

- ◆ Genetic diversity is important for all forest users.
- ◆ It has both economic and ecological value.
- ◆ Loblolly pine contains a high level of natural genetic diversity, and tree improvement programs are committed to maintaining genetic diversity in trees for the future.



The Western Gulf Forest Tree Improvement Program is a cooperative tree breeding project founded in 1969 with the objective of providing the best genetic quality seed for use in forest regeneration programs in the Western Gulf Region of the United States. Current members include five states and 11 industrial members collectively responsible for planting 300,000,000 seedlings per year. The cooperative is preserving and improving populations of five southern pine species and several hardwood species.

Membership, Pine Program:

Arkansas Forestry Commission
 Boise Cascade Company
 The Bosch Nursery, Inc.
 Champion International
 Deltic Timber Corporation
 International Paper Company
 Louisiana Department of
 Agriculture and Forestry
 Louisiana-Pacific Company
 Mississippi Forestry Commission
 Oklahoma Forestry Services
 Potlatch Corporation
 Temple-Inland Forests
 Texas Forest Service
 The Timber Company
 Weyerhaeuser Company
 Willamette Industries, Inc.
 International Forest Seed Company
 Louisiana Forest Seed Company, Inc.
 Netafim Irrigation, Inc.
 Robbins Association

Western Gulf Forest Tree Improvement Program
 Forest Science Laboratory
 College Station, Texas 77843-2585
 URL: www.ars-grin.gov/misc/wgftip/index.html

Texas Forest Service
 A Member of The Texas A&M University System

Circular 300

Front Cover: One of 89 Geographic Seed Source Study Locations

Western Gulf Forest Tree Improvement Program

Tree Improvement and Genetic Diversity in Loblolly Pine



The Western Gulf Forest
Tree Improvement Program:
A Genetics Cooperative
Since 1969

What is Genetic Diversity?

- Genetic diversity separates species.
- Genetic diversity makes individuals within a species different, even when the effects of the environment are constant.
- Genetic diversity within a species exists between geographic regions, stands within regions and trees within stands.

Why is Genetic Diversity Important?

- Genetic diversity is important to the health of a species.
- Genetic diversity allows a species to adapt to changes in the environment.



A Select Tree in a Natural Stand



The Natural Range of Loblolly Pine

- ◆ Loblolly pine is one of the widest-ranging and most economically important conifers in the Southern United States, harvested for both pulpwood and solid wood products.
- ◆ Loblolly pine is not threatened or endangered, because new stands are planted or naturally regenerated on millions of acres every year.
- ◆ Conserving **genetic diversity** is an important aspect of sound species management.



Marking a Selection in a Plantation

How do Tree Improvement Programs Affect Genetic Diversity?

- Genetic diversity is the raw material for tree improvement programs.
- Tree improvement programs work with a sample of the genetic variability present in the natural population.
- Breeding populations are managed to enhance variation, which can result in genetic combinations not seen in the natural population.
- Breeding populations are often subdivided. This avoids inbreeding in the production population and ensures a high level of genetic diversity in the breeding population.
- Tree improvement programs are careful not to rely on only one or a few genotypes.



Trees Grafted for Gene Preservation