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Stability Comparisons Between Conventional And Near-Isogenic Transgenic Cotton Cultivars

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Pages: 17-28
Breeding and Genetics

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Multi-environment trials are conducted yearly and mean performance is often calculated as an average of cultivar performance over years and locations; however, comparisons of mean performance are not sufficient for cultivar evaluation without an understanding of genotype by environment (GE) interactions. Studies were conducted in 2001 and 2002 to evaluate the performance and stability of fiber yield (boll weight, lint per boll, lint percentage, fuzzy seed index, seed index of acid-delinted seed, and lint weight) and quality characters (micronaire, strength, length, uniformity, and elongation) among conventional cotton cultivars and their backcross-derived transgenic counterparts. A graphic summary of the data using GGE Biplot was used to characterize GE interactions and make comparisons between conventional and transgenic cultivars. Statistical analyses were performed to determine which traits were affected by GE interactions. Traits that were affected by GE interactions were analyzed in GGE Biplot, and differences, based on environment, between conventional and transgenic cultivars were further examined. Plant height, number of nodes, height to node ratio, fuzzy and delinted seed index, and yield had significant GE interactions. Transgenic cultivars were taller, had greater height to node ratios, larger seed, and lower lint percentages. Transgenic cultivars containing the Bollgard gene yielded more than their conventional parents. The cultivar with the lowest GE interaction for lint yield was Stoneville 4691B, which was also the highest yielding cultivar in the study.