

Cotton Pest Control Program

Silverleaf Whitefly Report for the San Joaquin Valley

2021 Season Final Report
June 28, 2021 – September 3, 2021

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Source: USDA-ARS

I. Introduction

The main purpose of the survey was to collect data on the temporal and geographical distribution of the silverleaf whitefly (SLWF), an invasive pest whose hosts include cotton and several other agricultural and native plant species. The SLWF causes damage to cotton crops in several ways, the foremost method is through the secretion of honeydew onto the leaves which promotes the growth of the fungal disease, black sooty mold, and can also lead to sticky cotton during ginning. Therefore, this survey included the screening of sampled leaves for honeydew secretion and black sooty mold. Other whitefly species can be indicative of the presence or the future presence of SLWF species. Accordingly, this survey screened sampled leaves for other whitefly species. Aphids were included in this survey because, similarly to SLWF, aphids are a pest that secrete honeydew which promotes the growth of black sooty mold. In addition to SLWF, aphids, honeydew, black sooty mold, and other whitefly species, the survey included the inspection of sampled leaves for mites and armyworm, which are other pest species commonly found on cotton leaves. All sampled leaves were visually inspected with a microscope to identify the aforementioned pest species and pest indicators.

The sampling period for the silverleaf whitefly (SLWF) surveys began on Monday, June 28, 2021 and continued through Friday, September 3, 2021. Program personnel collected samples from designated sites at 10 percent of all cotton fields in each county of the San Joaquin Valley. The Program had a total of 125 SLWF sampling sites with 10 sites in Kern County, 30 sites in Kings County, 11 sites in Tulare County, 27 sites in Fresno County, 2 sites in Madera County, and 45 sites in Merced County. At each site one leaf sample from 10 different cotton plants was collected for a total of 10 leaves per site. However, during the first three rounds of sampling (June 28 – August 6) not all sites were able to be sampled in Fresno, Madera, Merced, and Kings Counties due to field conditions and staffing issues.

II. Kern County

Out of the ten sample sites in Kern County, six sites had at least one leaf containing SLWF nymphs during the 2021 cotton growing season. A total of 500 leaves were collected, of which 16 leaves (3%) contained SLWF nymphs (**Table 1**).

Out of the ten sites, nine had at least one leaf containing aphids during the season. Out of the 500 leaves collected, 60 leaves (12%) contained aphids (**Table 2**).

Out of the ten sites, honeydew and sooty mold were not found at any sites. Mites were found at two sites, but armyworm and other whitefly species were not found at any site.

III. Kings County

Out of the 30 sample sites in Kings County, 18 sites had at least one leaf containing SLWF nymphs during the 2021 cotton growing season. A total of 1,120 leaves were collected, of which 70 (6%) leaves contained SLWF nymphs (**Table 1**).

Out of the 30 sites, 28 had at least one leaf containing aphids during the season. Out of the 1,120 leaves collected, 162 leaves (14%) contained aphids (**Table 2**).

Out of the 30 sites, honeydew and sooty mold were found at one site. Mites were found at one site, other whitefly species at one site, and none of the sites had leaves with armyworm.

IV. Tulare County

Out of the eleven sample sites in Tulare County, seven sites had at least one leaf containing SLWF nymphs during the 2021 cotton growing season. A total of 550 leaves were collected, of which 14 leaves (3%) contained SLWF nymphs (**Table 1**).

Out of the eleven sites, ten sites had at least one leaf containing aphids during the season. Out of the 550 leaves collected, 66 leaves (12%) contained aphids (**Table 2**).

Out of the eleven sites, honeydew was found at two sites and sooty mold was found at two sites. Mites were found at one site, whereas none of the sites had leaves with armyworm or other whitefly species.

V. Fresno County

Out of the 27 sample sites in Fresno County, twelve sites had at least one leaf containing SLWF nymphs during the 2021 cotton growing season. A total of 1,340 leaves were collected, of which 51 (4%) leaves contained SLWF nymphs (**Table 1**).

