34. FOREST GENETICS RESEARCH AT THE UNIVERSITY OF GEORGIA

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The School of Forestry at the University of Georgia has recently become part of a quadripartite cooperative agreement between the Georgia Forest Research Council, the School of Forestry, the Georgia Forestry Commission, and the Southeastern Forest Experiment Station of the Forest Service, U. S. Department of Agriculture. The agreement is aimed at developing and expanding an adequate forest research program in the state of Georgia. Under this arrangement a genetics program has been initiated.

Total contributions to the genetics program amount to $22,350, of which $8,850 was given by the School, $11,100 by the Georgia Forest Research Council, and $2,400 by the Georgia Forestry Commission.

The work at the School of Forestry has been, is being, and will be coordinated with that of other agencies through the efforts of Mr. Keith Dorman of the Southeastern Forest Experiment Station.

Fully realizing that individual tree selection and seed certification are the most practical and immediate measures necessary in a tree improvement program, our first and introductory project involves tree selection, the collection of seed resulting from open and controlled pollination and of clonal material from selected parent trees, and the establishment of an arboretum or outplanting area. Such an area will be used for the planting of seed and propagated clonal material from selected trees for future breeding and hybridization, genetic studies, progeny tests, and seed sources.

Trees are being selected from various sites in different locations and for specific characteristics. At present our selections are being limited to the four major pines in the region. Future study may involve other species, both gymnospermous and angiospermous. Selections are to be made on the bases of: clear length of stem and tree height, taper of stem, straightness of grain of wood, diameter of branches, angle of branches, diameter of the bole, forking of the stem, straightness of stem, natural pruning ability, apical dominance, narrowness of crown, seed production, flare of butt, sprouting of epicormic buds, wood density, cell size, cell wall thickness and the relative amounts of earlywood and latewood, fiber length, disease resistance and other characters as yet unclassified. At present selections are being made on the bases of form and vigor. Within these selected trees other qualitative factors will be considered.

A second project has been initiated to consider vegetative propagation its morphology, physiology, techniques, and practical application. The objectives of this project are: (1) to seek better techniques; (2) to ascertain the effects of age, type, condition, and source position on vegetative propagation; (3) to investigate the effects of environmental conditions and seasonal relationships on vegetative propagation; (4) to study the morphological and physiological aspects of the union of stock and scion in grafting, callous formation, and root development on cuttings.

A third project, now in the thinking mill, will involve the study of the nature of flowering and cone production from the morphological, physiological, and genetical standpoints, with the view towards finding methods whereby anthesis may be stimulated in younger trees.

Future studies will be made of the mode of inheritance of specific characters supplemented by anatomical and cytogenetical considerations, and of vegetative vigor as it may possibly be correlated with chromosome number. Breeding and hybridization will be undertaken.

Mr. Boyd M. Witherow is sharing in these labors.

Also under the Research and Marketing Act financial support has been provided for a genetics program now under the leadership of Dr. L. W. R. Jackson. He is assisted by Mr. James Greene formerly of the Ida Cason Callaway Foundation Tree improvement program, now a graduate student in the School of Forestry at the University of Georgia.

Their efforts are now directed toward a comparative study of certain anatomical features of slash pine parents and the progeny produced by controlled pollination and open pollination. Such anatomical features as resin ducts, tracheid length, and earlywood and latewood are under consideration. Specific gravity is foremost among the physical properties of wood being examined.