#### DELTAPINE<sup>®</sup> NEW CLASS OF 13 PIMA GENUITY<sup>®</sup> ROUNDUP READY<sup>®</sup> FLEX VARIETY: DP 358 RF PIMA David W. Albara

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## <u>Abstract</u>

DP 358 RF Pima is a Genuity<sup>®</sup> Roundup Ready<sup>®</sup> Flex Pima variety. This mid to full maturing Pima variety has potential for excellent lint yield, fiber quality and fusarium resistance (Race 4) that will be released for commercial sales in the 2013 growing season. This variety has a hairy leaf pubescence with medium-tall to tall plant height. Average fiber properties of DP 358 RF Pima include fiber length of 1.44 inches, 4.2 micronaire, 42.8 g/tex fiber strength and 88.1 percent uniformity. The average turnout of DP 358 RF Pima is 38.0 percent and is resistant to Fusarium Race 4.

### **Introduction**

In 2013, Deltapine<sup>®</sup> brand is releasing for commercial introduction, a new mid to full maturing variety. The characteristics describing DP 358 RF Pima are summarized in Table 1. The highlights of the Pima cotton variety DP 358 RF Pima are outstanding yield potential with a maturity which makes it a great fit for Pima cotton grown in California/Arizona. DP 358 RF Pima has excellent fiber quality when compared to similar Pima varieties of Deltapine brand products and competitive check varieties.

Trait	DP 358 RF Pima
Maturity	Mid to Full
Leaf Pubescence	Hairy
Plant Height	Med-Tall toTall
Micronaire	4.2
Length	1.44 inches
Strength	42.8 g/tex
Uniformity	88.1%
Lint Percent	38.0%
Fusarium (Race 4)	Resistant

Table 1. DP 358 RF Pima Characteristics and Fiber Quality

## **Materials and Methods**

The data describing DP 358 RF Pima (along with internal and competitive check varieties) was obtained from the following sources: O&A Enterprises breeder trials, Monsanto on-farm trials, and University trials. Plant growth, fruiting, and maturity comparisons were made by plant mapping a subset of the Deltapine brand on-farm trials when approximately 50% of the bolls were open. All available yield, fiber quality, and plant mapping data were queried on the dates noted in each data table for these analyses.

# **Results and Discussion**

### **Fusarium Race 4 Comparisons**

In Fusarium oxysporum f.sp. vasinfectum (FOV) Race 4 trials conducted by O&AEnterprises (O&A), cotton plants were exposed to FOV Race 4 under filed conditions. Deltapine<sup>®</sup> variety DP 358 RF Pima had 99 percent survivability after two months of plant evaluation. The survivability of DP 358 RF Pima was higher than PHY 802 RF, DP 360 Pima, and DP 340 Pima (susceptible check).

Table 2. FOV Race 4 Testing Trials, Number of Emerged Plants and Percent Survivability with Comparisons of DP 358 RF Pima, PHY 802 RF, DP 360 Pima, and DP 340 Pima from California data (2012).

	# of Plants	# of Plants	# of Plants						
	05/15/12	06/10/12	07/15/12	Survivability					
DP 358 RF Pima	171	169	170	99%					
PHY 802 RF	196	170	187	95%					
DP 360 Pima	139	130	127	91%					
DP 340 Pima	581	279	172	30%					
*2012 O&A Enterpris	*2012 O&A Enterprises, California FOV-4 Trial								

DP 358 RF Pima was compared to PHY 800, DP 360 Pima, and PHY 802 RF in FOV Race 4 comparisons conducted by the University of California in 2011-2012. DP 358 RF Pima had reduced average root vascular staining in a two-year average when compared to PHY 800 and DP 360 Pima. Also in the two-year study DP 358 RF Pima had higher plant survivability when compared to PHY 800.

Table 2. FOV Race 4 Comparisons, with Average Root Vascular Staining and Percent Plant Survival Comparisons of DP 358 RF Pima, PHY 800, DP 360 Pima, and PHY 802 RF from University of California and USDA-ARS data (2012).

