

**CPCSD GLANDLESS COTTON BREEDING PROGRAM**

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**Abstract**

The glandless trait was discovered in the 1950's by Dr. Scott McMichael in the variety Hopi Moencopi. A glandless plant is essentially free of gossypol glands which normally cover cotton plants. These gossypol glands contain gossypol, a poisonous compound. Genetically the glandless trait is controlled by two recessive genes, *gl2* and *gl3*. When a plant is homozygous for *gl2* and *gl3*, all gossypol glands in the aerial plant and seeds are eliminated. The gossypol in these glands is poisonous to non-ruminant animals. Cottonseed that is free of gossypol is an excellent source of protein for both animal and human consumption. The glandless trait was used by cotton breeders at the U.S.D.A. Cotton Research Station in Shafter for many years to develop lines with good yield and fiber quality. In 1978, the California Planting Cotton Seed Distributors (CPCSD) started a glandless breeding program utilizing the lines developed at the U.S.D.A. Shafter Station. CPCSD is owned and directed by the cotton growers in the San Joaquin Valley (SJV). Our interest is producing adapted high quality commercial glandless Acala varieties that may well be a source of added income for the SJV cotton growers.

In the CPCSD breeding program we have improved the yield and fiber quality of the glandless acala lines (Table 1.). At the same time we have tried to evaluate insect damage associated with the glandless trait. Our observations would suggest those early season pests such as thrips and spider mites are no more severe in the glandless cotton than in normal acala, but lygus present another problem. Some data indicate that mid-season to late-season lygus control should be monitored very closely. We have observed insect damage to be more severe in a test plots of glandless cotton within fields of normal acala, whereas large blocks of glandless acala does not suffer to the same extent.

The glandless CPCSD Acala C-166 was entered into the San Joaquin Valley Cotton Board (SJVCB) trials in 1996. Acala C-166 will complete the SJVCB testing program in 1998 and be eligible for release in March 1999. Table 2. shows the yield comparison of Acala C-166 with the SJVCB Standard Acala Maxxa. Acala C-166 can produce yields similar to Maxxa in some areas with no extra management or special treatments. However, some

locations may require a different insect management program for glandless varieties.

Table 1. 1996 CPCSD Advanced Strain Tests

	Maxxa	C-166	LSD.05
2.5% Span Length	1.16	1.21	0.02
Uniformity ratio	48.9	48.8	ns
Fiber Str.(T-1 Stel)	23.6	25.9	0.9
Elongation (E-1Stel)	6.6	7.0	0.4
Micronaire	4.15	4.10	ns
Yarn Strength (Ne22)	139	158	5.7
Lint Yield (lbs/A)	1459	1409	ns

Table 2 1997 SJVCB Acala Variety Test - Lint Yield (lbs/A)

Location	Maxxa	C-166	LSD.05
Buttonwillow	1252	1304	ns
Wasco	1869	1853	ns
Tulare	1485	1459	ns
Stratford	959	935	ns
WSFS	1857	1556	118
Firebaugh	1616	1533	ns
Chowchilla	1597	1525	ns
Los Banos	1695	1620	58
Mean	1541	1473	ns