

PM 2266 RR, A NEW MID-MATURITY STRIPPER RR VARIETY

Tom R. Speed

Delta and Pine Land Company

Lubbock, TX

Richard Sheetz

Delta and Pine Land Company

Hale Center, TX

Abstract

Delta and Pine Land Company is introducing a new high-yielding, medium-maturing stripper variety that possesses Roundup Ready® (RR) technology. PM 2266 RR represents novel germplasm to the Texas High Plains cotton producing region. PM 2266 RR was developed at Delta and Pine Land's breeding locations in Aiken, TX and Hale Center, TX by Dr. Richard Sheetz. Numerous years of testing has shown that PM 2266 RR is well-adapted to both the Northern and Southern cotton growing regions of the Texas High Plains. Delta and Pine Land data and Texas A&M University Agricultural Research and Extension Cotton Performance trial data show that PM 2266 RR has produced more lint yield per acre than PM 2326 RR and PM 2200 RR. Seed supplies of PM 2266 RR are expected to be limited for the 2002 growing season.

Introduction

Representing novel germplasm for the Texas High Plains, Delta and Pine Land will introduce PM 2266 RR as a new RR stripper-type variety. In 1997, Delta and Pine Land Company's Paymaster product line introduced the first two Roundup Ready stripper-type varieties; PM 2326 RR and PM 2200 RR. PM 2266 RR, along with other new variety introductions in 2002, represents a second generation of Roundup Ready® varieties available to growers in the Texas High Plains. This new variety is a high yielding, medium maturing variety with good fiber qualities. In terms of maturity, it is most similar to PM 2200 RR. Its intended market of adaptation will be the Northern and Southern High Plains cotton growing regions of Texas. Yield data from 2000 and 2001 have shown PM 2266 RR produces more lint per acre than PM 2326 RR and PM 2200 RR. Trial data suggests that PM 2266 RR will be a replacement variety for PM 2200 RR and that it has a competitive advantage over PM 2326 RR in many areas due to its higher yield and longer staple length.

Key-features, based on variety trial data from 2000 and 2001, include higher yield than PM 2326 RR and PM 2200 RR with slightly longer fiber than PM 2326 RR and similar fiber length as PM 2200 RR. This new variety has an open cluster plant habit, semi-smooth leaf and shorter plant height than PM 2200 RR. PM 2266 RR has averaged a lower node of first fruiting branch and tighter stormproofness when compared to PM 2200 RR. Yield consistency or stability has shown to be excellent from trials conducted in 2000 and 2001.

Materials and Methods

The parent material for PM 2266 RR was a line selected from a complex cross of P5490 x 347*355 x P404 made in 1983. A line derived from selecting in the subsequent segregating populations of this cross was given the experimental designation of PMX 126661 in 1992. Breeding lines for PM 2266 RR were developed from a cross of PMX 126661 and a Roundup Ready® donor parent. Line selections were made by Dr. Richard Sheetz and Mark Mayo at Taft, Munday, Hale Center, Inadale and Finney breeding nurseries in 1999. PM 2266 RR was tested as PMX 00V06RR in 2000 and tested as PM 2266 RR in 2001. Seed supply of PM 2266 RR is expected to be limited for the 2002 growing season.

Data reported herein are from Delta and Pine Land Company Technical Services Agronomic Service Trials (ASTs), D&PL Research trials and/or from Texas A&M official variety trials (OVTs). All data reported are from all trial data available as of December 19, 2001.

Results and Discussion

Growth and fruiting characteristics of PM 2266 RR (Table 1) are conducive to many production systems across the stripper harvested area of the Texas High Plains, enabling the variety to be widely-adapted. Yield data averaged across 32 trials in 2000 and 2001 shows PM 2266 RR outyielded PM 2326 RR and PM 2200 RR by 1.2% and 11.5%, respectively. Other characteristics averaged across these 32 trials show the following: turnout was 32.1 %, staple averaged 34.4, micronaire 4.1, strength 28.8, and uniformity averaged 82.3 for PM 2266 RR (Table 2). Micronaire values for PM 2266 RR have been consistently lower than PM 2326 RR and very similar to PM 2200 RR. Graph 1 illustrates lint yield performance of PM 2266 RR relative to PM 2200 RR.

