

COMPARISON OF COTTON CULTIVARS WITH BIOENGINEERED GENES FOR YIELD DRAG

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ABSTRACT: Twenty of the most widely used Roundup Ready, Roundup Ready with Bollgard, Bollgard, and conventional varieties were evaluated for yield in 2001. The weather was favorable for cotton production with very little shedding taking place in the study. Hooked-billed bolls and boll cavitation, the classic symptoms of adverse reaction to Roundup was not detected. There were some varieties with significant difference within the block in which they were tested. Yield differences among blocks were not detected indicating no yield differences between Roundup Ready varieties yielding 1052 lbs lint/A, Bollgard, yielding 1086 lbs lint/A, Bollgard Roundup Ready yielding 1108 lbs lint/A and conventional varieties yielding 1040 lbs lint/Acre.

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MATERIALS AND METHODS: Twenty cotton varieties were planted in four separate blocks on May 1. The experimental design was a split-block with five varieties per block and replicated four times. At planting the entire plot area was oversprayed with Cotoran (fluometuron) at 1.0 lb ai/ac. Blocks containing Roundup Ready varieties were sprayed with Roundup for weed control. Non Roundup Ready blocks received Staple (pyrithiobac) 0.06-oz ai/ac and Poast (sethoxydim) 0.25 ai/ac to control the weeds and grasses as needed. Scouting twice weekly from planting until harvest monitored insects. When threshold levels for specific insects were reached, appropriate insecticides were applied according to label directions. A defoliation of Prep (ethephon) at 1.5 lb. ai/ac and Def (tribufos) at 1.5 lb. ai/ac was done on September 24. Harvesting of these varieties was done on October 16.

RESULTS AND DISCUSSION: Problems with Roundup Ready cotton that have occurred in the past such as hooked-billed shaped bolls, cavitation of bolls and poor fruit retention were not evident in any variety. Injuries from herbicides of the classical symptoms were nonevent in this study. Results from this study can be viewed as yield potential of Roundup Ready, Roundup Ready w/Bollgard, Bollgard, and conventional varieties.

A non-significant difference was noted for blocks in this study. In general, yields were high for all systems and very likely economically unfeasible for any of the system with today's cotton prices. Most often yield difference is a result of weed competition or other environmental conditions; however, in this study factors impacting yield other than genetics had little influence. Based on research experience with Roundup Ready cotton for the past years, yields have lagged behind varieties in other categories, until the last year where the new Roundup Ready varieties didn't show a yield drag as in past years. This indicates the cotton breeders are doing a better job of inserting the gene in the new varieties and selecting varieties for yield. Yield data is listed in Table 1.

Table 1. Yield comparison of conventional, Bollgard, Roundup Ready/Bollgard, and Roundup Ready Varieties for yield.

VARIETY	LBS LINT/A	VARIETY	LBS LINT/A
DP425RR	1128	DP20B	1201
DP436RR	1180	DP428B	1103
PM1199RR	984	DP33B	1002
SG521R	1017	PM1560BG	983
STN4793R	961	STN4691B	1143
MEAN OF RR VAR	1052	MEAN OF BG VAR	1086
LSD 0.05	70	LSD 0.05	35
DP451B/RR	1146	DP491	1023
PM1218BG/RR	1058	PSC355	1051
SG215BG/RR	1142	SG747	1067
SG125BR	1029	SG105	1051
SG501BR	1170	AP9257	1013
MEAN OF BR VAR	1008	MEAN OF CONV VAR	1040
LSD 0.05	37	LSD 0.05	27