

**D&PL GLOBAL ADVANCED TESTING PROGRAM
GENETIC DIVERSITY, EFFICIENCY**

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Abstract

Delta and Pine Land Company has developed a new program to facilitate germplasm exchange and broad scale testing. This program is referred to as the “Global Advanced Testing Program”. Superior germplasm from ten global D&PL breeding programs is exchanged and tested in a formalized program to provide a standardized database which includes information on yield, fiber quality and disease reaction.

The program coordinates the testing and exchange of material from seven US breeding programs spanning the Cotton Belt from east to west and three international breeding programs (located in Brazil, Australia and Greece). Each breeding program develops new lines that are specifically adapted to their respective regions by utilizing their germplasm as well as local public germplasm. The very best lines identified within each program are submitted to a standardized testing program across all regions. This allows for the identification of material that is broadly adapted as well as allows each breeder to evaluate new germplasm potentially of benefit in their local regions that combines different genetic backgrounds.

Each year a total of 100 to 125 superior lines representing the best material from each breeding program is tested across ten regions (excluding transgenics from areas in which those products are not approved for testing or sale). Also experimental lines from outside the company, which have been obtained through formal testing agreements, are entered into the testing program. Standardized checks are used across regions and seed quality is standardized as seed for all experimental lines comes from our Breeder Seed Increase Program in Arizona. The lines submitted are split between the conventional and transgenic categories. D&PL breeding programs focus primarily on developing superior conventional lines with the vast majority of their crosses, progeny rows and yield trials being conventional material. The Advanced Testing Program (ATP) is used to identify broadly adapted conventional lines combining high yield and excellent fiber properties for ultimately incorporating the newest gene technologies. After evaluating the transgenic versions of this superior germplasm within a breeding program the selected lines are then re-submitted to the ATP as transgenic lines to be evaluated on a broad scale basis.

Data collected includes yield, fiber characteristics, plant height and maturity, stormproofness or string-out and relevant information on reaction to nematodes, Fusarium wilt, Verticillium wilt, bronze wilt, bacterial blight and other diseases specific to particular areas of the world. Data is summarized in a standard format and stored over years for use by all D&PL breeders. The breeders use this information in presentations within the company to propose potential new varieties as well as to identify new parents for combining traits lacking within their breeding programs. The data on lines advanced for potential commercialization is also moved into the company head-to-head comparison system. This information is also made available to many cooperators outside the company so that even varieties new to the market are accompanied by a substantial amount of performance information.

This program provides for efficient use of company resources including germplasm, professional breeder expertise, equipment and test sites as well as facilitating germplasm exchange for the purpose of broadening genetic diversity and thus enabling long-term genetic improvement.