Two lines are drawn on the graph, the darker line represents a one-to-one line, the lighter, dotted line represents the regression line or predicted performance of PM 2266 RR compared to PM 2200 RR. An r^2 of 94% suggests a relatively “tight” fit of the data around the regression line. The equation for the slope of the line is $y=1.0518x + 57.88$. This equation predicts lint yield of PM 2266 RR to be 5.18% plus 57.88 pound more than PM 2200 RR’s lint yield.

Performance Across Years

Each year presents new environments to growers, thus yield consistency or stability across years and environments is a highly desirable trait. Tables 3 and 4 illustrate yield consistency and fiber quality consistency for PM 2266 RR compared to PM 2326 RR and PM 2200 RR in 2000 and 2001. In 2000, PM 2266 RR produced 0.3% and 10.9% more pounds than PM 2326 RR and PM 2200 RR, respectively. Staple length was slightly longer and micronaire was lower than PM 2326 RR. Turnout, strength, and uniformity were very similar to PM 2326 RR. In 2001, PM 2266 RR produced 3.0% and 12.2% more pounds than PM 2326 RR and PM 2200 RR, respectively. Again in 2001, staple length was longer than PM 2326 RR and turnout, strength, and uniformity were very similar to PM 2326 RR.

Performance Versus Other Early Season RR Varieties

Tables 2, 3 and 4 demonstrate how PM 2266 RR can outyield even the more indeterminate stripper-type RR varieties, i.e. PM 2326 RR. The question may be raised of how will PM 2266 RR perform when compared to early season stripper-type RR varieties? Table 5 shows PM 2266 RR’s yield and fiber quality performance relative to PM 2156 RR and PM 2145 RR. Over the last two years, PM 2266 RR has yielded within 1% of PM 2156 RR and yielded 2.9% more than PM 2145 RR. However, the staple length and fiber strength advantage of PM 2266 RR is very significant over these other two early season RR varieties. PM 2266 RR has averaged 2 staple units longer than PM 2156 RR and 1.2 staple units longer than PM 2145 RR. Micronaire of PM 2266 RR has tended to be lower than PM 2156 RR and PM 2145 RR.

Southern High Plains Performance

Generally speaking, the tier of counties that include Lubbock county and all other Texas High Plains counties south of this area to Gaines and Dawson counties is considered the Southern cotton growing region of the Texas High Plains. Table 6 shows lint yield and fiber parameters for four D&PL stripper-type RR varieties. All of these trials were conducted in the Southern High Plains area described above. Fourteen total trials were conducted in 2000 and 2001 that included PM 2266 RR, PM 2379 RR, PM 2326 RR, and PM 2200 RR. PM 2266 RR had the highest average yield and longest average staple length of the varieties in the comparison.

Northern High Plains Performance

The Northern High Plains cotton producing area of the Texas High Plains are the tier of counties that include Hale, Bailey, Lamb and Floyd and all other counties North. Table 7 illustrates yield and fiber quality characteristics of the same four D&PL stripper RR varieties compared in the Northern cotton growing region of the Texas High Plains. PM 2266 RR had the highest average lint yield and the lowest micronaire value of the four varieties. Staple length was just slightly shorter than the variety with the longest staple value, PM 2200 RR. Fiber strength, uniformity and turnout were very similar among the 4 varieties grown in the Northern areas.

Summary

PM 2266 RR is a medium-maturing, high-yielding variety that is well-adapted to all regions of the stripper harvested areas of the Texas High Plains. It has good fiber length, strength, and uniformity, and often has lower micronaire values when compared to PM 2326 RR, PM 2379 RR, and PM 2156 RR. The semi-smooth leaf characteristic and good storm-proofness also help this variety to be widely adapted. Consistent higher yield performance across years and environments, when compared to PM 2326 RR and PM 2200 RR, combined with its good staple length make PM 2266 RR a variety that has the potential to improve a growers “bottom line”. Supplies of PM 2266 RR seed are expected to be limited for the 2002 season.

