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PHY 710 R ACALA AND PHY 810 R PIMA: NEW ROUNDUP READY® VARIETIES FROM PHYTOGEN

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Abstract

Phytogen Seed Co. LLC has introduced two new Roundup Ready® varieties that exhibit high yield potential in the San Joaquin Valley, CA. PHY 710 R Acala is a Roundup Ready® conversion of PHY 78 Acala, while PHY 810 R Pima is a Roundup Ready® conversion of PSC 57 Pima. PHY 710 R Acala and PHY 810 R Pima were developed by the Phytogen Seed Co. breeding program at Corcoran, CA. The key objectives were to develop Roundup Ready® varieties which would capture the full-season potential of the San Joaquin Valley coupled with consistent high yield potential and fiber quality. Field testing was conducted over two years (2003 – 2004) by Phytogen Seed Company, Corcoran, CA. PHY 710 R Acala yielded significantly more than Acala Maxxa and was comparable to the recurrent parent, PHY 78 Acala, indicating it to be a faithful conversion of the recurrent parent. PHY 710 R Acala has fiber quality equal to PHY 78 Acala and is improved in both uniformity and elongation as compared to Acala Maxxa, the San Joaquin Valley Cotton Board (SJVCB) Acala variety standard. PHY 810 R Pima yields were significantly higher than Pima S-7 and the recurrent parent PSC 57 Pima (a yield advantage of 7.9%). PHY 810 R Pima will have a fit in specific growing areas and soil types in the San Joaquin Valley, CA where PSC 57 Pima has been a consistent yielder, and in those locations where growers desire a Pima variety with tolerance to glyphosate. PHY 810 R Pima has very good fiber qualities comparable to the recurrent parent PSC 57 Pima and Pima S-7, with significant improvements in fiber strength T1 compared to Pima S-7, the San Joaquin Valley Cotton Board (SJVCB) Pima variety standard.

Introduction

The cotton growing industry has experienced major advances in production practices, exemplified in part by the advent of new production tools such as Roundup Ready® technology for weed control. However, advancements in germplasm development have also made a significant contribution to improving yields valley wide. PHY 78 Acala and PSC 57 Pima both represent varieties that have delivered significant performance versus the SJV standards. PHY 710 R Acala and PHY 810 R Pima are new Roundup Ready® conversions of PHY 78 Acala and PSC 57 Pima, respectively, by Phytogen Seed Company, LLC. They have been widely tested over a wide range of soil types from sandy loam to heavy clay loams, and heat unit accumulations differing as much as 300 H.U. This paper presents results on measurements of yield performance and fiber quality for Phytogen Seed Company's new Roundup Ready® varieties PHY 710 R Acala and PHY 810 R Pima. Furthermore, PHY 810 R Pima is the only commercially available Roundup Ready® Pima in the U.S.

Materials and Methods

PHY 710 R Acala was evaluated in Phytogen Acala Advanced Strains trials in comparison to PHY 78 Acala, recurrent parent to PHY 710 R Acala, and Acala Maxxa, the San Joaquin Valley Cotton Board (SJVCB) standard Acala variety for fiber quality. In addition, PHY 710 R Acala was evaluated in Phytogen Acala Roundup Ready® trials in 2003 and 2004. Trials were randomized complete block designs with four replications. Yield and fiber quality data were collected. Fiber properties were evaluated on individual instruments at Starlab.

PHY 810 R Pima was evaluated in Phytogen Pima Roundup Ready® trials in 2003. Comparisons were made to PSC 57 Pima, the recurrent parent to PHY 810 R Pima, and Pima S-7, the San Joaquin Valley Cotton Board (SJVCB)

standard Pima variety for fiber quality. In addition, PHY 810 R Pima was evaluated in Phytogen Pima Advanced Strains trials in 2004 with comparisons to Pima S-7. Trials were randomized complete block designs with four replications. Yield and fiber quality data were collected. Fiber properties were evaluated on individual instruments at Starlab and ITC.

Results and Discussion

PHY 710 R Acala:

Phytogen Acala Advanced Strains Trial (AST) results are shown in Figure A1 (2004), representing 5 test locations in the San Joaquin Valley of California. PHY 710 R Acala and PHY 78 Acala yields were significantly higher than Acala Maxxa. It is shown that PHY 710 R Acala captures the high yield potential and fiber quality of its recurrent parent, PHY 78 Acala, indicating that PHY 710 R Acala is a faithful conversion of the recurrent parent. Phytogen Acala Roundup Ready® Trial results are shown in Figure A2 (2003 – 2004), representing 9 test locations in the San Joaquin Valley of California. PHY 710 R Acala yields were significantly higher than those of Acala Maxxa.

Fiber quality results by individual instruments are shown in Table A1. PHY 710 R Acala exhibited fiber qualities significantly improved in uniformity ratio and elongation compared to Acala Maxxa. Again, PHY 710 R Acala is seen to be an excellent conversion of PHY 78 Acala.