Out of the 27 sample sites, 16 sites had at least one leaf containing aphids during the season. Out of the 1,340 leaves collected, 39 leaves (3%) contained aphids (**Table 2**).

Out of the 27 sites, honeydew was found at four sample sites and sooty mold was found at eight sites. Mites, other whitefly species, and armyworm were not found at any of the sites.

VI. Madera County

Out of the two sample sites in Madera County, one site contained leaves with SLWF nymphs during the 2021 cotton growing season. A total of 80 leaves were collected, of which 5 leaves (6%) contained SLWF nymphs (**Table 1**).

Out of the two sites, none had at least one leaf containing aphids during the season. Out of the 80 leaves collected, 0 leaves (0%) contained aphids (**Table 2**).

Honeydew and sooty mold were not found at the two sample sites. Mites, other whitefly species, and armyworm were not found at the two sites.

VII. Merced County

Out of the 45 sample sites in Merced County, 19 sites had at least one leaf containing SLWF nymphs during the 2021 cotton growing season. A total of 2,160 leaves were collected, of which 100 leaves (5%) contained SLWF nymphs (**Table 1**).

Out of the 45 sample sites, 33 sites had at least one leaf containing aphids during the season. Out of the 2,160 leaves collected, 140 leaves (6%) contained aphids (**Table 2**).

Out of the 45 sites, honeydew was found at 10 sample sites and sooty mold was found at 13 sites. Mites, other whitefly species, and armyworm were not found at any of the sites.

VIII. Tables and Graphs

Table 1: SLWF 2021 Survey Total Leaf Count

<u>County</u>	<u>Sample Sites</u>	<u>No. Leaves in Each Range of Nymphs Per Leaf</u>				<u># Leaves</u>	<u>% Leaves w/ SLWF nymphs</u>
		<u>0</u>	<u>1 - 5</u>	<u>6 - 49</u>	<u>50+</u>		
Kern	10	484	16	0	0	500	3%
Kings	30	1,050	68	2	0	1,120	6%
Tulare	11	536	14	0	0	550	3%
Fresno	27	1,289	31	20	0	1,340	4%
Madera	2	75	5	0	0	80	6%
Merced	45	2,060	79	21	0	2,160	5%
Totals	125	5,494	213	43	0	5,750	4%

Table 2: Aphids 2021 Survey Total Leaf Count

<u>County</u>	<u>Sample Sites</u>	<u>No. Leaves in Each Range of Aphids Per Leaf</u>				<u># Leaves</u>	<u>% Leaves w/ aphids</u>
		<u>0</u>	<u>1 - 5</u>	<u>6 - 49</u>	<u>50+</u>		
Kern	10	440	54	6	0	500	12%
Kings	30	958	134	27	1	1,120	14%
Tulare	11	484	63	3	0	550	12%
Fresno	27	1,301	27	12	0	1,340	3%
Madera	2	80	0	0	0	80	0%
Merced	45	2,020	122	18	0	2,160	6%
Totals	125	5,283	400	66	1	5,750	8%

Figure 1: Percent of Leaves Collected Containing SLWF and Aphids - 2021 Survey Total

