33. TREE IMPROVEMENT ACTIVITIES AT NORTH CAROLINA STATE COLLEGE

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As yet there is no formal program in Forest Genetics at the School of Forestry, North Carolina State College. However, some existing studies and future investigative work are designed to contribute to tree improvement, at least in a small way. Additional research on a more substantial basis is planned for initiation as soon as funds and manpower permit.

Included in the present studies are:

1. A small test of certain selections of loblolly and shortleaf pines from the Southwide Pine Seed Source Study. The stock for this test was grown in the Clayton Nursery in Johnston County, North Carolina, and out-planted on two School Forests,--the Hope Valley Forest in Chatham County and the Hill Demonstration Forest in Durham County. The test is not designed for rigorous assessment of source differences, but should provide bonafide specimens for future breeding and other tree improvement activities.

2. A small test, in cooperation with the Institute of Forest Genetics, Placerville, California, involving mainly hybrids of shortleaf and loblolly pines. Outplantings of this stock on the Hill Forest in Durham County and near the Clayton Nursery in Johnston County are re-examined periodically. Records include height growth, vigor, incidence of tip moth infestation, etc.

3. A test of local seed source of loblolly pine, involving a 10-tree sample of seed from each of three school Forests: the Richland Creek Forest in Wake County, the Hope Valley Forest, and the Hill Demonstration Forest. These forests are located roughly at the apices of an isosceles triangle, with the base equal to -i-0 miles, and the two sides about 30 miles each. The test is in its first year in the field, and no startling differences have become manifest as yet. Seed from all 30 trees were tested in the greenhouse and showed the usual large between tree differences, which were not too clearly associated with source. Of some interest was the observation that one tree consistently suffered heavy damping-off losses in all five replication, heavy losses occurring even when the two adjacent rows (with rows spaced two inches apart) were completely free of loss.

4. A test of longleaf pine from the deep sand area of Bladen County, North Carolina, and from the sandhills region of Chesterfield County in northern South Carolina and from Aiken County on the Georgia border. This project is in cooperation with the North Carolina State Forest Service, the Southeastern Forest Experiment Station, the South Carolina. Forestry Commission, and the Atomic Energy Commission. The seed source or genetic phase of this study is only incidental to the main objective of determining whether certain nursery treatments, coupled with planting site preparation, will improve survival of longleaf pine and stimulate early height growth. It will, however, provide documented plots of known seed source for possible use in future tree improvement work.

Work planned for initiation in the near future includes:

1. A test of white pine seed source to determine whether a "boreal remnant" of about 200 acres in extent of white pine at the confluence of Deep River and Rocky River in Chatham County represents a different strain from that of the main white pine type about 150 miles westward in the Appalachian foothills. A population sample of cuttings, or rather twigs to be used in cuttage and graftage, was sent to Dr. Heimburger in Maple, Ontario, nearly 2 years ago to be used in his studies of disease resistance.

2. A test of gamma ray, X-ray, and neutron radiation of pine and hardwood seed to determine whether mutations might be induced.

3. A start toward evaluation and measurement of the range of genetic variability in species and races of some commercial hardwoods, the initial work to begin on yellow-poplar and redgum.

In the field of forest genetics education, we offer no genetics course, as such, in the School of Forestry. However, advanced undergraduates are encouraged to select the general genetics course offered by the Genetics Department as an elective. Several of the Master's candidates select one or more genetics courses in their graduate program, and some choose genetics as a minor field. North Carolina State College is prepared to offer both the Master's and the Doctoral degree in forest genetics; she has a Genetics Faculty of 28 distinguished scientists at present, this faculty cutting across departmental lines. In addition, the Institute of Statistics greatly strengthens the whole program of teaching and research in the field of genetics.