# RECENT PROGRESS IN FOREST GENETICS WORK AT THE LAKE STATES FOREST EXPERIMENT STATION

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A little over 2 years ago, at the first Lake States Forest Genetics Conference, we reported the forest tree improvement work done by the Lake States Station up to that time. Since then the Station has carried forward the studies established in the past and has broadened its activities to include new lines of tree improvement research.

## WORK SINCE 1953 AND FUTURE PLANS

The most significant development for the Station since the last conference was the establishment of a full-time forest genetics program on July 1, 1954. This was an outgrowth of the same expanding interest in forest tree improvement that led to the formation of our Forest Tree Improvement Committee and similar groups in other regions.

Our program basically has two main points of emphasis: (1) project work by Station staff members, and (2) cooperative work with other agencies. In both of these we recognize the need for tree improvement research on all important forest tree species within the region. At the outset, however, we plan to channel our major effort toward the development of improved spruces for the Lake States. Other species will be considered in the Station's plans for the future,

Progress has been made along several lines: (1) We now have two full-time technical men, a silviculturist and a geneticist, engaged in forest tree improvement research, Paul Rudolf has been assigned to genetics work full time and has been relieved of other Station responsibilities. Dr. Nienstaedt, our geneticist, will be working with Mr. Rudolf. (2) After a thorough survey of the region we have selected a site for a forest genetics field center adjacent to the Hugo Sauer Nursery near Rhinelander, Wisconsin, and at this time have under way the construction of a greenhouse, laboratory, and office facilities there, (3) We have begun studies on vegetative propagation of white spruce. (4) We are assembling seed for a comprehensive study of variation within white spruce and black spruce. (5) We have equipped a forest genetics – soils laboratory at St. Paul, (6) We have entered into one cooperative-aid project with the University of Wisconsin and have other aid projects under consideration, (7) We are cooperating with the Institute of Paper Chemistry in the disease phases of their aspen genetics work. (8) Current work on studies previously under way consists chiefly of re-examining seed source studies and tests of hybrids.

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## Seed Source Studies

Work has been pushed in red pine, jack pine, and the spruces.

### Red pine

New, and as yet unpublished, information has been obtained on the growth and development of 50 and 150 sources of red pine, respectively 14 and 17 years after planting. Reports on the results will be prepared,

Nursery-bed observations on more than 160 lots of second-year red pine seedlings indicated a general relationship between time of flushing and length of growing season of the place of origin.

### Jack pine

In the spring of 1954 about 75,000 2-0 jack pine trees of more than 30 seed sources were lifted, counted, packed, and distributed to 11 planting sites in Wisconsin and Michigan by the Station with the cooperation of the Wisconsin Conservation Department. At the same time the University of Minnesota similarly handled about 53,000 trees which were distributed to 8 planting sites in Minnesota and western Wisconsin, In cooperation with the Station and the University of Minnesota, the University of Michigan, Michigan Conservation Department, Minnesota Conservation Department, Nekoosa-Edwards Paper Co., Mosinee Pulp and Paper Co., 4 national forests, and 2 Wisconsin Counties, Burnett and Marinette, set out 128,000 trees in 17 plantations (2 plantations were supplied stock from both the Minnesota and Wisconsin nurseries), each containing 4 replications of the 30 seed sources.

First-year survival averaged about 90 percent, so some 13,000 2-0 seedlings of the same origins were set out in the spring of 1955 to replant fail spots. The same cooperators participated in the examination and replanting of these plantations.

### Spruces

A recently completed report describes the survival, growth, and development near Eagle River, Wisconsin, of 7 sources of white spruce, 6 sources of Norway spruce, 2 sources of red spruce, and 1 source each of the following spruces: black, oriental, Sakhalin, Serbian, and Siberian. Two sources of white spruce and three sources of Norway spruce appear best 16 years after planting. Black and Siberian spruces have done reasonably well. The spruces originating in a climatic zone notably milder than that of the planting site have done poorly.

## Tests of Hybrids

Small lots of jack pine - lodgepole pine hybrids and eastern white pine - western white pine hybrids and their parent species have been field-planted on experimental areas in northern Minnesota, northern Wisconsin, and the Lower Peninsula of Michigan. The stock was grown by the Station in the Hugo Sauer State Nursery in Wisconsin from seed supplied by the Institute of Forest Genetics in California. So far, the native Lake States species are distinctly superior to the hybrids or the western parent species.

In a small planting of hybrid aspens supplied by the Cabot Foundation one cross between quaking aspen and European aspen at 4 years of age has grown and survived better in northeastern Wisconsin than the local native aspen or a cross between eastern and western forms of quaking aspen.

## Cooperative Collections

For a number of years the Station has cooperated with persons and agencies in the United States and in foreign countries by supplying them seeds, pollen, and other plant materials for tree improvement purposes. We expect to continue such activities as a part of our tree improvement program and to receive similar material in return.

## THE LAKE STATES FOREST TREE IMPROVEMENT COMMITTEE

Our Station has been glad to contribute to the work of the Forest Tree Improvement Committee by making available part time of one staff member to serve as chairman, by giving him necessary clerical help, and by publishing the proceedings of the first conference. The work of this committee in stimulating and coordinating forest tree improvement activities in the region is of high importance, and we will continue to do what we can to further the committee's work. We feel there is a need for greater emphasis on coordination in new programs between the various research groups in the field of genetics and believe the Lake States Tree Improvement Committee can be an effective tool in this respect.

## CONCLUSION

in the few minutes allotted I have been able to give you only a very sketchy outline of the recent work and plans for future work at our Station. I hope that it has conveyed to you the general scope of our current activities.