	Average Root Vascular			Percent Plant Survival				
	Staining		2011	2012	2 vr			
	-011		average	-011		average		
DP 358 RF Pima	0.87	0.87	0.87	89.90	83.30	86.58		
PHY 800	1.13	1.13	1.13	87.60	81.80	84.69		
DP 360 Pima	1.20	0.67	0.93	96.10	93.10	94.62		
PHY 802 RF	0.80	0.73	0.77	92.00	92.00	92.32		
Sources: University of California and USDA-ARS FOV Race 4 Screenings						enings		
(TULARE Countysite	- 2012)							

## DP 358 RF Pima Yield, Fiber Quality and Value Comparisons

In University of California comparisons of Pima cotton varieties, DP 358 RF Pima was compared to DP 340 Pima, DP 360 Pima, PHY 800, and PHY 805RF. In testing, DP 358 RF Pima had higher lint yield when compared to DP 360 Pima and similar lint yield when compared to PHY 800.

Variety	Seed Cotton	Lint	%	Lint Yield	Lint Yield			
	(lbs/A)	%	Turnout	(lbs lint/A)	(% of PHY 800)			
DP 358 RF Pima	5300	37.6	32.7	1733	100			
DP 340 Pima	5347	37.9	33.3	1782	103			
DP 360 Pima	5027	38.1	33.5	1686	97			
PHY 800	5218	37.8	33.3	1737	100			
PHY 805 RF	5162	39.5	34.8	1794	103			
MEAN	5211	38.2	33.5	1746				
LSD (0.05)	247	0.6	0.8	90				
%CV	3.3	1.1	1.6	3.5				
Monsanto Pima stra	Monsanto Pima strains trial – 40-inch rows. University of California 2011.							

Table 2. University of California Yield Comparisons of DP 358 RF Pima, DP 340 Pima, DP 360 Pima, PHY 800, and PHY 802 RF (University of California 2011).

The improvements in DP 358 RF Pima over DP 340 Pima, DP 360 Pima, PHY 800, and PHY 805 RF, in testing conducted by the University of California were lower micronaire, increased fiber length, increased fiber strength over DP 340 Pima and DP 360 Pima, and increased leaf grade over other varieties compared.

Table 2. University of California Fiber Quality Comparisons of DP 358 RF Pima, DP 340 Pima, DP 360 Pima, PHY 800, and PHY 805 RF from University of California data (2011).

Variety	Micronaire	Length	Strength	Uniformity	Leaf	HVI	HVI
		(inches)	(g/tex)	Index	Grade	Color	Trash
DP 358 RF Pima	3.68	1.46	44.1	86.6	2.75	1.00	0.63
DP 340 Pima	4.08	1.43	40.3	87.2	2.25	1.00	0.43
DP 360 Pima	3.88	1.42	41.2	86.5	2.50	1.25	0.55
PHY 800	3.75	1.44	45.0	87.4	2.30	1.02	0.46
PHY 805 RF	3.86	1.45	45.8	86.7	2.08	1.02	0.42
MEAN	3.85	1.44	43.3	86.9	2.38	1.06	0.50
LSD (0.05)	0.19	0.03	2.0	0.8	0.74	NS	
LSD (0.10)							0.19
Monsanto Pima stra	ains tria <mark>l – 40</mark> in	ich rows. U	J <b>niversity o</b> f	f California 20	11.		

In a three year yield comparison of DP 358 RF Pima to DP 340 Pima, DP 358 RF Pima yielded more bales per acre in 2010 when compared to DP 340 Pima. The two varieties had similar boll size (g/boll) in a three-year average.

Table 2. Three-yea	ar Yield and	l Boll Size	Comparison	of DP	358 RF	Pima a	nd DP	340 Pima	(2010 to	2012	O&A
Enterprises Califor	mia Breeder	Trials).									

