

PHYTOGEN 33 ACALA, A NEW HIGH YIELDING COTTON FOR THE SAN JOAQUIN VALLEY

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Abstract

Phytogen 33 Acala is a new, high yielding cotton variety for California's San Joaquin Valley. Over three years of testing by the San Joaquin Valley Cotton Board, Phytogen 33 yields were equal to those of Maxxa (the SJVCB standard cotton variety). Over four years of testing by J. G. Boswell Cottonseed Breeding, Phytogen 33 yields were higher than those of Maxxa by sixty pounds of lint per acre. In trials conducted by the University of California Cooperative Extension in 1996, Phytogen 33 yielded 102 percent of Maxxa across locations. Phytogen 33 fiber properties were superior to those of Maxxa and its spinning properties were excellent. Phytogen 33 planting seed will be readily available in 1997.

Introduction

Phytogen 33 Acala is a new cotton variety, developed for California's San Joaquin Valley by J. G. Boswell Cottonseed Breeding. It was approved for commercial release by the San Joaquin Valley Cotton Board in March, 1996.

Phytogen 33 was originally selected from USDA release 6-023, a bulk of individual plant selections from an F2 population of the cross (ATE-11 x NM49-2) x (C6TE x NMB3080). To introduce Phytogen 33, results of yield and fiber quality comparisons will be discussed.

Materials and Methods

Prior to release, Phytogen 33 was evaluated as PHY33 by the San Joaquin Valley Cotton Board (SJVCB). Three trials were conducted in 1993, ten in 1994, and eight in 1995. At each location, Phytogen 33 was compared to Maxxa, the SJVCB standard variety, in a randomized complete block design in four replications.

In independent testing by J. G. Boswell Cottonseed Breeding, twenty performance trails were conducted between 1993 and 1996. At each location, Phytogen 33 was compared to Maxxa in a randomized complete block design in four replications. Yield and fiber quality data were collected. Fiber properties were evaluated on individual instruments at the J. G. Boswell Cottonseed Breeding fiber laboratory. In addition, yarn and processing properties of

carded and combed Ne50's count yarns were determined for samples from six of these locations. These tests were performed at the International Textile Center in Lubbock, Texas.

Farm advisors from the University of California Cooperative Extension also conducted yield evaluations in 1996, comparing all cotton varieties approved for the San Joaquin Valley. These trials included Phytogen 33 and Maxxa which were evaluated in randomized complete block designs with four replications at eight locations.

Results and Discussion

Results of the 1993 SJVCB Screening Trials are shown in Figure 1 (Bassett, 1994). Phytogen 33 yields were higher than those of Maxxa at all locations.

Results of the 1994 SJVCB Variety Trials are shown in Figure 2 (Bassett, 1995). Phytogen 33 yields were higher than those of Maxxa at three out of eight locations.

Results of the 1994 SJVCB National Standards test are shown in Figure 3 (Bassett, 1995). Phytogen 33 yields were higher than those of Maxxa at one of the two trial sites as well as over locations.

Results of the 1995 SJVCB Variety Trials are shown in Figure 4 (Bassett, 1996). Phytogen 33 yields were higher than those of Maxxa at three out of eight locations as well as over locations.

An over years yield comparison of Phytogen 33 and Maxxa grown in all SJVCB trials from 1993 to 1995 is shown in Figure 5 (21 trials total). Phytogen 33 and Maxxa yields were virtually the same (1375 Lbs./Ac. and 1373 Lbs./Ac., respectively).

Results of J. G. Boswell Cottonseed Breeding's 1993 Advanced Strains Tests are shown in Figure 6. Phytogen 33 yields were higher than those of Maxxa at three out of four locations as well as over locations.

Results of J. G. Boswell Cottonseed Breeding's 1994 Advanced Strains Tests are shown in Figure 7. Phytogen 33 yields were higher than those of Maxxa at all locations.

Results of J. G. Boswell Cottonseed Breeding's 1995 Advanced Strains Tests are shown in Figure 8. Yields of Phytogen 33 were higher than Maxxa at three out of five locations as well as over locations.

Results of J. G. Boswell Cottonseed Breeding's 1996 Advanced Strains Tests are shown in Figure 9. Yields of Phytogen 33 were higher than Maxxa at all locations.

