NATIONAL FORESTS: RECENT TREE IMPROVEMENT DEVELOPMENTS

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This paper discusses the current status of a number of projects now under way on the National Forests in the Eastern Region of the USDA Forest Service.

Selection of Superior Trees

Initial selections are complete for one 50-clone orchard and nearly complete for a second orchard of white spruce. We are actively searching for superior tree candidates in black spruce, jack pine and red pine in the conifers, and in yellow birch, sugar maple and red oak among the hardwoods.

This year we revised our record form so that all of our superior tree records are now processed by ADP. We now have records on over 1,500 selections in all species. Keeping track of changes, records of grafting, etc., was becoming a big chore. This new system can be kept current with a minimum of effort:

Grafting

We had another busy year with our grafting program in white and black spruce and eastern white pine. We do all our grafting in greenhouses at the Toumey and Eveleth nurseries. This year we completed over 9,000 grafts with very high success. Our "take" on white pine has averaged 99 percent for the past 3 years. The spruces, while somewhat lower at 85 to 95 percent "take," are much higher than those reported in the literature. No small part of this success is due to the skill of the nursery crews and the nurseryman.

Oconto River Seed Orchard

Perhaps our biggest news item is the purchase of some farm land near Langlade within the Nicolet National Forest (Wisconsin) . Nearly 500 acres of this tract has been under cultivation. We plan to develop most of our seed orchards within this area, making it one of the largest seed orchard developments in the U.S. Topographic work has been completed on the open areas. Soil analysis shows excellent structure. A contract has been awarded for a deer exclosure fence. We plan to establish two seed orchards and a large clonal breeding arboretum here in 1969.

Our seed orchards are computer-designed by the University of Wisconsin, using a program built by Dr. G. Stairs. This program randomizes the placement of ramets on a hexagonal pattern but with conditions. It maximizes the crossing pattern between clones and equalizes the number of times each clone appears in the orchard. We're using this same program with an 85-acre seed orchard for Missouri shortleaf pine.

Rust-Resistant White Pine Program

Selection of Candidates

The selection data are now complete for all cooperators except the State of Michigan and the University of Wisconsin. As of this writing, 946 selections have been reported, 921 have been screened, 686 have been accepted, and 25 selections remain to be checked.

Grafting

The cooperation we received in the scion collection work was again excellent this year. We collected scions from 219 selections, completing the grafting phase of the program for all cooperators except the State of Michigan and the University of Wisconsin. The few remaining trees will be grafted next year.

Seed Orchard

This spring all of the white pine grafts made during 1966 and 1967 will be outplanted in the Oconto River Seed Orchard. Five grafts from each accepted candidate will be planted in a clonal breeding arboretum where they will receive intensive care to help stimulate flowering. When the grafts begin to flower, we will start a controlled pollination program to produce seed for testing. This will supplement the field pollinations already in progress.

We also intend to plant an interim seed orchard consisting of 29 clones that we received from Dr. C. Heimburger in Canada, and five clones from Dr. R. Patton of the University of Wisconsin. These clones have all been tested for resistance to blister rust. The seed produced in this orchard will be tested to determine the clones that transmit the rust-resistance to their offspring.

Hybridization

Many of the scions grafted this winter produced conelets, suggesting that there will be a good cone crop for our pollination work this spring. We hope to repeat the crosses that did not produce the required amount of seed the first time, and begin pollination work on as many new selections as possible.

Additional work is being carried out in the development of black cherry on the Allegheny and Monongahela National Forests. We are also cooperating with Region 8 in the development of shortleaf pine.