Yield (bales/acre)	2010	2011	2012	3-Year
	Average	Average	Average	Average
DP 358 RF Pima	2.75	2.17	2.68	2.53
DP 340 Pima	2.71	2.71	3.17	2.86
% Lint	2010	2011	2012	3-Year
	Average	Average	Average	Average
DP 358 RF Pima	37.7	39.1	37.2	38.0
DP 340 Pima	37.0	40.7	40.0	39.2
Boll Size (g/boll)	2010	2011	2012	3-Year
	Average	Average	Average	Average
DP 358 RF Pima	3.23	3.39	3.40	3.34
DP 340 Pima	3.29	3.70	3.63	3.54

In review of four years of fiber quality data DP 358 RF Pima was compared to DP 340 Pima and DP 360 Pima (2009 only). In 2009, DP 358 RF Pima had lower micronaire when compared to DP 340 Pima and DP 360 Pima and increased fiber length and fiber strength. In 2010, 2011, and 2012 testing, DP 358 RF Pima had increased fiber length, uniformity, and fiber strength when compared to DP 340 Pima. The four-year average shows DP 358 RF Pima having an increased reduced micronaire (decrease of 0.33), increase in fiber length (increase of 0.06), increased uniformity index (increase of 1.1) and increase in fiber strength ( increase of 2.9) when compared to DP 340 Pima.

1	Table 2.	Four	Years	of Fiber	Data	Comparing	, DP	358	RF	Pima	and	DP	340	Pima	and	DP	360	Pima	(2009	only)
1	(2009 to	2012	O&A	West Side	, Cali	ifornia Bree	eder	Trials	s).											• •

2009 Fiber	Micronaire	Maturity	Length	Uniformity	Strength
			(inches)	Index	(g/tex)
DP 358 RF Pima	3.71	0.86	1.452	86.9	42.1
DP 340 Pima	4.37	0.88	1.414	87.9	40.4
DP 360 Pima	4.01	0.87	1.413	86.8	40.2
2010 Fiber	Micronaire	Maturity	Length	Uniformity	Strength
			(inches)	Index	(g/tex)
DP 358 RF Pima	4.51	0.88	1.442	88.8	43.2
DP 340 Pima	4.79	0.88	1.373	88.2	41.4
2011 Fiber	Micronaire	Maturity	Length	Uniformity	Strength
			(inches)	Index	(g/tex)
DP 358 RF Pima	4.42	0.89	1.422	88.5	42.4
DP 340 Pima	4.60	0.90	1.381	86.8	38.0
2012 Fiber	Micronaire	Maturity	Length	Uniformity	Strength
			(inches)	Index	(g/tex)
DP 358 RF Pima	4.17	0.85	1.444	88.0	43.6
DP 340 Pima	4.35	0.86	1.360	85.0	39.6
4-Year Average	Micronaire	Maturity	Length	Uniformity	Strength
			(inches)	Index	(g/tex)
DP 358 RF Pima	4.20*	0.87	1.440*	88.1*	42.8*
DP 340 Pima	4.53	0.88	1.382	87.0	39.9

In an on-farm trial conducted at Borba Farms in 2012, DP 358 RF Pima produced 227 lbs lint more per acre than the competitor product PHY 802 RF. Fiber quality characteristics for staple, micronaire, strength, and uniformity index were similar for both products.

Table 3. On-Farm Performance of Lint Yield, Staple, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 358 RF Pima and PHY 802 RF at Borba Farms, 2012.

Variety	DP 358 RF Pima	PHY 802 RF
Lint Yield (lb/acre)	1829	1602
Staple	46.2	47.0
Micronaire	3.8	3.7
Strength (g/tex)	44.3	44.5
Uniformity Index (%)	85.2	85.2
N (bales)	18	16

### <u>Summary</u>

DP 358 RF Pima is a mid to full maturing variety ideal for production in California/Arizona environments. In testing, DP 358 RF Pima has shown excellent FOV Race 4 resistance when compared to other Pima cotton varieties on the market. DP 358 RF Pima has similar performance to DP 340 Pima and in pre-commercial trials DP 358 RF Pima has shown improved fiber quality.

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