

PERFORMANCE OF CONVERTED RACE STOCKS IN A BC₂F₂ GENERATION

Christopher Souder, C.W. Smith, and P.M. Thaxton

Texas A&M University

College Station, TX

O.L. May

University of Georgia

Tifton, GA

Abstract

Twenty-four BC₂F₂ populations were developed by backcrossing twenty-four converted race stocks to TAM 94L-25 as the recurrent parent. The converted race stocks were obtained from Dr. Jack McCarty USDA, Starkville, MS. The objectives of the parent project was to develop backcross populations that were phenotypically similar to the recurrent parent but having alleles of the donor parent distributed throughout the backcross genome. This provided the opportunity to evaluate these 24 BC₂F₂ populations for transgressive segregation for agronomic and fiber traits via performance testing in Texas and Georgia. The initial crosses were made in the summer of 1998, and enough BC₂F₂ (OP) seed was available to determine quality performance at College Station, TX (irrigated), Thrall, TX (non-irrigated), and Tifton, GA (irrigated), during the summer of 2002. Three replications of each BC₂F₂ population, along with TAM 94L-25 and PSC 355 (commercial check), were grown in a randomized complete block design. Populations were harvested using a single row plot harvester and fiber was analyzed using HVI by the International Textile Center at Texas Tech University. Twenty-one populations had greater yield than the recurrent parent (94L-25) in College Station, while seven were greater at Thrall and four were greater at Tifton. Gin turn-out, micronaire, and uniformity index were all similar to 94L-25 in all three locations. Four populations (TX0062, TX0067, TX0043, and TX0057) showed transgressive segregation for fiber length at College Station. TX0062 was the only population at Thrall to show transgressive segregation for fiber length. Four populations (TX0062, TX0077, TX0067, and TX0057) had greater strength than 94L-25 at College Station, while all populations were similar to TAM 94L-25 in fiber strength at Thrall and Tifton. Three populations (TX0024, TX0040, and TX0033) showed transgressive segregation at Tifton for elongation but all populations were not different than L-25 at College Station and Thrall. The performance of these BC₂F₂ populations suggests that breeders should use TX0007, TX0017, TX0024, TX0040, TX0048, TX0055, TX0061, TX0063, TX0072, and TX0063 when breeding for yield potential, and TX0024, TX0033, TX0040, TX 0043, TX0057, TX0062, TX0067, and TX0077 when breeding for fiber properties.