

REPORT OF TECHNICAL COMMITTEE III.
SELECTION OF TREE RACES FOR THE NORTHEAST

The purpose of the assignment of this Committee according to the outline appearing in the first issue of NEFTIC NEWS, March 24, 1954, was three-fold:

1. Develop a working plan for the evaluation of Northeastern plantations of known origin. This should include both exotic and native species.
2. Prepare an estimate of the cost (in technical time and cash expenditures) of such an evaluation handled as a cooperative project.
3. Investigate the possibilities for obtaining the cooperation to carry out the evaluation in accordance with the working plan.

The report of the Committee at this time falls far short of attaining these objectives. Actually, the Chairman of this Committee has succeeded only in obtaining such information as was available from the other two members of his Committee: H. I. Baldwin of New Hampshire, and J. E. Ibberson of Pennsylvania, and from this information, together with what was available in New York, to set up an outline of what is going on in this field and how these projects might be followed in the immediate future. I may say, also, that there was not enough time to submit advance copies of the text of this Committee report to the other two Committee members, so that your Chairman will have to take the sole responsibility for the report.

A better name for this Committee would probably be "Selection of Tree Species and Races for Conifer Plantations in the Northeast", since it is

obvious that the Committee will concern itself only with plantations.

Of the conifer species planted in the Northeast during the past four or five decades, it has become apparent that certain of the exotics (by "exotics" we mean to include western North American species as well as those from other countries), have exhibited the greatest amount of racial variation and, in some, the greatest adaptability for selection and crossbreeding. These exotics are chiefly Scotch pine, European larch, Norway spruce, and Douglas fir. Scotch pine and European larch had, of course, a vast background of study and experimental work in Europe, while considerable work has been done in western North America on Douglas fir. In the case of Norway spruce, there had been less study and on the whole, less exhibition, of clearly defined races, though it was still ahead of the native North American spruces in these respects. The pioneer work on larch here in the Northeast, was done by S. S. Hunt through his studies at Harvard Forest, supplemented by observations on plantations in New York while employed by the New York State Conservation Department. Many of our present concepts of larch stem directly from Hunt's work. Experimentation with so-called Dunkeld hybrid larch was of somewhat later development and was initiated by the writer and E. J. Eliason as a result of receiving a small shipment of seed collected from the parent trees on the Atholl estate in Scotland. Later on, the Department went into mass production of this hybrid from seed collected from second or third generation plantations in Scotland, and a considerable number of plots are available for observation, both on State Forest lands and on lands of private individuals to whom this stock was distributed. At the same time; a careful record was kept of the seed origin of various shipments of larch seed used for propagation, and the location of these is rather well known today. There does not seem to have been a great deal of intensive work done on larch outside of New York except by Baldwin in New Hampshire.

New York, likewise, has probably done the-major portion of intensive experiments with Scotch pine, mainly because the other states tended to give it up as a bad job after seeing some of the crooked plantation which had developed from this species. Since Scotch pine became important as a Christmas tree about 20 years ago, however, a considerable amount of empirical selection has been done by commercial Christmas tree growers, particularly in Pennsylvania. Most of the emphasis in New York in recent years has also been with respect to obtaining races suitable for Christmas trees rather-than for timber purposes.

Norway spruce did not have a great deal of experimental work done in this country up to the time that seed of known origin was made available by the International Union of Forest Research Organizations in the latter 30's and 40's. Some of the plantations from these seed stocks are now well enough established to allow for the taking of observations and the drawing of conclusions.

Douglas fir has had a somewhat checkered career in the Northeast. Early plantings of West Coast strains were promptly liquidated by the eastern winters and since then, practically all of the plantings have originated from Rocky Mountain seed. More recently, there has been some interest in the interior British Columbia Douglas fir which seems to be recognized as a distinct race. We already have had some success with this in New York, and Pennsylvania State College has a rather intensive set of tests under way in which various Rocky Mountain, British Columbia, and West Coast races are included. An

attempt is being made here to correlate the reaction of the various Douglas fir races to the climatic zones of Pennsylvania. Since these plantations were only set out in 1952, it will be some time before results will become available. In the meantime, Douglas fir plantations have had rather hard going in New England as a result of Phomopsis canker and Adelopus leaf cast, so that it seems unlikely that further attempts will be made to grow Douglas fir in those states. In New York thus far, Douglas fir plantings have been relatively free from Adelopus, but have recently shown signs of infection by another leaf cast, Rhabdocline pseudotsuga, and the Conservation Department is currently collaborating with the State College of Forestry at Syracuse, in tracing the development of this infection, with particular reference to any difference in susceptibility of the various geographic races.

