

## **LARGE-PLOT REPLICATED DRYLAND SYSTEMS CULTIVAR TRIALS IN THE TEXAS HIGH PLAINS**

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### **Abstract**

Small-plot cotton (*Gossypium hirsutum* L.) cultivar testing generally includes evaluation of genetic components but not genetics in concert with management programs. Characteristics commonly evaluated in small-plot testing include lint yield, turnout percentages, fiber quality, and earliness. Industry continues to increase the number of herbicide-tolerant, insect-resistant, and "stacked gene" cultivars. The proliferation of transgenic cultivars in the marketplace is expected to continue. Current small-plot cultivar testing programs are inadequate in scale and design to determine the economic impact of new cultivars and value-added traits. The objective of this project was to compare yields, gin turnout, fiber quality, and economics of conventional and transgenic cultivars under dryland production systems in the Texas High Plains. All sites were established using a randomized complete block design with three replications. All plots were four rows wide and varied in length from 800 to 1700 ft depending upon location. The 2003 Dawson County site was solid planted in 40-inch rows on 30-May, and was harvested on 19-Nov. The 2003 Lamb County site was planted to a plant 2 and skip 1 row pattern in 40-inch rows on 28-May, and was harvested 3-Dec. The 2004 Crosby County site was solid planted in 40-inch rows on 11-May, and was harvested on 19-Oct. Conventional and transgenic cultivars were managed within their respective herbicide systems. Expenses during the growing season were recorded for each herbicide management system. Overall systems costs included differential herbicide applications and their respective costs, and seed and technology fees for each cultivar at each site based on the producer-cooperator's seeding rate. The trials were planted using commercial planting equipment. Plots were harvested with commercial cotton strippers and weights were captured using a CrustBuster weigh wagon equipped with integral digital scales. Grab samples were obtained from stripper-harvested material by plot then ginned on plot-ginning equipment at the Texas A&M University Research and Extension Center at Lubbock. Lint samples were submitted to the International Textile Center at Texas Tech University for high volume instrument (HVI) analysis. The Commodity Credit Corporation Loan value for lint by plot was determined using the year's respective Loan chart for Lubbock. Results indicated that cultivar/system profitability was affected by weed pressure and timeliness of control in a given field. At the Dawson County site, weed pressure was generally low, and some conventional cultivars as well as Roundup Ready (glyphosate tolerant) types made significantly more profit than others. At the Lamb County site Roundup Ready cultivars were appropriate because of high weed infestations. At the Crosby County site, a good-performing conventional cultivar made more profit than some transgenics because weed infestations were very low. When choosing a cultivar, one must determine the need for a transgenic weed control system if infestations are at unacceptable levels for conventional cultivar production. In conclusion, this testing methodology seems appropriate for determining the potential value of cultivars and herbicide systems under varying weed pressures.