

# DIFFERENTIAL SUSCEPTIBILITY OF COTTON CULTIVARS TO SILVERLEAF WHITEFLY, IN THE YAQUI VALLEY, SONORA, MEXICO

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## Abstract

The response of cotton cultivars to silverleaf whitefly populations is important in any program of integrated pest management. The damage of silverleaf whitefly in susceptible cultivars or in tolerant cultivars in a no choice condition may be highest when this pest is present in high populations.

## Introduction

Silverleaf whitefly is a serious pest in the Yaqui Valley, since 1994, affecting several crops besides cotton. The research project for this pest in northwest México “Manejo Integrado de la Mosquita Blanca en el Noroeste de México” considers the plant as a basic subsystem of study, then its behavior is elemental to take decisions. It is important to stress that in varietal response studies to pests, the behavior of tolerant cultivars under no choice conditions is a priority if an effective recommendation is expected to use no susceptible cultivars in the field.

## Materials and Methods

This study was conducted at the Yaqui Valley, Sonora, México, during 1997. The cultivars evaluated were: PAYMASTER 1277, DELTAPINE 5415, DELTAPINE 5690, DELTAPINE 5432, and CIANO CÓCORIM 92 —INIFAP variety of short cycle—. Three kinds of evaluations were conducted; natural oviposition, induced oviposition, and adult emergence in the 1<sup>st</sup> generation under no choice conditions and induced oviposition. A hierarchical design was used with 10 replications per variety. The plot size was 4 row plots, 10 meter rows, and 1 meter between rows. ANOVA and LSD were used for statistical analysis. In the case of adult emergence, heat units (single sine method) were estimated to determine the amount needed for the next generation.

## SLWF Oviposition under Field Conditions

This study was conducted the 181st julian day. In this case, egg counts were made at the 5<sup>th</sup> leaf of the cotton plant. In all cases, 10 replications were carried out in each variety.

## SLWF Oviposition under No Choice Conditions

This study was initiated the 181st julian day. To avoid undesirable ovipositions, non-developed leaves were confined in organdi bags since they show up at the top of the plant. Adults of silverleaf whitefly were captured in groups of fifty by using a manual aspirator and when the leaves reached the 5<sup>th</sup> position the adult infestation was established. Fifty adults were confined for 24 hours in each replication, on the 5<sup>th</sup> leaf of each cotton plant to count egg oviposition. The eggs were assessed 24 hours after they were oviposited by confined adults.

## SLWF Adult Emergence under No Choice Conditions

This study was initiated the 175th julian day. To avoid undesirable ovipositions, non-developed leaves were confined in organdi bags since they show up at the top of the plant. Adults of silverleaf whitefly were captured in groups of fifty by using a manual aspirator. Fifty adults were confined in organdi bags on the 5<sup>th</sup> leaf of the cotton plant by replication (to avoid no induced oviposition). After 24 hours of induced oviposition, adults were released and the leaves with the eggs continued being confined in order to avoid undesirable natural oviposition in field conditions. The emergence of adults was assessed in each confined leaf. The heat units necessary for the adult emergence were estimated.

## Results and Discussion

The results are shown in the table 1 for oviposition under field conditions, in table 2 for oviposition under no choice conditions, and in table 3 for adult emergence under no choice conditions.

## Oviposition of Silverleaf Whitefly in Field Conditions

Under conditions of free choice (table 1) all the varieties showed a good performance against this pest; however, the natural population for this year was the lowest since 1994. All the varieties are considered tolerant to silverleaf whitefly under field conditions.

## Oviposition of Silverleaf Whitefly under No Choice Condition

Table 2 shows the relationship between the characteristics of the varieties and the ovipositions of silverleaf whitefly under no choice conditions. The data show clear differences among varieties despite responses under field conditions being similar. DELTAPINE 5432 and CIANO CÓCORIM92 were the varieties most preferred by the pest for oviposition. The differences found are important at the biological level.

## Adult Emergence of Silverleaf Whitefly under No Choice Condition

Table 3 shows the behavior of silverleaf whitefly in different cotton cultivars. These data have no relationship between the data of oviposition (table 2) and adult emergence. In the first place, the evaluations were made on

different days so that the oviposition number could have been different due to climatic conditions. In the second place, we found that the life expectancy of silverleaf whitefly was different among cultivars evaluated; in this case, it's important to stress that one of the varieties that had the highest oviposition range of silverleaf whitefly, CIANO CÓCORIM 92, had the lowest life expectancy of the pest. The life expectancy is considered the most important parameter in order to define the behavior and the damage of the pest in the crop. With these criteria, the most tolerant variety to silverleaf whitefly was CIANO CÓCORIM 92. Finally, the heat units necessary to one generation of silverleaf whitefly were the same in all the varieties studied.

### **Summary**

All the varieties are considered tolerant to the pest under natural conditions. The varieties showed differences in relation to egg oviposition, in spite of responses in field conditions being similar. The life expectancy of silverleaf whitefly was different among cultivars evaluated. The most tolerant variety to silverleaf whitefly was CIANO CÓCORIM 92.

Table 1. Eggs of silverleaf whitefly on cotton under choice conditions.

Variety	Eggs
PAYMASTER 1277	0.1
DELTAPINE 5415	0.1
DELTAPINE 5690	0.6
DELTAPINE 5432	0.0
CIANO CÓCORIM 92	0.0

Table 2. Eggs of silverleaf whitefly on cotton under no choice conditions.

Variety	Eggs	LSD
PAYMASTER 1277	25.0	a b
DELTAPINE 5415	30.5	a
DELTAPINE 5690	12.6	c
DELTAPINE 5432	14.1	b c
CIANO CÓCORIM 92	30.5	a

Table 3. Adult emergence of silverleaf whitefly on cotton under no choice conditions.

Variety	Adult emergence	Heat units
PAYMASTER 1277	11.8	275
DELTAPINE 5415	18.4	275
DELTAPINE 5690	21.5	275
DELTAPINE 5432	24.3	275
CIANO CÓCORIM 92	11.5	275