Pine

Selection of superior trees from natural forests

As the University of Florida celebrates its 150-year anniversary, the Cooperative Forest Genetics Research Program (CFGRP) begins its third generation of genetic improvement and gene conservation of southern pine. The CFGRP, founded in 1953 by geneticists Tom Perry and Ray Goddard, is a cooperative organization composed of FAES scientists working together with private industries and state agencies to develop genetically improved varieties of slash pine (*Pinus elliottii*), loblolly pine (*P. taeda*), longleaf pine (*P. palustris*) and sand pine (*P. clausa*). Through faster growth and greater disease resistance, plantations of improved southern pine yield up to 45 percent more usable wood per acre at harvest than the unimproved plantations.

By the 1930s, much of the natural forest in Florida had been depleted and many of the remaining trees were poor in quality and diseased. As Florida's population increased, the demand for wood and wood products grew rapidly. Concern about the depleted forests prompted the need for a reforestation program.

In the early 1950s, the CFGRP began the first generation of tree improvement by inspecting natural pine forests in the southeast and selecting over 4,000 southern pine trees that were superior in their size, form and health. These selected trees were brought to common locations (called seed orchards) dispersed throughout the southeast where

Mating of selected trees in seed orchards

Testing of improved pine families

the selected trees mated at random to produce genetically superior and more genetically diverse seed than what is produced in natural forests. Seed collected in the orchards was planted into forest tree nurseries, producing improved seedlings, which, in turn, were then planted on harvested forestlands to produce faster-growing and healthier forest plantations.

The best first-generation selections were used in controlled cross-matings to produce even better pine families. These improved pine families were then planted into field tests to assess their growth, straightness and health. The second generation of tree improvement began in 1985 when geneticist Tim White became CRCRP Director. The cooperative selected the best trees from the best families in the field tests. More than 1000 genetically improved slash pines were selected in the second generation, and the breeding and testing phases of this generation were completed in 2002. Third generations are being made in 2002 and 2003 with breeding and testing planned for 2004-2010.

Each year, over 1.3 billion improved southern pine seedlings are planted on over 1.6 million acres in the southeastern United States. Ninety percent of all commercial tree plantings in the southeastern United States employ genetically improved seedlings. First-generation slash pine plantations are expected to produce 14 percent more wood and have 18 percent less disease than unimproved plantations. Second-generation slash pine plantations are expected to produce 35 percent more wood and have 60 percent less disease, which will result in 45 percent more harvestable wood.

Genetically improved seedings for reforestation