PHY 810 R Pima:

Phytogen Pima Roundup Ready® Trial results are shown in Figure P1 (2003), representing 4 test locations in the San Joaquin Valley of California with comparisons to PSC 57 Pima, recurrent parent to PHY 810 R Pima, and the standard Pima S-7. PHY 810 R Pima yields were consistent and significantly higher than those of Pima S-7. PHY 810 R Pima yield over four locations of testing was significantly higher than the recurrent parent PSC 57 Pima with a yield advantage of 7.9%. Phytogen Pima Advanced Strains Trial (AST) results are shown in Figure P2 (2004), representing 4 test locations. Over locations analysis demonstrates PHY 810 R Pima yields to be significantly higher than Pima S-7.

Fiber quality results by individual instruments are shown in Table P1. PHY 810 R Pima exhibited very good fiber qualities comparable to the SJV fiber quality standard Pima S-7, with a significant improvement in fiber strength T1). Again, PHY 810 R Pima is seen to be a faithful conversion of its recurrent parent, PSC 57 Pima. Data shows that PHY 810 R Pima has excellent productivity San Joaquin Valley, CA and will contribute a major impact in the Pima industry by offering Pima growers the opportunity of utilizing glyphosate in their weed control programs.

Summary

PHY 710 R Acala, a new Roundup Ready® Acala variety from Phytogen, has shown a significant yield advantage over Acala Maxxa and delivers significant improvements in fiber uniformity and elongation over the SJV quality standard Acala Maxxa.

PHY 810 R Pima has shown impressive yield advantages over Pima S-7 as well as its recurrent parent, PSC 57 Pima. Like its recurrent parent PSC 57 Pima, PHY 810 R Pima has very good fiber quality and offers a significant improvement in fiber strength T1 over Pima S-7.

PHY 710 R Acala is a mid-maturity Acala variety while PHY 810 R Pima is a full-maturity Pima variety, both developed to capture the full season yield potential of the San Joaquin Valley growing region while delivering Roundup Ready® technology in varieties with excellent fiber quality.

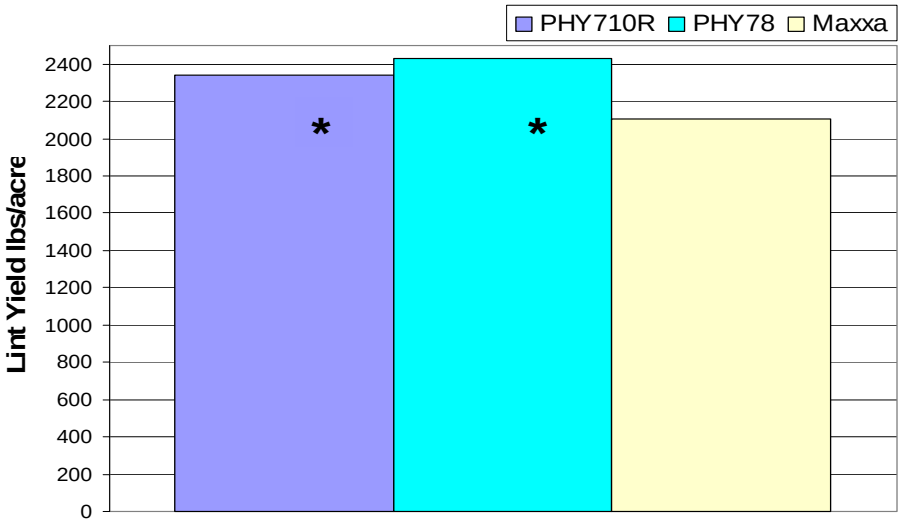

Figure A1. Phytogen Acala Advanced Strains Trials, 2004 (Over 5 loc.)

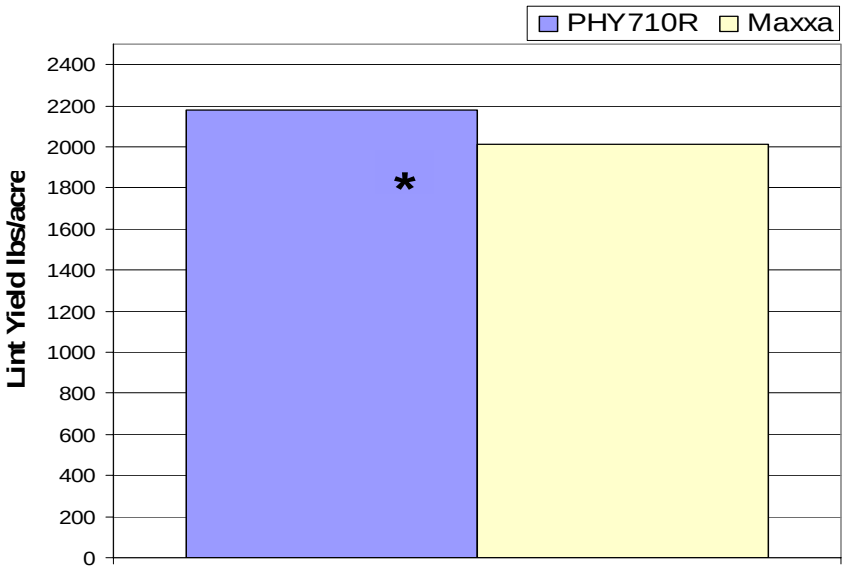

Figure A2. Phytogen Acala Roundup Ready® Trials, 2003 – 2004 (Over 9 loc.)