An over years yield comparison of Phytogen 33 and Maxxa grown in all J. G. Boswell Cottonseed Breeding trials from

1993 to 1996 is shown in Figure 10 (20 trials total). Yields of Phytogen 33 were higher than Maxxa by sixty pounds of lint per acre (1355 Lbs./Ac. and 1295 Lbs./Ac., respectively).

In Figure 11, results of the 1996 Farm Advisor's Approved Variety Trials are shown (Vargas et al, 1997). Yields of Phytogen 33 exceeded those of Maxxa at four of eight locations and over locations. Across all locations, Phytogen 33 yielded 102 percent of Maxxa.

Agronomic properties of Phytogen 33 and Maxxa are compared in Table 1. Phytogen 33 had a lower gin turnout than Maxxa but larger bolls. Phytogen 33 also had a higher seed index than Maxxa. Because of this, higher seeding rates have been necessary when planting Phytogen 33 in order to ensure adequate plant populations.

Fiber quality results are shown in Table 2. Phytogen 33 fiber was significantly longer than Maxxa, and had significantly higher uniformity, strength, elongation, and micronaire.

Spinning properties are shown in Table 3. Phytogen 33 generated lower manufacturing waste than Maxxa. Carded 50's yarns spun from Phytogen 33 showed higher elongation, similar skein break factor, better evenness, and had significantly fewer neps than carded 50's Maxxa yarns. Combed 50's yarns spun from Phytogen 33 showed improved elongation and significantly better evenness than combed 50's Maxxa yarns.

Management Recommendations

Phytogen 33 is a very vigorous variety and as such requires different management than Maxxa.

Pix should be applied whenever growth is excessive. Typically, Phytogen 33 will require about 1/4 pint more Pix per acre per application than Maxxa. Multiple applications may be necessary. On good soil, moisture stress combined with Pix may be necessary to control growth. Phytogen 33 should not be managed to look like Maxxa at the end of the season!

Phytogen 33 will require slightly more moisture stress than Maxxa (i.e. a few more days between irrigations). Excessive moisture stress should be avoided but growers should not irrigate when plants are "too green".

Phytogen 33 requires about the same amount of nitrogen as other cotton varieties. Growers should test petiole nitrate levels and act accordingly. Fertilizer should not be used to regulate plant growth.

Summary

Phytogen 33 is a vigorous variety that has yielded exceptionally well. It has exhibited excellent fiber and spinning properties. Phytogen 33 planting seed will be readily available in 1997.

References

Bassett, D. M. 1994. San Joaquin Valley Cotton Board, 1993 Season, Acala Screening and Variety Test Results.

Bassett, D. M. 1995. San Joaquin Valley Cotton Board, 1994 Season, Acala Screening and Variety Test Results.

Bassett, D. M. 1996. San Joaquin Valley Cotton Board, 1995 Season, Acala Screening and Variety Test Results.

Vargas, R., D. Munk, B. Roberts, B. Weir, S. Wright, M. Keeley, M. Jiminez, Jr., T. Martin-Duvall. 1997. California Cotton Review, 42: 2-3.

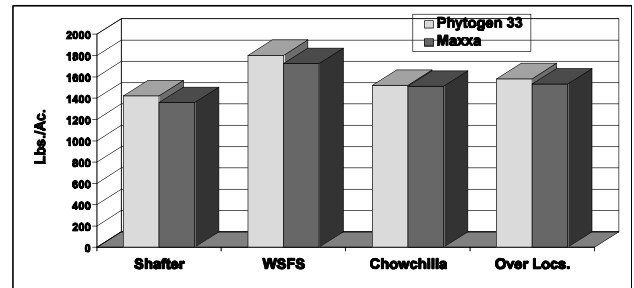


Figure 1. 1993 SJVCB Screening Trials.

