2002 BELTWIDE COTTON CONFERENCES, ATLANTA, GA – JANUARY 8-12

PM 2167 RR, A NEW EARLY-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, early-maturing stripper variety that possesses Roundup Ready® (RR) technology. PM 2167 RR represents novel germplasm to the Texas High Plains cotton producing region. PM 2167 RR was developed at Delta and Pine Land's breeding facilities in Aiken, TX and Hale Center, TX by Dr. Richard Sheetz. Numerous years of testing has shown that PM 2167 RR is well-adapted to the Texas High Plains. Delta and Pine Land data shows that PM 2167 RR has produced more lint yield per acre than PM 2156 RR, PM 2326 RR and PM 2200 RR. Seed supplies of PM 2167 RR are expected to be good for the 2002 growing season. PM 2167 RR is more stormproof than PM 2156 RR and PM 2167 RR is moderately resistant to Bacterial Blight.

Introduction

New, diverse germplasm is the life blood of breeding operations. PM 2167 RR represents novel germplasm for the Texas High Plains. In 1997, Paymaster launched the first two Roundup Ready stripper-type varieties; PM 2326 RR and PM 2200 RR. PM 2167 RR, along with other new variety introductions in 2002, represents a second generation of transgenic varieties available to growers in the Texas High Plains. This new variety is a high yielding, early-maturing variety with fiber qualities similar to PM 2156 RR and PM 2145 RR. In terms of maturity, it is most similar to PM 2156 RR. Its intended market of adaptation will be the Northern High Plains cotton growing regions of Texas and a potential early-maturing variety for late season re-plant situations. Yield data from 2000 and 2001 have shown PM 2167 RR produces more lint per acre than PM 2156 RR, PM 2145 RR, PM 2326 RR and PM 2200 RR. Trial data suggests that PM 2167 RR will be a replacement variety for PM 2156 RR and that it has a competitive advantage over PM 2145 RR in many areas due to its higher yield. Fiber strength has averaged approximately 1 gram per tex stronger than PM 2156 RR over the last two years.

This new variety has a cluster fruiting characteristic, semi-smooth leaf and similar plant height to PM 2156 RR and PM 2145 RR. PM 2167 RR is much more stormproof than PM 2156 RR. PM 2167 RR is moderately resistant to Bacterial Blight, whereas PM 2156 RR and PM 2145 RR are susceptible to Bacterial Blight. Yield consistency or stability has shown to be excellent for PM 2167 RR.

Materials and Methods

The parent material for PM 2167 RR was a line selected from a cross of breeding line 107872 x 466*303 made in 1984. A line derived from selecting in the subsequent segregating populations of this cross was given the experimental designation of PMX 126514 in 1992. Breeding lines for PM 2167 RR were developed from a cross of PMX 126514 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 2167 RR was tested as PMX 00V05RR in 2000 and tested as PM 2167 RR in 2001. Seed supply of PM 2167 RR is expected to be good for the 2002 growing season.

Data reported herein are from either 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 2167 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. Although yield performance has been very good in both the Northern and Southern cotton growing regions of the Texas High Plains, its relatively short staple length (average 32.6 staple) and its determinancy, PM 2167 RR's area of acceptance may be confined to the Northern areas of the Texas High Plains. Yield data averaged across 22 trials in 2000 and 2001 shows PM 2167 RR outyielded PM 2156 RR, PM 2326 RR and PM 2200 RR by 3.4%, 6.7%, and 16.1%, respectively. PM 2326 RR, PM 2200 RR and PM 2156 RR,

were used as comparison varieties because combined, they represent over 90% of the stripper-type RR varieties grown on the Texas High Plains (Source: USDA-AMS). Other characteristics averaged across these 22 trials show the following: turnout was 35.8 %, staple averaged 32.6, micronaire 4.6, strength 27.2, and uniformity averaged 81.8 for PM 2167 RR (Table 2).

