EVALUATION OF TRANSGENIC VERSUS CONVENTIONAL VARIETIES D. Eddie McGriff and Joel E. Hudgins Cooperative Extension Service, University of Georgia Bainbridge, GA Steve M. Brown University of Georgia Tifton, GA

Abstract

Most University cotton variety tests are conducted to determine the genetic potential of each variety, hence, all varieties are treated the same. This study was undertaken to determine how each variety would perform in their designed technology system. Each variety was planted in a block of their technology system-- Bollgard (Bt); roundup ready (RR); stacked (BT/RR) or conventional-- and treated accordingly.

Introduction

Twenty-seven conventional and twenty-three (ten stacked (B/RR); eight bollgard (Bt); and five Roundup Ready (RR)) transgenic cotton varieties were replicated four times in a complete block design. Plots were four rows wide, on 36 inch centers and 150 feet in length. The two inside rows were harvested. Plots were planted under irrigation in a Lucy soil in Decatur County, Georgia. Each technology system was scouted for insects and weeds twice per week and sprayed according to University of Georgia Extension recommendations.

Materials and Methods

- May 1 1 quart/acre Gramoxone Extra appplied as burndown
- May 14/15 Planting Date At Plant: 4.0 lbs/acre Temik applied in-furrow 17 gallons 10-34-0 dribbled on top of the ground two inches to side of seed Seeding Rate: 3.5 seed/foot NonBt and Bt: Broadcasted 1 qt Prowl + 1 qt Cotoran 4L/acre Preemerge RR and RR/Bt: Broadcasted 1 qt Prowl/acre
- Preemerge

Jun 2 Broadcast 300 lbs 0-7-28/acre (all treatments)

- Jun 7/8 Applied 20 gallons of 28-0-0-5/acre (all treatments)
- Jun 8 Sprayed 1 qt Roundup Ultra on RR and B/RR
- Jun 22 Sprayed ¹/₂ pt PixPlus + 1 lb Solubor/acre (all treatments)
- Jun 23/24 Direct sprayed 1 qt Bladex + 2.67 pints MSMA + 1 qt crop oil conc./per acre on all treatments (direct spray was necessary on Roundup Ready plots oversprayed with Roundup Ultra due to the presence of nutsedge)
- Jun 29 Sprayed 2.6 oz Karate Z/acre on conventional and RR

treatments

Jul 2 Sprayed 16 oz Pix + 1 lb Solubor/acre (all treatments)

- Jul 2/3 Broadcast 275 lbs 0-0-40 plus 25 gallons of 28-0-0-5/acre (all treatments)
- Jul 7 Sprayed 2.5 oz Tracer/acre on conventional and RR treatments
- Jul 12 Sprayed 2 oz Karate Z/acre (all treatments)
- Jul 28 Sprayed 1.9 Decis plus 2 gals urea/acre (all treatments)
- Aug 3 Sprayed 2 oz Karate Z/acre plus 2 pts Persist/100 gallons on conventional and RR treatments
- Aug 11 Sprayed 2 oz Tracer/acre plus 2 pts Persist/100 gallons on conventional and RR treatments
- Sep 24 Sprayed 2 b pints Prep + .125 lb Dropp + 4 oz Folex/acre (all treatments)
- Oct 18/20 Harvested reps 1-3
- Oct 18/22 Plant mapped reps 1-4
- Oct 25 Ginned cotton at Coastal Plains Experiment Station for gin turnout and brought ginned sampled to USDA cotton classing lab in Macon
- Nov 1 Harvested rep 4

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Results

Twenty-seven conventional varieties averaged 1,223 lbs./acre; five Roundup Ready (RR) varieties averaged 1,134/acre; ten stacked (B/RR) varieties averaged 1,127 lbs/acre; and eight bollgard (Bt) varieties averaged 1,107 lbs/acre. There was no significant yield difference between the transgenic varieties and conventional varieties when taken as a group (least significant difference was 144 lbs/acre). A comparison between the conventional parent and transgenic progeny also showed no significant yield difference. Six conventional parents averaged 1,176 lbs/acre compared to their six stacked (B/RR) progeny which averaged 1150 lbs/acre. Three conventional parents averaged 1173 lbs/acre compared to their three Bollgard progeny which averaged 1196 lbs/acre. Four conventional parents averaged 1176 lbs/acre compared to their four RR progeny which averaged 1148 lbs/acre.

1999 Decatur County Cotton Variety Test

1999 Decatur County		Test
	YIELD	2 YEAR (1998-99)
VARIETY	LBS/ACRE	AVERAGE LBS/ACRE
Delta Pearl	1329	1311
AgriPro 6101	1325	1276
Suregrow 180	1319	1384
HS 46	1318	1360
Phytogen 952	1314	
AgriPro 7115	1311	1219
Suregrow 821	1297	1204
Suregrow 747	1274	
HS 44	1265	
Paymaster 1440	1254	1205
DPL 428B	1250	1290
AgriPro 4103	1248	
Paymaster X425	1244	1201
DPL 458 B/RR	1240	1331
Phytogen HS12	1220	1153
Suregrow 501 B/RR	1219	1295
Suregrow 248	1209	1178
DPL 5111	1196	1223
DPL 5415 RR	1196	1163
DPL 425 RR	1193	1081
FiberMax 989	1189	1125
DPL 51	1189	1222
Surgrow 501	1188	1222
Phytogen GA161	1186	1204
Surgrow 125	1186	1226
DPI 5415	1177	1220
DPI 451 B/RR	1175	1177
Suregrow 125 B/RR	1173	1221
DPI 33B	1172	1221
DDI 25D	11/1	1280
DPL 20	1164	
DPL 20	1104	1122
Stepeville 474	1152	1122
DDI 299	1131	
DFL 300 Devenoater 1218 D/DD	1152	
DDI 450 D/DD	1127	
DPL 430 B/KK	1120	1140
Sulegiow 105	1117	1050
Suregrow 585B	1109	1050
Suregrow 125 KK	1102	1148
DPL 5690 KK	1099	
DPL 50B	1095	
DPL 409 B/RR	1092	1004
DPL 422 B/RR	1088	1094
Suregrow 585 RR	1081	1156
DPL 675	1055	
DPL 90B	1047	
Paymaster 1560 B/RR	1033	
DPL 448 B	1020	1070
DPL 655 B/RR	1006	
BXN 47	996	
PLOT AVERAGE	1176	

Conventional Parent Compared to Transgenic Progeny		
VARIETY	1999 YIELD	
Conventional Variety - DPL 51	1189	
Bt Variety - DPL 428 B	1250	
RR Variety - DPL 425 RR	1193	
B/RR Variety - DPL 451 B/RR	1175	
Conventional Variety - DPL 5415	1177	
Bt Variety - DPL 33 B	1171	
RR Variety - DPL 5415 RR	1196	
B/RR Variety - DPL 458 B/RR	1240	
Conventional Variety - DPL 5690	1152	
Bt Variety - DPL 35 B	1168	
RR Variety - DPL 5690 RR	1099	
B/RR Variety - DPL 655 B/RR	1006	
Conventional Variety - Suregrow 125	1186	
RR Variety - Suregrow 125 RR	1102	
B/RR Variety - Suregrow 125 B/RR	1172	
Conventional Variety - DPL 20	1164	
B/RR Variety - DPL 422 B/RR	1088	
Conventional Variety - Suregrow 501	1188	
B/RR Variety - Suregrow 501 B/RR	1219	