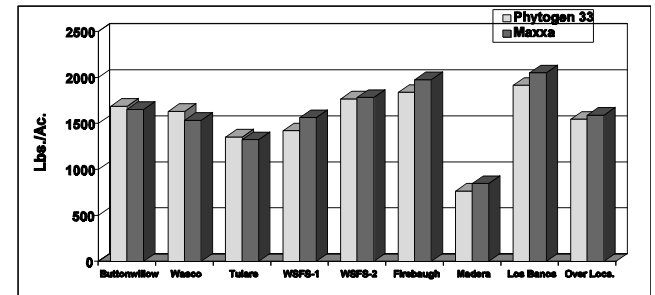


Figure 2. 1994 SJVCB Variety Trials.

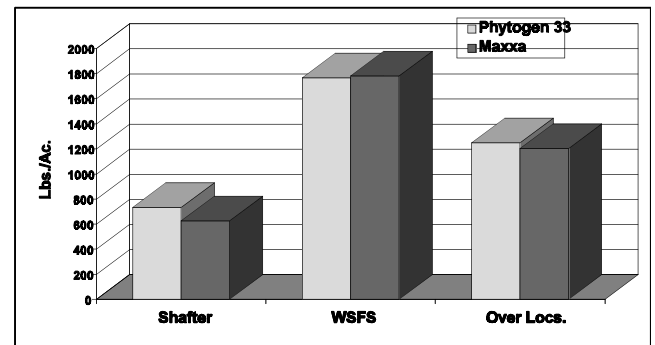


Figure 3. 1994 SJVCB National Standards Tests.

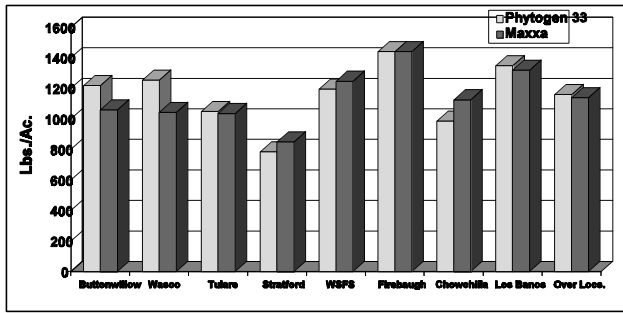


Figure 4. 1995 SJVCB Variety Trials.

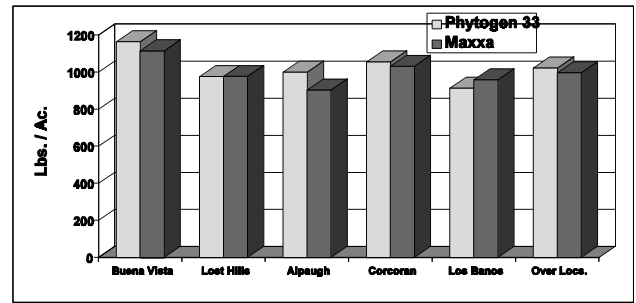


Figure 8. 1995 J. G. Boswell Cottonseed Breeding Advanced Strains Tests.

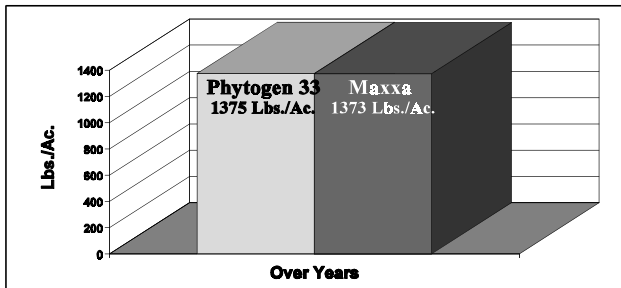


Figure 5. SJVCB over years yield comparison (21 trials, 1993-95)

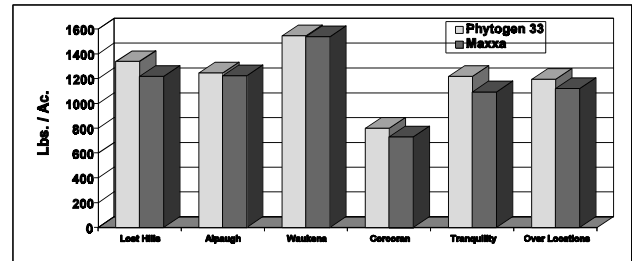


Figure 9. 1996 J. G. Boswell Cottonseed Breeding Advanced Strains Tests.

