

## NEW JERSEYS TREE IMPROVEMENT PROGRAM

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The need for a reliable supply of high quality seed has prompted New Jersey to initiate a tree improvement program to insure such a supply, Present efforts are concentrated on the main species grown at the Washington Crossing Nursery. In addition, New Jersey is actively aiding surrounding states by locating outstanding individuals growing in New Jersey and sharing seed and scion wood for use in tree improvement programs in neighboring states.

### SEED ORCHARDS AT WASHINGTON CROSSING

#### Japanese Larch Seedling Seed Orchard

In the spring of 1963, 500 two-year old selected seedlings (outstanding in the seedbed) were planted at 8 x 8 feet spacing in deep., well-drained nursery soil. A permanent sod cover on the area stabilizes and enriches the soil. Several mowings each year provide mulching material and reduce competition for moisture and nutrients. An area of approximately eight square feet around each plant is kept free of competing vegetation with periodic applications of mineral spirits. These seedlings are irrigated regularly during the growing season with an additional inch or two of water per month, A complete fertilization program is being applied. Failures have been replaced with similar seedlings held in reserve.

Since these seedlings continue to vary in their expression of desirable characteristics such as rapid growth rate and a straight stem, the State will maintain them as a short-term growth trial until seed production begins. At that time the undesirable individuals will be rogued out.

An acre of clonal Japanese larch material for seed production is planned for grafting in the spring of 1965. This material will include 25 outstanding phenotypes from our Northeastern area.

#### Austrian Pine Seedling Seed Orchard

About 450 selected seedlings of Austrian Pine (representative of the best individuals in the 1961 seedbed) were also planted in the spring of 1963. This orchard has received the same cultural treatments as the larch seed orchard. The seedlings were planted at 8 x 8 feet spacing, irrigated,, fertilized and kept weed-free. Although the pine demonstrated better initial survival than the larch, its subsequent growth has been less than satisfactory, Should this French highland seed source continue to lack the desired form and vigor, the area will likely be converted to a clonal seed orchard. Such a clonal orchard is currently planned to collect the best Pinus nigra, P. nigra var. calabrica and P. nigra var. cebennensis individuals growing in the coastal areas of Connecticut, New York and New Jersey.

There is also a promising experimental plantation of pine hybrids at the Washington Crossing Nursery<sup>2</sup>; these will be evaluated by the Northeastern Forest Experiment Station.

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<sup>2</sup>Hybrids produced and outplanted by the Genetics Project of the U. S. Forest Service., Northeastern Forest Experiment Station,

### Norway Spruce Seed Production Area on the Worthington Tract

This area was primarily marked for seed production, Since the stand is next to a recreation area, it represents a site for possible expansion for picnic grounds. This picnic use will not be concentrated in the main seed production area; the public will not have easy access through the stand. To reduce foot traffic, stems and snags are to be piled between the road and picnic tables. Easy access for cone collecting is not a major consideration and squirrels should find these piles attractive for caching cones. With a few exceptions, the individuals with small crowns (tending to whip) are marked for removal. This marking represents a moderately light thinning from below. A heavy thinning might increase the risk of wind damage in the stand, The trees marked are usually competing with the better seed trees. Occasionally the trees to be removed exhibit undesirable traits, such as multiple leaders or heavy spruce canker infestations Only a few of the trees to be rogued are currently producing cones.

Except for the large unsaleable material left to discourage foot traffic, the small, brushy slash should be reduced to chips to lessen the fire hazard. All live stumps are to be treated with borate powder immediately following cutting to reduce the possibility of Fomes annosus infection. Soil samples from the plowed layer have been taken for nutrient analysis as a basis for fertilization recommendations.

In five to seven years it would be desirable to repeat this roguing on a more discriminating basis. Some additional stimulation of the seed trees can be anticipated concomitant with the removal of the undesirable individuals.

### Norway Spruce Clonal Orchard

A program for grafting 30 Norway spruce clones is scheduled to begin in the spring of 1965. Several outstanding New Jersey trees have been selected for propagation. The remaining individuals will be gathered in the Northeast with the cooperation of neighboring states.

### Other Programs

As the need for hard pine seed increases, seed production areas will be established for both shortleaf and Austrian pines. Several fine plantations on the Wharton Tract are well managed. These stands have wide-spaced, large-crowned seed trees producing numerous cones. During seed years collection efforts should yield sufficient seed for nursery needs.

No report of tree improvement in New Jersey would be complete without a word about the important program now underway at New Lisbon, N. J. as a cooperative project involving the Northeastern Forest Experiment Station and the West Virginia Pulp and Paper Company, This project calls for a hybrid breeding orchard to combine the growth rate and fine form of loblolly pine with the hardy pitch pine. Pitch pine growing in much of the Northeast often demonstrates poor form. A number of states and individuals have expressed great interest in this project since these orchards can potentially yield superior pitch and loblolly seed in addition to hybrid material. This project's tests should be of great value in both research and practical phases leading to an economic enlargement of the Northeastern hard pine range.