

**PAYMASTER'S PICKER TYPE TRANSGENIC
COTTON VARIETIES FOR 1997**
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Abstract

Paymaster Technology Corp. announces the release of five new picker type Roundup Ready™ cotton varieties, PM 1215 RR, PM 1220 RR, PM 1244 RR, PM 1330 RR and PM 1560 RR; five new picker type Bollgard™ cotton varieties, PM 1215 BG, PM 1220 BG, PM 1244 BG, PM 1330 BG and PM 1560 BG; and four new picker type Bollgard™ and Roundup Ready™ cotton varieties, PM 1220 BG/RR, PM 1244 BG/RR, PM 1330 BG/RR and PM 1560 BG/RR. The Roundup Ready™ (RR) varieties contain the EPSPS gene developed by Monsanto that gives tolerance to the herbicide Roundup Ultra®. The Bollgard™ (BG) varieties contain the Bollgard gene from *Bacillus thuringiensis* (Bt) also developed by Monsanto. Each of these varieties was bred by transferring the Roundup Ready™ and/or Bollgard™ genes from transformed Coker 312 cotton by the backcrossing breeding method to the early maturing recurrent parents H 1215, H 1220, H 1244 and H 1330 and to the medium maturing variety H 1560. Performance tests by Paymaster in 1996 indicate that these transgenic varieties have outstanding yield potential, excellent fiber properties and plant morphology similar to the recurrent parent. Area of adaptation appears to be the same as that of the recurrent parents. Paymaster Technology Corp. is the first company to introduce both Roundup Ready™ and Bollgard™ in the same variety.

Introduction

Paymaster Technology Corp. is releasing for 1997, fourteen transgenic picker type cotton varieties of which five, PM 1215 RR, PM 1220 RR, PM 1244 RR, PM 1330 RR and PM 1560 RR, are tolerant to the herbicide Roundup Ultra®; five, PM 1215 BG, PM 1220 BG, PM 1244 BG, PM 1330 BG and PM 1560 BG, have the Bollgard™ gene; and four, PM 1220 BG/RR, PM 1244 BG/RR, PM 1330 BG/RR and PM 1560 BG/RR have both the Roundup Ready™ and Bollgard™ gene developed by Monsanto. The varieties were developed by transferring the Roundup Ready™ and Bollgard™ genes from transformed Coker 312 to the recurrent parents, H 1215, H 1220, H 1244, H 1330 and H 1560 by the backcrossing breeding method. Dr. J.E. Jones, Louisiana Agricultural Experiment Station, selected what was later named H 1215, H 1220 and H 1244 from the cross MCT8-27-8C x LA HG063 and H 1560 from the cross LA 434-1031-C x DES 119. H 1330 was developed by Dr.

Fred Bourland, University of Arkansas, from the cross DES 119 x MISCOT 7803-52.

Methods

Replicated yield tests were conducted at ten locations in 1996. Tests were on farms in Texas, Louisiana, Mississippi, Tennessee and Arkansas under farmer management for all agronomic practices except planting and harvest. Fiber data and boll size are from 50 boll samples taken at each site. Selected locations were machine picked twice to obtain maturity data. Fuzzy seed size estimates were made from 400 seeds from each of three locations.

Results

Yield of the Round Ready™ varieties was about the same as the recurrent parent (Table 1) as an average of ten locations, except for PM 1560 RR which yielded significantly less than H 1560. Seed of these varieties was grown in Argentina November - March 1995 - 96. Seed quality of PM 1560 RR was lower than that of the earlier maturing varieties and may be responsible for the lower yield. Fiber length differences were small between each Roundup tolerant variety and its respective recurrent parent but tended to be the same to slightly lower. PM 1244 RR had fiber 0.03 inches shorter than H 1244, a small but significant difference. No real differences occurred in fiber strength when comparing the backcross with the recurrent parent. Small non significant differences occurred for micronaire except that PM 1244 RR had significantly higher micronaire than H 1244. Minor differences were found for seed size.

