COTTON LEAFHAIRS AND SILVERLEAF WHITEFLIES IN THE LOWER RIO GRANDE VALLEY OF TEXAS THREE YEAR RESEARCH SUMMARY

J. W. Norman, Jr. and A. N. Sparks, Jr.
Texas Agricultural Extension Service
Weslaco, TX

Introduction

Following the severe outbreak of silverleaf whiteflies (*Bemisia agrentifolii*) in the Lower Rio Grande Valley (LRGV), researchers and Extension personnel investigated numerous techniques for management. When silverleaf whiteflies first caused severe damage to cotton in the LRGV, it was observed that there were differences in variety response to whitefly infestation (Norman, et al, 1991). Prior observations in other states had been made of leaf pubescence on whiteflies (Butler, et al, 1984). The smoother the leaf, the better the plants appeared to tolerate whitefly infestations and their feeding damage. Following three years of research of varieties grown in variety trials on the Experiment Station annex farm at Weslaco, we observed the trend for increasing silverleaf whitefly populations with increasing leafhair counts.

Materials and Methods

Two cotton variety tests in each of the years of 1994-1996, were used to test silverleaf response to different leafhair counts. Each test was approximately one acre in size, had twenty four varieties each, arranged in a randomized complete block design. Each plot was 4 rows by 30 feet. Varieties in each test were grouped according to maturity type; early and later maturing types. Individual varieties were grouped into leafhair categories as follows: 0-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80 leaf hairs per $cm^{2.}$ Leafhair groupings for each variety were determined each year by counting leafhairs/cm^2 on the underside of 20 leaves per plot and placing each variety into the appropriate grouping (Norman et. al, 1994). Immature whiteflies were counted weekly starting near mid-May and ending in early July each year. Immature whiteflies were counted on the 5^{th} fully expanded leaf from the terminal, 5 leaves per plot. PC SAS was used to analyze all data except yields from these trials.

Results and Discussion

Data from all three years showed increasing whiteflies as leafhair counts increased (Figure 1). Statistically, all whitefly immature analyzes based on leafhair groupings were significant at p=.05. Within each year, whitefly infestations increased as leafhairs increased. Whitefly counts in individual years showed variation from year to year, however, the general trend of increased whiteflies when leafhairs increased was consistent (Table 1). The data also showed that for every 10 leafhairs per cm^2 there was an approximate average increase of 0.28 whitefly immatures per 2.25 cm^2.

There was some variation in leafhair counts and associated whitefly infestations each year. Some of the variation came from the different varieties planted each year, differences in whitefly infestations each year and differences in leafhair counts within a variety over the three year period (Table 1 and Figure 2). It is interesting to note that some varieties held very stable leafhair counts from year to year and others have large swings from year to year. Despite the variations in the years, the trends stayed the same over the three year period.

While yields are influenced by many factors including whiteflies and other insects as well as weather and cultural practices, yields decreased as leafhairs increased (Table 2).

Acknowledgements

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References

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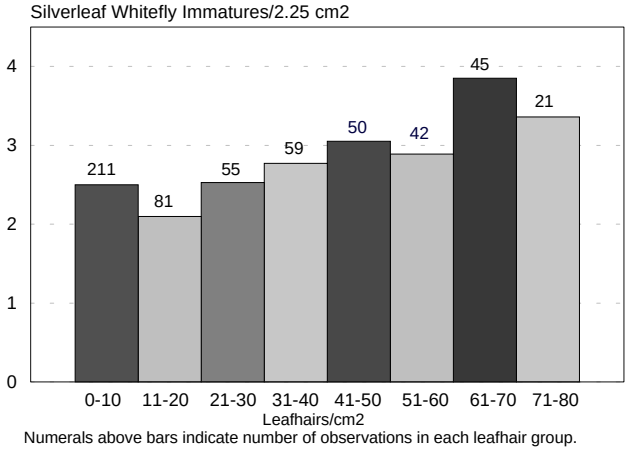

Figure 1 Silverleaf whitefly response to cotton leafhairs, Lower Rio Grande Valley, Texas-1994-1996

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Table 1. Cotton leaf hair averages among selected varieties, LRGV, Texas 1994-96.

VARIETY	1994	1995	1996
HARTZ H-1244	41.85	5.85	32.9
TEXAS 121	12.19	5.89	3.8
DPL 50	7.27	6.13	1.3
DPL-51	4.42	6.91	1.3
STPSA MD 51ne	7.01	7.60	1.7
DPL 5409	4.39	10.69	0.8
DPL 5415	7.34	10.03	11.3
SUREGROW 404	8.01	10.12	2.5
HARTZ H-1220	36.68	15.48	29.3
HARTZ H-1215	30.68	15.89	20.2
HARTZ H-1330	30.49	27.13	113.8
STONEVILLE 132	47.31	27.89	18.2
HARTZ 1380	41.31	37.63	39.8
STONEVILLE LA-887	57.98	42.69	56.6
STONEVILLE 474	102.65	50.34	87.5

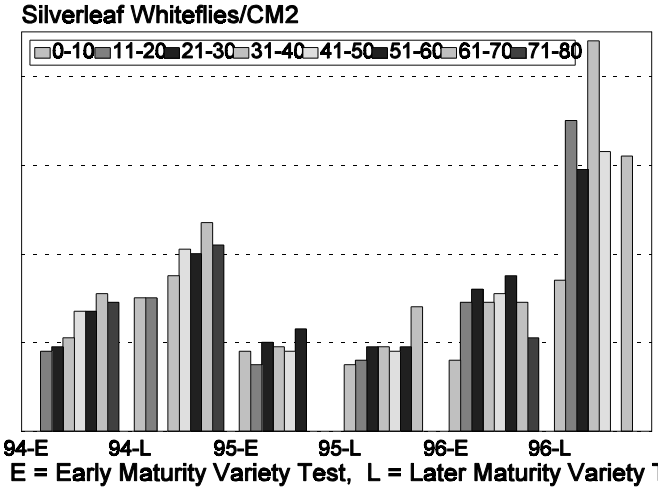

Figure 2. Silverleaf whitefly counts based on leafhair groupings in early and later cotton variety trials, LRGV, Texas 1994-1996

Table 2. Yields based on leafhair groupings[2], LRGV, Texas 1994-1996.

Leafhair Grouping[1]	1994	1995	1996	Average
0-20	773	537	632	647
21-40	733	527	542	601
41-60	655	476	533	555

[1]Other leafhair groupings data not available for three years.
[2]Yields influenced by many factors, not necessarily by leaf pubescence.