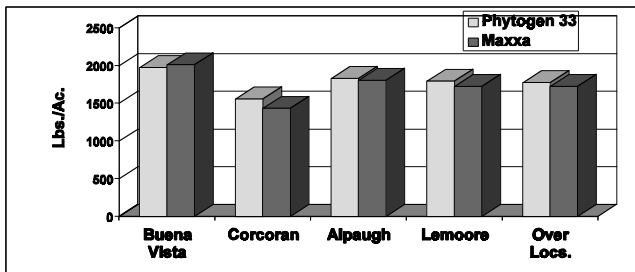


Figure 6. 1993 J. G. Boswell Cottonseed Breeding Advanced Strains Tests.

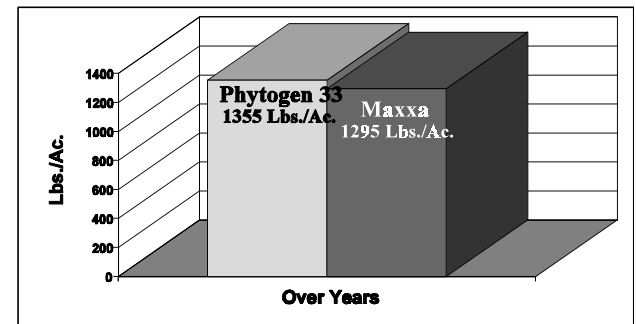


Figure 10. J. G. Boswell Cottonseed Breeding over years yield comparison (20 trials, 1993-96)

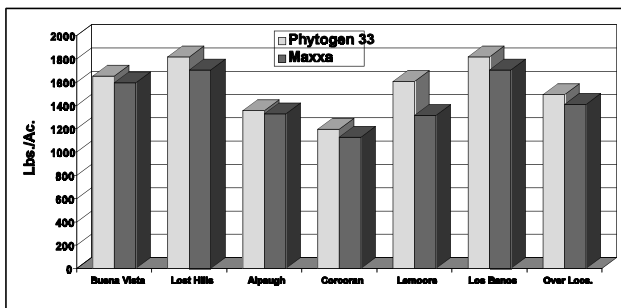


Figure 7. 1994 J. G. Boswell Cottonseed Breeding Advanced Strains Tests.

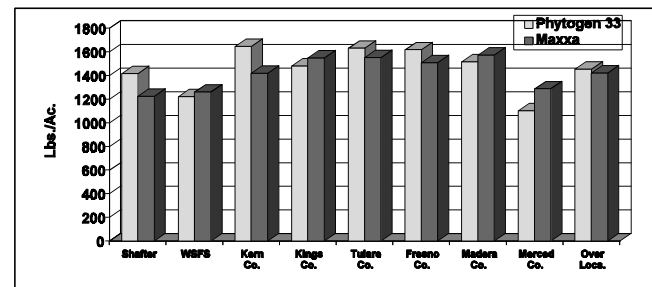


Figure 11. 1996 U. C. Cooperative Extension Approved Cotton Variety Trials.

Table 1. Agronomic properties.

	Maxxa	Phytogen 33
Gin Turn Out	35.2	33.0
Boll Weight (g)	6.7	7.7
Seed Index (g/100 seeds)	12.1	13.5

Table 2. Fiber Quality Traits (J. G. Boswell Lab, 20 Locations, 1994-95).

	Maxxa	Phytogen 33
2.5% Span Length	1.15	1.17 *
Uniformity	47.1	48.9 *
Strength T1 (g/tex)	23.6	24.0 *
Elongation	6.4	6.5 *
Micronaire	3.85	4.24 *

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

Table 3. Spinning Properties (ITC Lab, 6 Locations, 1993-94).

	Maxxa	Phytogen 33
Manufacturing Waste (Total)	19.1	16.4
Single Yarn-Carded 50's-Elongation	4.54	4.70
Single Yarn-Combed 50's-Elongation	4.70	4.80
Skein/Evenness-Carded 50's		
Break Factor	2414	2412
Evenness	23.13	22.06
Neps	1694	1490 *
Skein/Evenness-Combed 50's		
Break Factor	2728	2624
Evenness	17.83	17.48 *
Neps	276	296

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