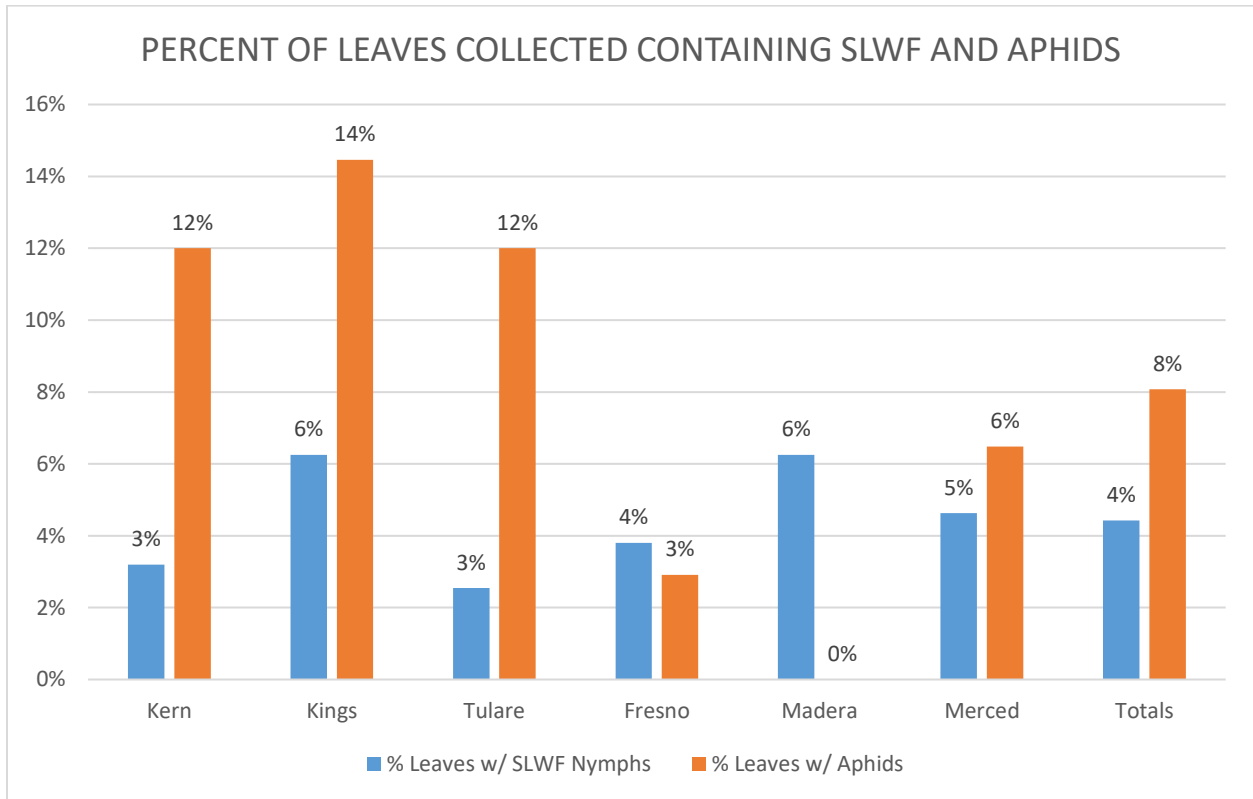


Table 3: Percent of Sample Sites Containing Leaves with Other Pests or Pest Indicators
 – 2021 Survey Total

<u>County</u>	<u>Other Whitefly</u>	<u>Mites</u>	<u>Armyworm</u>	<u>Honeydew</u>	<u>Sooty Mold</u>
Kern	0%	20%	0%	0%	0%
Kings	3%	3%	0%	3%	3%
Tulare	0%	9%	0%	18%	18%
Fresno	0%	0%	0%	15%	30%
Madera	0%	0%	0%	0%	0%
Merced	0%	0%	0%	22%	29%

Figure 2: Percent of Sample Sites Containing Leaves with Other Pests or Pest Indicators – 2021 Survey Total