Yield of each of the varieties containing Bollgard™ was higher than its recurrent parent ranging from 12 lbs/acre for PM 1215 BG to 111 lbs/acre for PM 1220 BG although differences were not significant at the 5% level (Table 2). Differences between the Bollgard variety and its recurrent parent were very small and non significant for fiber length, strength and micronaire. Seed size was numerically smaller for four of the five Bollgard varieties than that of their respective recurrent parent, but differences were not statistically significant at the 5% level.

Performance of the varieties containing both Bollgard™ and Roundup Ready™ genes is presented in Table 3. Yield comparisons of stacked gene varieties with their respective recurrent parent shows a small numerical increase for PM 1220 BG/RR and PM 1244 BG/RR, essentially no difference in PM 1330 BG/RR, but a significant decrease of 181 lbs of lint per acre for PM 1560 BG/RR. Seed of the PM 1560 BG/RR variety produced in the winter nursery was of marginal quality and this is believed to be the major cause of the lower yields. Seed size of PM 1560 BG/RR was significantly smaller than H 1560 while the seed size for the other varieties was similar to its recurrent parent.

The very good lint percent of the recurrent parents was generally maintained or numerically improved in the RR, BG and BG/RR varieties (Tables 4,5 and 6). Lint percent of PM 1330 RR and PM 1560 BG/RR was significantly higher than H 1330 and H 1560, respectively. No backcrossed variety had a significantly lower lint percent than its recurrent parent.

Boll size differences only occurred in three of the varieties where it was significantly larger in PM 1244 RR than H 1244 while boll size was significantly reduced in PM 1560 BG and PM 1560 BG/RR in comparison with H 1560.

Maturity based on the percent first pick of the transgenic varieties is similar to that of the recurrent parents. PM 1244 RR was the exception being significantly later than H 1244.

Plant mapping data will be presented by Dr. David Albers in Fruiting Patterns, Maturity and Yield of Bollgard™ and Roundup Ready™ Cotton Varieties at the Cotton Improvement Conference Thursday, January 9.

Table 1. Performance of five Paymaster Technology Corp. Roundup Ready™ cultivars compared with the recurrent parent, STV LA887 and DP 50 cotton, 1996.

Cultivar	Lint/Acre lbs	Length in	Strength g/tex	Mic	Seed Size* g/100
PM 1215 RR	1402	1.14	29.9	4.9	12.5
H 1215	1343	1.16	29.7	4.9	12.6
PM 1220 RR	1411	1.14	29.2	5.0	12.5
H 1220	1385	1.16	29.0	4.9	12.5
PM 1244 RR	1391	1.11	28.9	4.9	12.3
H 1244	1394	1.14	29.1	4.6	12.1
PM 1330 RR	1242	1.14	29.3	4.8	10.9
H 1330	1246	1.15	29.7	4.7	11.4
PM 1560 RR	1209	1.16	29.1	4.5	11.1
H 1560	1367	1.16	29.4	4.6	11.7
STV LA887	1241	1.16	30.0	4.7	12.0
DP 50	1271	1.15	27.5	4.6	10.3
LSD .05	124	0.03	1.1	0.3	0.9
Tests in mean	10	8	8	8	3

* Fuzzy seed

Table 2. Performance of five Paymaster Technology Corp. Bollgard™ cultivars compared with the recurrent parent, STV LA887 and DP 50 cotton, 1996.

Cultivar	Lint/Acre lbs	Length in	Strength g/tex	Mic	Seed Size* g/100
PM 1215 BG	1352	1.17	29.4	4.7	11.8
H 1215	1340	1.16	29.7	4.9	11.8
PM 1220 BG	1484	1.14	28.2	4.7	12.2
H 1220	1373	1.15	27.1	4.9	12.7
PM 1244 BG	1415	1.14	28.6	4.4	11.8
H 1244	1376	1.14	28.4	4.5	12.2
PM 1330 BG	1316	1.15	30.0	4.6	10.7
H 1330	1241	1.15	29.5	4.6	11.2
PM 1560 BG	1385	1.15	28.4	4.6	10.6
H 1560	1322	1.15	29.6	4.6	11.2
STV LA887	1210	1.16	30.4	4.6	11.5
DP 50	1276	1.14	28.0	4.7	10.8
LSD .05	121	0.03	1.2	0.3	0.7
Tests in mean	10	8	8	8	3

* Fuzzy seed

Table 3. Performance of four Paymaster Technology Corp. Bollgard™/Roundup Ready™ cultivars compared with the recurrent parent, STV LA887 and DP 50 cotton, 1996.