Table A1. Fiber Quality Traits (Individual Instruments, 5 Locations, 2003)

	PHY 710 R	**Maxxa**
2.5% Span Length	1.17 *	1.21
Uniformity Ratio	51.7 *	50.6
Strength T1 (g/tex)	25.2	24.8
Elongation	10.9 **	7.2
Micronaire	4.53	4.58

*,** Indicates a significant LSD value at alpha = .05 and .01, respectively.

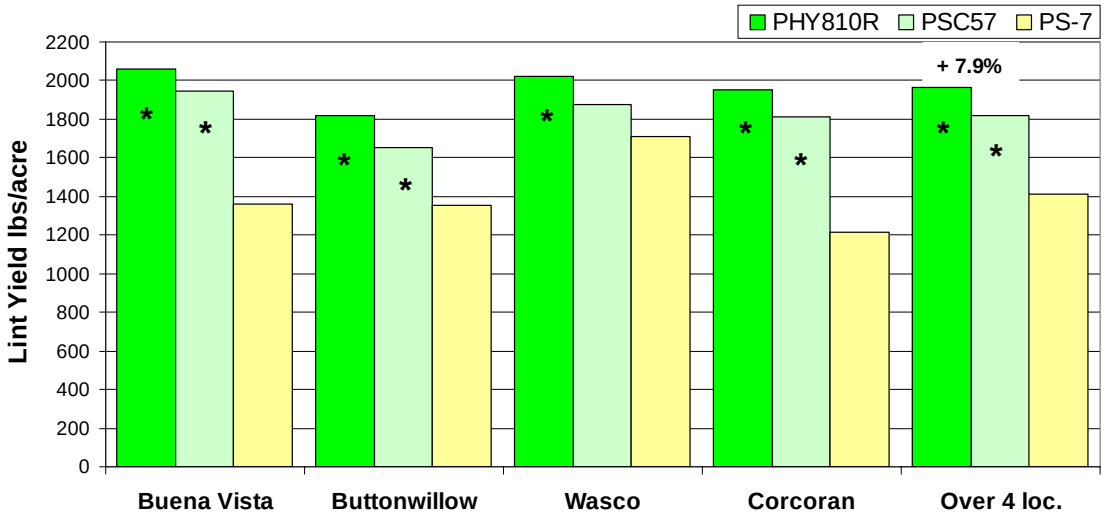

Figure P1. Phytogen Pima Roundup Ready® Trials, 2003 (Over 4 loc)

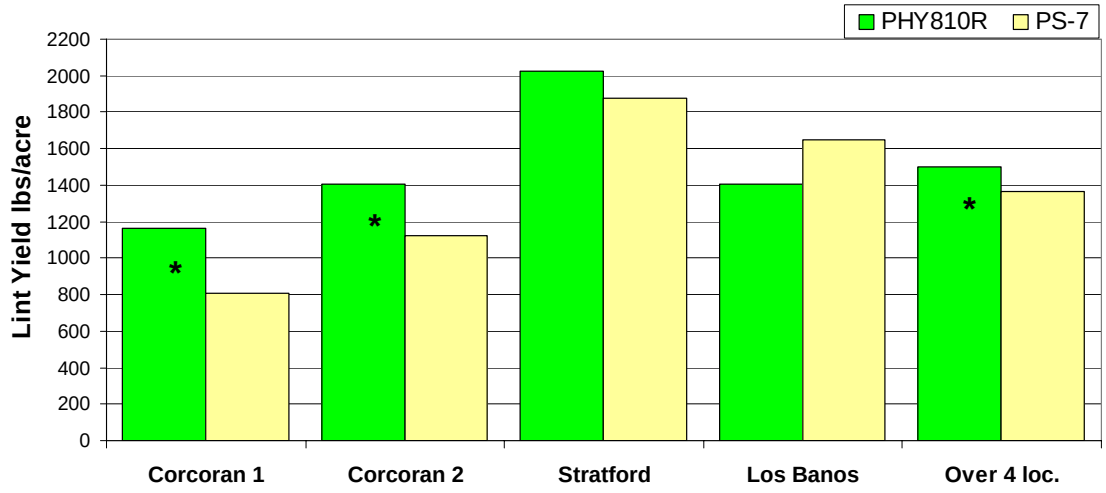

Figure P2. Phytogen Pima Advanced Strains Trials, 2004 (Over 4 loc)

Table P1. Fiber Quality Traits (Individual Instruments, 4 Locations, 2003)

	PHY 810 R	PSC 57	Pima S-7
2.5% Span Length	1.43	1.43	1.41
Uniformity Ratio	51.8	51.9	52.2
Strength T1 (g/tex)	34.5 *	35.9 *	33.2
Elongation	8.1	7.9	7.8
Micronaire	4.33	4.22	4.27

* Indicates a significant LSD value at alpha = .05.