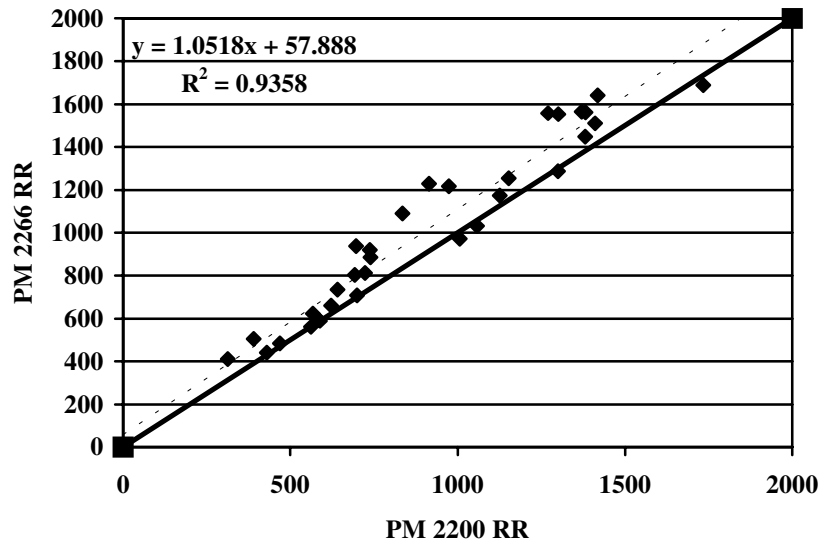
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Table 1. Characteristics of PM 2266 RR.

Characteristic	Description or Rating
Maturity	Early to Mid Maturity
Plant Height	Medium
Leaf Pubescence	Semi-Smooth
Range of Seed Size (#/lb.)	4,000-4,350
Storm Resistance	Very Good
<i>Fusarium</i> Resistance	Good
<i>Verticillium</i> Resistance	Good
Bacterial Blight	Susceptible
Node of 1 st Fruiting Branch	6.1

Table 2. Means of lint yield and fiber quality parameters for PM 2266 RR. Data are means of D&PL ASTs, D&PL Research trials and Texas A&M OVTs (32 trials total) as of December 19, 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	1014	32.1	34.4	4.1	28.8	82.3
PM 2326 RR	998	32.6	34.1	4.4	28.9	82.8
PM 2200 RR	909	31.4	34.5	4.1	28.3	82.0



Graph 1. Lint yield scattergram for PM 2266 RR compared to PM 2200 RR. Data represents the same 32 trials shown in Table 1.

Table 3. Lint yield and fiber quality means from 19 trials conducted in 2000.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	892	29.8	34.0	3.7	28.6	81.8
PM 2326 RR	889	30.3	33.9	4.0	28.6	82.5
PM 2200 RR	804	28.8	34.1	3.7	27.7	81.6

Table 4. Lint yield and fiber quality means from 13 trials conducted in 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	1193	35.5	34.9	4.7	29.0	82.9
PM 2326 RR	1158	35.9	34.5	5.0	29.4	83.2
PM 2200 RR	1063	35.1	35.2	4.7	29.0	82.6

Table 5. Lint yield and fiber quality means from 12 trials conducted in 2000 and 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	983	29.8	34.1	4.0	28.4	82.2
PM 2156 RR	992	31.1	32.1	4.2	25.4	81.5
PM 2145 RR	955	31.0	32.9	4.2	27.2	81.6

Table 6. Lint yield and fiber quality means from 14 trials conducted in the Southern High Plains in 2000 and 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	1020	31.9	34.7	4.1	29.1	82.6
PM 2379 RR	1019	32.8	33.1	4.5	29.3	82.3
PM 2326 RR	987	32.5	34.4	4.4	29.4	83.1
PM 2200 RR	927	31.3	34.6	4.0	28.8	82.0

Table 7. Lint yield and fiber quality means from 14 trials conducted in the Northern High Plains in 2000 and 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2266 RR	1003	32.6	34.2	4.2	28.4	82.0
PM 2326 RR	993	33.0	34.0	4.6	28.9	82.6
PM 2379 RR	964	33.0	33.5	4.5	28.9	82.5
PM 2200 RR	890	31.9	34.6	4.3	28.1	82.0