Of the native species, only white pine and red pine have received much attention. In the case of white pine, the principal incentive has been to find species or types resistant to blister rust and/or the white pine weevil. In this connection, some of the exotic white pines such as the five-needled - white pines from western United States and Pinus peuce from Europe have been included.

Work has been done on red pine, both in the Northeast, in Canada, and in the United States, and already one or two fairly distinct racial types can be recognized. In connection with native species, it should be mentioned that Pennsylvania has some intensive experiments going on with shortleaf pine in cooperation with the U. S. Forest Service. The results of these experiments will, of course, not be applicable to the northern part of the region.

In addition to experimental planting, another development in tree improvement has been the so-called seed orchard. Pennsylvania has an elaborate program along this line, and we are beginning to get into this in New York.

Among the industrial plantations where experimental work has been done, one of the most interesting is a tract maintained by S. D. Warren Company near Bingham, Maine, which includes white, Norway, and Scotch pine, white Norway, and red spruce, and European larch. We understand that this company has maintained excellent records on these plantations, including the seed sources, and these and other similar plantations by private agencies should certainly be taken into consideration by this group.

Our Committee has been asked, as you will note under item 1 above, to develop a working plan for evaluation of Northeastern plantations of known origin. This is something which is going to take a considerable amount of deliberation, and a few of the factors may well be discussed at this time:

a) The principal difficulty in following up these plantations is the fact that they are so scattered, with the exception of those which are located on a college experimental tract, and often these are too limited in size and site variations to really fill the bill. These have the advantage, however, of being available to graduate students or other investigators who do not have travel facilities. To maintain observations on these scattered and sometimes remote plantations, requires some sort of research organizations which have continuity of policy and availability of funds. Both of these have been conspicuously lacking in much of the work in the Northeast. Much of the observational work on these plantations could be carried on by qualified graduate students or "cub" foresters who could be assigned to the job under supervision.

Graduate students would frequently be willing to undertake this sort of work without pay, but there does not seem to be any way to get them on an expense account and since they are customarily without personal funds, they are, therefore, immobile and their work has to be limited. to experimental tracts where they can settle down and do all their work in one place. If it were possible to secure an allocation merely of travel funds from private sources, I believe the state forestry departments and the colleges working together would undertake the organization and supervision of such projects. I am frank to say that we have not attempted to arrive at any evaluation of such costs and would not be able to do so, without making a detailed enumeration of where all these plantations are located.

b) Another matter with which NEFTIC should concern itself is setting up some uniformity of observational methods. if everybody just goes out and makes observations according to his own ideas or the whim of the moment, there will not be very much opportunity for comparing plots in different parts of the region. I have just had from Baldwin an outline prepared by the International Union of Forest Research Organizations in which specifications for plantation layout and observations are set forth in a great deal of detail. While it probably would over-burden the proceedings of this meeting to include this material, I believe it should be distributed to those who may participate in this type of experiment, and will be glad to undertake this as Committee Chairman. We can't do anything about layout, of course, the plantations have been set out and will have to go along as best we can, making allowances for such defects in layout as will inevitably occur from one place to another.

c) An appraisal of this project requires some sort of age-class grouping of the plantations. In the first group, which we will designate "A", the plantations may be from 15 years upward; and already overdue for observations or treatment; in a, second. group, "B", they will be from 5 to 20 years of age; and at a stage where they can be examined most effectively; the third group, "C", are plantings less than 5 years old., which will not be ready for examination for another five years or so.

Some of the results from experimental planting will be of academic interest only, merely adding to our general store of knowledge about the different species. In other cases, as in selection for desirable types of Christmas trees, the results may be immediate and very practical. It is also true that a. genus such as Larix, which combines extreme rapidity of growth with ability to hybridize readily and whose separate species exhibit well-defined geographic races, lends itself exceptionally well to experimentation. Such experiments may produce rather dramatic results in a relatively short period of time. Other less plastic species may require more time, greater patience, and considerably more drudgery before anything is found out.

Certainly, before private industry is asked to contribute toward such projects, they should know what they are buying.

A great deal can be accomplished by the type of inter-agency collaboration which has been stimulated during the past year by NEFTIC. If we can get geneticists, silviculturists, and parasitologists more likely to get our money's worth out of these experiments than with everybody working on his own.

E. W. Littlefield, Chairman
H. I. Baldwin
J. E. Ibberson