	Lint/Acre lbs	Length in	Strength g/tex	Mic	Seed Size* g/100
PM 1220 BG/RR	1462	1.14	29.1	5.0	12.2
H 1220	1385	1.16	29.0	4.9	12.5
PM 1244 BG/RR	1462	1.14	29.4	4.6	12.4
H 1244	1394	1.14	29.0	4.6	12.1
PM 1330 BG/RR	1241	1.15	28.7	4.6	11.2
H 1330	1246	1.15	29.7	4.7	11.4
PM 1560 BG/RR	1180	1.13	28.8	4.6	10.6
H 1560	1367	1.16	29.4	4.6	11.7
STV LA887	1241	1.16	30.0	4.7	12.0
DP 50	1271	1.15	27.5	4.6	10.6
LSD .05	124	0.05	1.1	0.3	0.09
Tests in mean	10	8	8	8	3

* Fuzzy seed

Table 4. Comparison of lint percent, boll size and percent first pick of five Paymaster Roundup Ready™ cotton cultivars with their recurrent parent, STV LA887 and DP 50 cotton, 1996.

Variety	Lint %	Boll Size g	First Pick %
PM 1215 RR	39.1	5.57	87.9
H 1215	38.4	5.34	90.2
PM 1220 RR	39.8	5.84	86.7
H 1220	39.1	5.82	87.8
PM 1244 RR	40.1	6.06	82.1
H 1244	39.4	5.53	87.1
PM 1330 RR	38.6	5.69	88.5
H 1330	37.5	5.77	87.9
PM 1560 RR	38.9	5.76	80.3
H 1560	38.5	5.82	80.1
STV LA887	39.1	6.18	79.8
DP 50	35.9	5.45	84.3
LSD .05	0.9	0.31	4.1
Tests in mean	10	9	6

Table 5. Comparison of lint percent, boll size and percent first pick of five Paymaster Bollgard™ cotton cultivars with their recurrent parent, STV LA887 and DP 50 cotton, 1996.

Cultivar	Lint %	Boll Size g	First Pick %
PM 1215 BG	38.4	5.36	91.6
H 1215	39.1	5.61	90.7
PM 1220 BG	39.7	5.72	90.8
H 1220	39.6	5.75	90.2
PM 1244 BG	39.2	5.67	90.0
H 1244	39.5	5.61	89.3
PM 1330 BG	38.0	5.51	91.1
H 1330	37.9	5.66	89.0
PM 1560 BG	39.8	5.12	87.1
H 1560	39.3	5.75	82.3
STV LA887	39.0	6.17	81.5
DP 50	36.3	5.45	86.1
LSD .05	0.8	0.38	3.0
Tests in mean	10	9	6

Table 6. Comparison of lint percent, boll size and percent first pick of four Paymaster Bollgard™/Roundup Ready™ cotton cultivars with their recurrent parent, STV LA887 and DP 50 cotton, 1996.

Cultivar	Lint %	Boll Size g	First Pick %
PM 1220 BG/RR	39.4	5.83	88.7
H 1220	39.1	5.82	87.8
PM 1244 BG/RR	38.8	5.79	83.3
H 1244	39.4	5.53	87.1
PM 1330 BG/RR	37.0	5.56	88.2
H 1330	37.5	5.77	87.9
PM 1560 BG/RR	39.4	5.38	77.2
H 1560	38.5	5.82	80.1
STV LA887	39.1	6.18	79.8
DP 50	35.9	5.45	84.3
LSD .05	0.9	0.31	4.1
Tests in mean	10	9	6