Performance Versus Other Early Season RR Varieties

Table 2 demonstrates how PM 2167 RR can outyield even the more indeterminate stripper-type RR varieties, i.e. PM 2326 RR and PM 2200 RR. However, the most logical comparisons to make with PM 2167 RR are against PM 2156 RR and PM 2145 RR since these two varieties currently represent the commercially available, early-maturing RR varieties. Table 3 illustrates lint yield performance and fiber quality parameters from 13 trials conducted in 2000 and 2001. PM 2167 RR produced 3.2% and 7.0% more pounds per acre than PM 2156 RR and PM 2145 RR, respectively. PM 2167 RR's staple length was slightly longer than PM 2156 RR and fiber strength was stronger than PM 2156 RR.

Performance Versus Targeted Replacement Variety

Twenty-six comparisons were available, specifically matching yield performance between PM 2167 RR and PM 2156 RR (the variety PM 2167 RR is slated to replace). Similar percent yield increases still hold true for the more in-depth look at performance of these two varieties (Table 4). PM 2167 RR, in this comparison, outyields PM 2156 RR by 2.8%, averages about one-half staple length longer and is over 1 gram per tex stronger than PM 2156 RR.

Summary

PM 2167 RR is an early-maturing, high-yielding variety that has performed well in many regions of the stripper harvested areas of the Texas High Plains. However, its particular area of adaptation will mainly be the Northern cotton growing regions of the High Plains. It has excellent yield and slightly longer and stronger fiber length than PM 2156 RR. The semi-smooth leaf characteristic may help to protect early season squares against flea hoppers and plant bugs that have shown to be a problem over the last couple of years. Very good storm-proofness and moderate resistance to Bacterial Blight also help this variety to be adapted to the Northern areas. Based on the past two years trial data, PM 2167 RR has had consistent higher yield performance across years and environments compared to PM 2326 RR, PM 2156 RR and PM 2200 RR. Supplies of PM 2167 RR seed are expected to be adequate for the 2002 season.

References

USDA-AMS. 2001. Cotton Varieties Planted, 2001 Crop. USDA-AMS Cotton Program, Memphis, TN.

Table 1. Characteristics of PM 2167 RR.

Characteristic	Description or Rating
Maturity	Early Maturity
Plant Height	Medium
Leaf Pubescence	Semi-Smooth
Range of Seed Size (#/lb.)	4,550-4,850
Storm Resistance	Very Good
Fusarium Resistance	Very Good
Verticillium Resistance	Good
Bacterial Blight	Moderately Resistant
Node of 1st Fruiting Branch	6.3

Table 2. Means of lint yield and fiber quality parameters for PM 2167 RR. Data are means of D&PL ASTs, D&PL Research trials and Texas A&M OVTs (22 trials total) as of December 19, 2001.

Variety	Lint Yield	Turnout %	Staple	Micronaire	Strength	Uniformity
PM 2167 RR	1170	35.8	32.6	4.6	27.2	81.8
PM 2156 RR	1132	35.1	32.2	4.5	25.8	82.0
PM 2326 RR	1097	34.3	34.3	4.6	29.2	83.2
PM 2200 RR	1008	33.3	34.6	4.3	28.4	82.3

Table 3. Mean lint yields and fiber qualities from 13 trials conducted in 2000 and 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2167 RR	979	31.8	32.2	4.4	26.4	81.1
PM 2156 RR	949	31.4	32.1	4.3	25.5	81.4
PM 2145 RR	915	31.4	32.8	4.2	27.3	81.5

Table 4. Mean lint yields and fiber qualities from 26 trials conducted in 2000 and 2001.

Variety	Lint Yield	Turnout%	Staple	Micronaire	Strength	Uniformity
PM 2167 RR	1151	35.3	32.5	4.6	27.0	81.9
PM 2156 RR	1120	34.4	32.1	4.5	25.6	81.9