

Whitefly Adults in Okra-leaf and Normal-leaf Cottons.

*F. D. Wilson, Research Geneticist; G. D. Butler, Jr., Research Entomologist, Retired
Western Cotton Research Laboratory, USDA-ARS*

ABSTRACT

The sweet potato whitefly, Bemisia tabaci (Gennadius) continues to be a serious pest of cotton and an important vector of several virus diseases of fall vegetables. In our search for resistant germplasm, we counted adult whiteflies on cotton cultivars and breeding stocks in AZ and Israel. At Maricopa (MAC), seven of 19 cottons had significantly fewer whiteflies than the check, 'Stoneville 825'. Five of the seven were okra-leaf and two were normal-leaf cottons. In another experiment at MAC, an okra-leaf cotton did not have fewer whiteflies than a normal-leaf one. At several locations in Israel, the okra-leaf cotton, BD-12, had significantly fewer whiteflies than a number of normal-leaf cottons.

INTRODUCTION

Sweet potato whitefly, Bemisia tabaci (Gennadius), is a serious pest of cotton in many cotton-growing areas. Serious infestations occurred during 1986 in cotton in Arizona and in the Imperial Valley, CA. In California, in addition to causing sticky lint, whitefly adults migrated from the cotton to other crops and transmitted several severe virus diseases such as squash leaf curl and lettuce infectious yellows. No adequate chemical or biological control measures are yet available. The objective of this study was to evaluate cotton breeding stocks and cultivars both in Arizona (Maricopa Agricultural Center: MAC) and in Israel in a search to identify sources of germplasm resistant to the whitefly.

MATERIALS AND METHODS

Experiments at MAC and at several locations in Israel were sampled for whitefly adults by striking 25 cotton terminals per plot three times with a stick over a 10 x 11 x 4 in. open carton having a yellow plastic bottom covered with a thin coat of vegetable oil. The number of adults adhering to the oil was counted.

Test 1 contained 20 cottons in four randomized blocks; plots were 50 ft. long and 8 rows wide; no insecticide was used. Test 2 contained 2 cottons in five randomized blocks; plots were 540 ft. long and 48 rows wide. Insecticides were applied for pink bollworm control. Both tests 1 and 2 were grown at MAC and sampled for whitefly on 13 Sept 1986.

Test 3 contained 10 cottons in replicated plots and grown at five locations in Israel. Different insecticide treatments were used at each location. Test 4 contained 6 varieties in unreplicated plots 300 ft. long and 20 rows wide, and untreated with insecticides and grown at Sede Eliyahau, Israel. Whiteflies were sampled on a number of dates from July to September 1986 in both tests 3 and 4.

RESULTS

Test 1. Seven of the 19 test cottons had significantly fewer whitefly adults than the check cultivar, 'Stoneville 825' (Table 1). Four of the seven were hirsute, okra-leaf, one was semi-smooth okra-leaf, one was semi-smooth regular-leaf, and one was ultra-smooth regular-leaf.

Test 2. No significant difference was observed in the number of whiteflies between the regular-leaf 'Deltapine 61' (157.3 in ethephon-treated plots and 143.2 in untreated plots) and the okra-leaf WC-12NL (155.0 in ethephon-treated plots and 176.7 in untreated plots).

Test 3. The okra-leaf selection Bet Dagan-12 (BD-12) consistently had fewer whiteflies than the nine regular-leaf selections at all five locations (Table 2).

Test 4. BD-12 had significantly fewer whiteflies than the five regular-leaf selections (Table 3). It had 9X fewer whiteflies than 'Eden-1', a cotton grown widely in the Jordan River Valley where whitefly is a serious cotton pest.

Table 1. Mean number of Bemisia tabaci adults in beating samples from cotton at Maricopa, AZ 13 September 1986.

Cotton	N	Trait**		Whiteflies(no.)
		SS	L	
Stoneville 825 (check)	+	-	-	137.0 a*
Gumbo 500	-	-	+	50.8 b
DES-24NL	+	-	+	50.8 b
Stoneville 825NL	+	-	+	45.5 b
Deltapine 712L	-	-	+	42.5 b
Deltapine NSS	+	+	-	28.8 b
Coker 310 ultra-smooth	-	(US)	-	17.8 b
Deltapine 7544NSSL	+	+	+	13.5 b

**means followed by the same letter are not significantly different at the 0.05 level of probability.*

***N=nectariless; SS=semi-smoothleaf; L=okra leaf; US=ultra-smoothleaf.*

Table 2. Mean number of B. tabaci adults on one okra-leaf and nine regular-leaf cottons at five locations in Israel, 1986.

Location	No. samples	leaf selections	okra-leaf
Qiryat Shemona	5	9.6 +/- 2.4	1.7
Gan Shemuel	6	33.6 +/- 6.7	6.2
Eden Farm, Bet She'an	10	56.9 +/- 17.3	15.8
Acco	5	75.5 +/- 10.6	16.0
Bet Dagan			
Very dry	7	33.3 +/- 5.0	13.6
Dry	8	29.2 +/- 4.7	7.7
Normal	8	25.5 +/- 4.7	6.9

Table 3. Mean number of *B. tabaci* adults in five regular-leaf and one okra-leaf cottons grown without insecticide at Sede Eliahau, Israel, 1986.

Cotton	Whiteflies (no.)
Eden-1	112.2 a*
KH-238	93.2 a
D-36	54.3 b
SJ-2	32.4 b
KH-2	30.1 b
BD-12 okra leaf	12.6 c

**means followed by the same letter are not significantly different at the 0.05 level of probability.*