

**SYSTEMS AGRONOMIC AND ECONOMIC EVALUATION OF TRANSGENIC
AND CONVENTIONAL VARIETIES IN THE TEXAS HIGH PLAINS-2001**

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Abstract

Small-plot cotton variety 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. Current small-plot variety testing programs are generally inadequate in scale and design to investigate the economic impact of new transgenic varieties with value-added traits. The objective of this project was to evaluate the profitability of various transgenic cotton varieties when compared to conventional types in producer's fields. Three replications of each variety were included at each location. Plot size was of sufficient size to enable the compositing of all replications of each individual variety into a single module at harvest. Each individual variety had at least three acres total (approximately one acre per plot with three replications equals three acres total). Plot weights were determined at harvest using a boll buggy with integral electronic scales. Modules were followed through the ginning process to determine lint turnout, USDA fiber quality, and loan value. Three producer-cooperator locations were utilized for this project. Insect control measures were uniform across varieties at all locations. In the high-yielding environment near Muleshoe, several varieties statistically produced the same net value. Two of the top 5 varieties were conventional types (FiberMax 819 and Deltapine 2156). Paymaster 2379RR and Paymaster 2326RR numerically produced the highest net value. Stoneville BXN 16 variety and system produced significantly lower net value per acre than some of the Roundup Ready varieties and the conventional FiberMax 819. In the lower-yielding environment near Cone, FiberMax 989 and FiberMax 958 produced the highest net values/acre compared to other varieties. Discounts for short staple and high micronaire contributed to lower loan value for several varieties, and reduced the overall net value/acre. In the second "tier" of significance was four additional varieties, including FiberMax 5015, FiberMax 989BG/RR, Paymaster HS26, and Paymaster 280. The only transgenic variety to place in the top six ranking for net value/acre was FiberMax 989BG/RR, which exhibited medium yield, but superior fiber properties. In the moderately high-yielding environment at Tokio, FiberMax 989BG/RR produced significantly greater net value/acre than all other varieties. Of the top six varieties in terms of net value/acre at this site, three were transgenic (FiberMax 989BG/RR, Stoneville 2454R and Paymaster 2280BG/RR) and three were conventional (FiberMax 958, FiberMax 989, and AFD 2050). There was an average of \$57.85 benefit to varieties with the Bollgard gene in similar genetic backgrounds. Results from the 2001 production season at three varying locations in the Texas High Plains indicate that some transgenic Roundup Ready and Roundup Ready/Bollgard stacked gene varieties can be competitive with standard conventional varieties in terms of production economics. However, at one lower-yielding location, conventional varieties produced the highest net values/acre. FiberMax picker varieties were consistent top performers in terms of net value/acre. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. The differences in net value when comparing the top and bottom varieties were \$219, \$125, and \$236/acre for Muleshoe, Cone, and Tokio, respectively. It should be noted that no inclement weather was encountered in these trials prior to harvest. High intensity rainfall and/or high wind events were not experienced to potentially cause pre-harvest losses with the open boll picker-type varieties (FiberMax 958, FiberMax 989, FiberMax 989BG/RR) or the lesser-stormproof stripper types (Stoneville 2454R and Stoneville BXN 16). Producers should take note that the harvest period optimum encountered in 2001 is not considered "normal" for the Texas High Plains.