PENNSYLVANIA TREE IMPROVEMENT PROGRAM
PROGRESS REPORT 1963-64

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SITUATION

In general, the tree seed situation in the State of Pennsylvania is similar to that in many other northeastern states, that is, the nurseries are at the mercy of the seed merchants in regard to purchasing seed of known source and quality. Quality specifications are given in percent germination and state of origin. The latter of course can not be insured or checked. Pennsylvania is in the tree improvement business to insure the "quality" of future seed our nurseries use to grow seedlings.

Through the establishment of seed production areas and seed orchards, it is intended to produce seed which will; (1) be of the correct geographic source for use in most areas of the State, (2) be inherently better in regard to characteristics important for species use.

PLAN

The tree improvement program in Pennsylvania will concentrate on six species which now comprise 85 percent of a 15-20 million annual seedling production. They are, in order of importance: white pine, Japanese larch, Norway spruce, Virginia pine, European larch, and pitch pine. Clonal orchards are now planned for the species mentioned.

Ninety acres of orchard area have been cleared and prepared for estimated needs. Area requirements were estimated on the basis of seedling production, number of shippable seedlings per pound of seed, and estimates of seed orchard production per acre. An additional six acres have been prepared for Virginia pine, after some doubt arose about frost damage to this species during the flowering season at the existing sites. Plans for progeny testing of selections are not final, but there is every intention to do so.

PROGRESS

Since the spring of 1962, 70 selections have been grafted, about half of which are from trees in Pennsylvania and the other half in adjoining states - being either original selections or selections used in other state programs. About 1200 grafts have been successful about 1/4 being spring field grafts and the rest being winter greenhouse grafts.

The six acres of established orchard are of white pine and located at one of the two Penn nursery sites. It includes 20 clones, with a staggered 20'x20' spacing. This orchard will be extended to about 11 acres in total The orchard arrangement is a design, balanced to insure maximum cross pollination and near equal frequency of possible combinations under ideal theoretical orchard conditions.

Grafts of the other species are in holding areas. After inventory is taken of this year's grafting, plans will be made for the establishment of other orchard areas. All of the orchard areas, with the exception of the six-acre Virginia pine area, are located next to the two state nurseries at Clearfield and Penn. All are in high risk areas regarding deer damage and are enclosed in eight-foot-high fencing.

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In addition to the seed orchard work, two areas of Norway spruce have received treatment as seed production areas. In the 2.5-acre area at Mt. Alto, additional trees were rogued during 1963, understory vegetation has received killing sprays, and a complete fertilizer applied in an attempt to increase flowering. In the 4.2-acre area at Clearfield, a roguing is in process and other treatments will follow.

PROBLEMS AND OBSERVATIONS

After two years of working with the program, several observations may be of interest to other workers in state programs. Norway spruce grafting, both in the greenhouse and in the field, has been relatively unsuccessful. In two years, average grafting success has been a low 20 percent. Similar results have been reported in New York State's program. The field grafting of larches without bagging in late March in Pennsylvania has been very successful this season, Japanese and European larches have been 90 percent and 70 percent successful respectively. In general, European larch has been relatively more difficult to work with than Japanese larch - from rootstock handling to grafting.

Since most orchard sites do not have the best soils, it may be necessary to plan for additional preparation in the establishment phase. Survival and early vegetative growth of grafts requires a good planting soil and early care. In Pennsylvania we are now using a post-hole digger to drill a hole roughly 16" in diameter and 24" deep which is filled with top soil in preparation for graft transplanting. Survival with this method has been excellent even with small stock and in this, a drought year.