environmental manipulations. A preliminary study of rooting pitch pine (*Pinus ritvida* Mill.) was undertaken to determine the possibilities for producing clonal material from trees that are several decades old.

Methods and Results

Sprouts from a single tree of pitch pine were used in the rooting tests. The tree was growing along a dirt road on the Beltsville Experimental Forest, Laurel, Md., until it was cut by a maintenance crew late in the spring of 1961. It was 29 years old and its outside bark 6 inches above ground level was 5 inches in diameter. When first examined in September 1961, the stump had produced 108 sprouts 4 to 12 inches in length.

¹The research reported here was conducted by the Northeastern Forest Experiment Station in cooperation with the Morris Arboretum, University of Pennsylvania, Philadelphia.

² **Now** a geneticist at the Morris Arboretum.

The first batch of cuttings was collected on September 29, 1961, when the sprouts were still extremely succulent. Of the 45 terminal cuttings 4 to 6 inches long, 35 were treated with a growth-promoting substance, and 10 were used as a control. Treatment consisted of splitting the base of the cutting about 1 inch and dipping the base in Hormodin No. 3. All cuttings were inserted about 2 inches deep in a peat moss-vermiculite rooting medium under an intermittent mist system in the Morris Arboretum greenhouse in Philadelphia. By January 31, 1962, 23 of the treated cuttings (66 percent) had produced roots, but none of the untreated cuttings had rooted. On this date the rooted plants were potted, and the remainder were discarded. No mortality occurred among the rooted cuttings, even after potting and transfer to a cold frame in August 1963.

A second collection of cuttings was taken from the same stump on January 25, 1962, after the sprouts had hardened off and assumed a more woody character. Forty-two cuttings were treated as before, and 10 cuttings were used as a control. Considerable mortality occurred in this batch of cuttings, and no rooting had occurred by April 16, 1962, when all cuttings were discarded.

Discussion

The rooting of pitch pine stump sprouts appears to be a promising method of propagating from older trees of this species. Cuttings taken while the sprouts were still succulent proved best in the limited experiments described here. Rooting percentages even higher than the 66 percent obtained in the test might be achieved by a more critical selection of cutting material. Treatment with Hormodin No. 3 has given sufficient rooting to make this method of propagation adaptable to various research objectives.

If pitch pine becomes the subject of intensive tree-improvement research, this technique would be of special significance because selected plus trees are likely to be more than 50 years of age. The rooting ability of pine

cuttings decreased markedly with increase in age of the parent tree. In certain species rootability may drop to zero in trees older than 15 to 30 years.

However, pitch pine trees up to 95 years of age may produce stump sprouts³ and hence may be propagated from this material. One-year-old stump sprouts produce only primary leaves, and the success achieved in rooting such sprouts may be a result of their young age. When the parent tree is cut, the stem can be used for analyses of wood quality or other characteristics and, if desired, the genotype may be maintained in situ by allowing one or more vigorous sprouts to remain on the stump.

³ Andresen, John W. 1959. A study of pseudonanism in Pinus rigida Mill. Ecol. Monog. 29: 309-332.