

**PHY 76 PIMA: A NEW LEADING PIMA VARIETY
FOR THE SAN JOAQUIN VALLEY, CA**

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Abstract

Phytogen Seed Co. LLC has introduced a new mid-full season, conventional Pima variety that exhibits excellent yield potential in the major Pima growing region of the San Joaquin Valley, CA. PHY 76 PIMA was developed by the Phytogen Seed Co. breeding program at Corcoran, CA in the early 1990's and is widely adapted from the southern tier to the central-west side of the San Joaquin Valley, CA. The key objective in developing PHY 76 was to develop a Pima variety which would capture the full-season potential of the SJV and product consistent high yield for western Pima growers. Agronomic practices have evolved in the SJV in recent years by which vegetative growth of Pima varieties is well managed by slight irrigation stress while retaining yield potentials. PHY 76 PIMA exhibits excellent response to this type of cultural practices and can potentially lead to input savings by less water usage. Generally, the earlier maturing Pima varieties are more sensitive to this stress management and yield potentials may suffer. Over four years of Advanced Strains Testing by Phytogen at nineteen test locations, PHY 76 yielded significantly more than Pima S-7 (the San Joaquin Valley Cotton Board standard Pima variety) by two hundred twenty one pounds of lint per acre (an increase of sixteen percent). In the same trials PHY 76 also yielded significantly more than the early variety HTO by 24%. PHY 76 fiber qualities are equal to that of Pima S-7 while fiber elongation is significantly improved. PHY 76 has a significantly larger boll and seed index than Pima S-7. PHY 76 exhibits a plant height 6-9 inches taller than Pima S-7 and resists late season premature cutout (senescence breakdown).

Introduction

PHY 76 PIMA is a new cotton variety, developed for California's San Joaquin Valley by Phytogen Seed Company, LLC by crossbreeding and pedigree selection between 1992 and 1995 as a mid-full season maturity variety. It has been widely tested in the highly productive irrigated San Joaquin Valley, over wide soil types of sandy loam to heavy clay loams, and heat unit accumulations differing as much as 300 H.U. To introduce PHY 76, results of yield and fiber quality comparisons will be discussed.

Materials and Methods

Phytogen conducted performance tests between 1997 and 2001. At each location, PHY 76 was compared to Pima S-7, the San Joaquin Valley Cotton Board (SJVCB) standard Pima variety, in randomized complete block designs with four replications. Yield and fiber quality data were collected. Fiber properties were evaluated on high volume instrumentation (HVI) and individual instruments.

Results and Discussion

Phytogen Seed Co. - 1997 Preliminary Strains Tests (PST) results are shown in Figure 1. PHY 76 yields were higher than those of Pima S-7 at all locations with a significant over location yield advantage of 30%. It was at this juncture that PHY 76 continued in Phytogen Advanced Strains Testing (AST) program and concurrently the SJVCB Pima Variety Tests for the years 1998 through 2000.

Phytogen Seed Co. - 1998 Advanced Strains Tests (AST) are shown in Figure 2. PHY 76 yields were significantly higher than those of Pima S-7 at each of three locations with a 25% yield advantage over locations. A new early maturity Pima variety HTO was evaluated for comparison. Discussions will primarily focus on PHY 76 and Pima S-7.

Phytogen Seed Co. - 1999 Advanced Strains Tests (AST) are shown in Figure 3. PHY 76 yields were significantly higher than those of Pima S-7 at three of seven locations with a 2% yield advantage over locations.

Phytogen Seed Co. - 2000 Advanced Strains Tests (AST) are shown in Figure 4. PHY 76 yields were significantly higher than those of Pima S-7 at four of five locations with a 14% yield advantage over locations.

Phytogen Seed Co. - 2001 Advanced Strains Tests (AST) are shown in Figure 5. PHY 76 yields were significantly higher than those of Pima S-7 at three of four locations with a 27% yield advantage over locations.

An over years yield comparison of PHY 76 and Pima S-7 tested in all PhytoGen AST Trials from 1998 to 2001 is shown in Figure 5 (19 trials total). The mean yield over years of PHY 76 was significantly higher than Pima S-7 by 16% or 221 pounds of lint per acre with thirteen of nineteen trials having significant lint yield advantage over Pima S-7.

Fiber quality results by HVI are shown in Table 1. PHY 76 exhibited high fiber qualities equal to Pima S-7 while fiber elongation of PHY 76 is significantly improved. Fiber quality results by individual instruments are shown in Table 2. Similar to HVI fiber quality results, PHY 76 exhibited fiber qualities equal to Pima S-7 with fiber elongation of PHY 76 is significantly improved.

Agronomic trait results are shown in Table 3. PHY 76 has a significantly large boll, higher seed index, and taller plant height than Pima S-7. In addition, PHY 76 exhibits a significantly higher resistance to late season premature cutout than Pima S-7 (senescence breakdown).

Summary

In multiple PhytoGen Advanced Strains Tests conducted over four years (1998 – 2001), PHY 76 Pima has shown a significant yield advantage over Pima S-7 of 16% and has exhibited wide adaptation in yield performance in the San Joaquin Valley of California. PHY 76 Pima is a mid-full maturity Pima variety developed to capture the full season yield potential of the SJV growing region. It has high quality fiber trait parameters equal to Pima S-7 and resists late season premature cutout. PHY 76 is expected to make an impact in the San Joaquin Valley cotton industry.

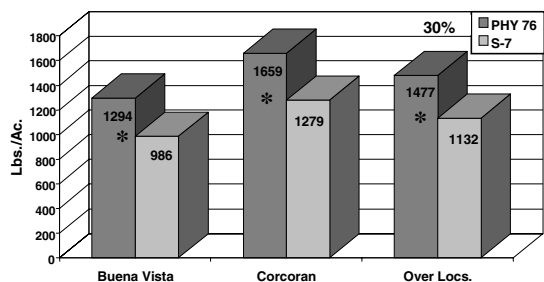


Figure 1. 1997 PhytoGen PST Tests.

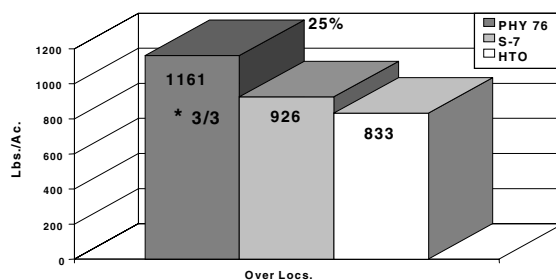


Figure 2. 1998 PhytoGen AST Tests.

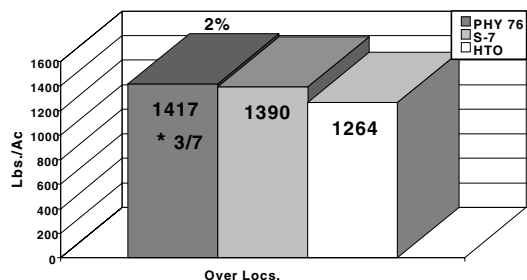


Figure 3. 1999 PhytoGen AST Tests.

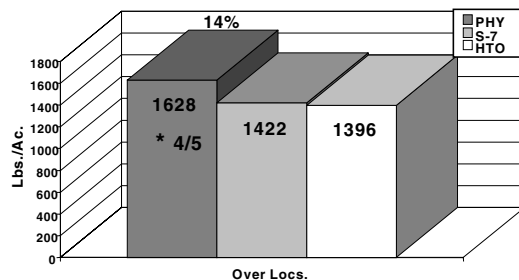


Figure 4. 2000 PhytoGen AST Tests.

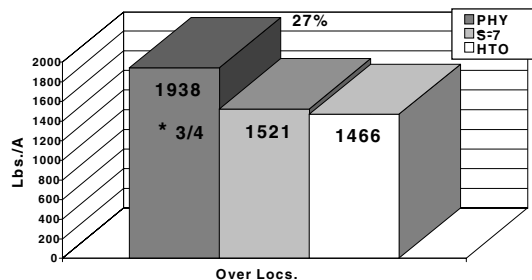


Figure 5. 2001 PhytoGen AST Tests.

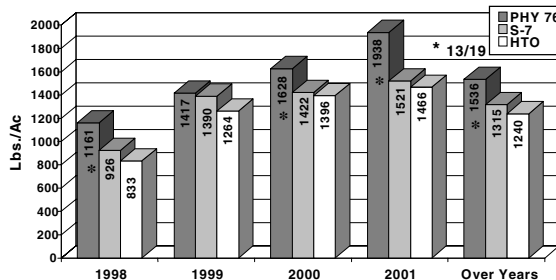


Figure 6. PhytoGen AST Tests Over Years, 19 locs.

Table 1. Fiber Quality Traits (HVI, 11 Locations, 1998-2001).

	PHY 76	Pima S-7	HTO
Micronaire	4.36	4.37	4.27 *
Length	1.38	1.38	1.35 *
Uniformity	88.0	88.2	87.5 *
Strength T1 (g/tex)	41.7	42.1	40.5 *
Elongation	8.24 *	6.54	7.23 *

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

Table 2. Fiber Quality Traits (Individual Instruments, 7 Locations, 1998-2000).

	PHY 76	Pima S-7	HTO
Micronaire	4.41	4.30	4.39 *
2.5% Span Length	1.40	1.41	1.38 *
Uniformity Ratio	49.8	49.2	48.6 *
Strength T1 (g/tex)	33.5	34.2	32.7 *
Elongation	8.57 *	7.19	7.98 *

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

Table 3. Agronomic Traits over years (16 Locations, 1998-2001).

	PHY 76	Pima S-7	HTO
Boll Wt. (gms.)	3.55 *	3.44	3.51
Lint Percent	39.4	39.7	42.5 *
Gin Turn Out %	33.6	33.9	36.3 *
Seed Index (gms.)	13.4 *	12.8	12.6
Plant Height (inches)	44 *	36	
Cut-Out ^{1/}	1.6 *	3.2	

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

^{1/} Cut-Out denotes late season senescence breakdown. Lower rating = resistant.