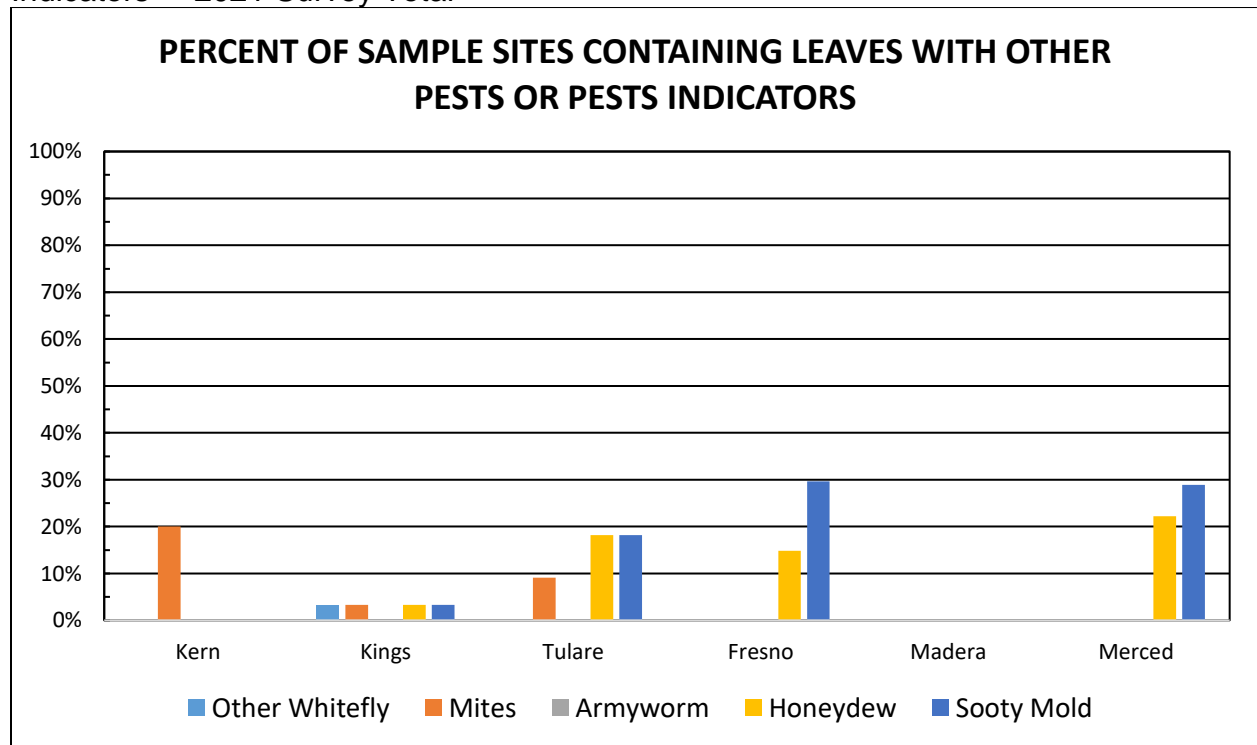


Table 4: Percent of Sample Sites Containing Leaves with Other Pests or Pest Indicators - 2017 through 2021

	<u>Other Whitefly</u>					<u>Mites</u>				
	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Kern	0%	0%	13%	0%	31%	20%	42%	80%	58%	92%
Kings	3%	0%	5%	0%	29%	3%	30%	79%	63%	96%
Tulare	0%	0%	0%	0%	36%	9%	54%	59%	67%	91%
Fresno	0%	0%	71%	12%	28%	0%	18%	100%	67%	93%
Madera	0%	0%	100%	50%	100%	0%	0%	100%	100%	100%
Merced	0%	0%	84%	27%	19%	0%	13%	100%	68%	94%

	<u>Armyworm</u>					<u>Honeydew</u>				
	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Kern	0%	8%	13%	5%	23%	0%	8%	60%	53%	100%
Kings	0%	3%	5%	3%	21%	3%	35%	19%	45%	71%
Tulare	0%	0%	6%	0%	27%	18%	9%	12%	48%	64%
Fresno	0%	3%	3%	17%	24%	15%	100%	92%	53%	45%
Madera	0%	0%	0%	0%	0%	0%	100%	100%	100%	0%
Merced	0%	6%	5%	11%	13%	22%	100%	88%	71%	32%

	<u>Sooty Mold</u>				
	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Kern	0%	8%	40%	68%	92%
Kings	3%	11%	12%	53%	88%
Tulare	18%	36%	0%	67%	91%
Fresno	30%	15%	17%	50%	28%
Madera	0%	100%	50%	100%	0%
Merced	29%	25%	33%	71%	65%

Figure 3: Percent of Leaves Collected Containing SLWF – 2017 through 2021

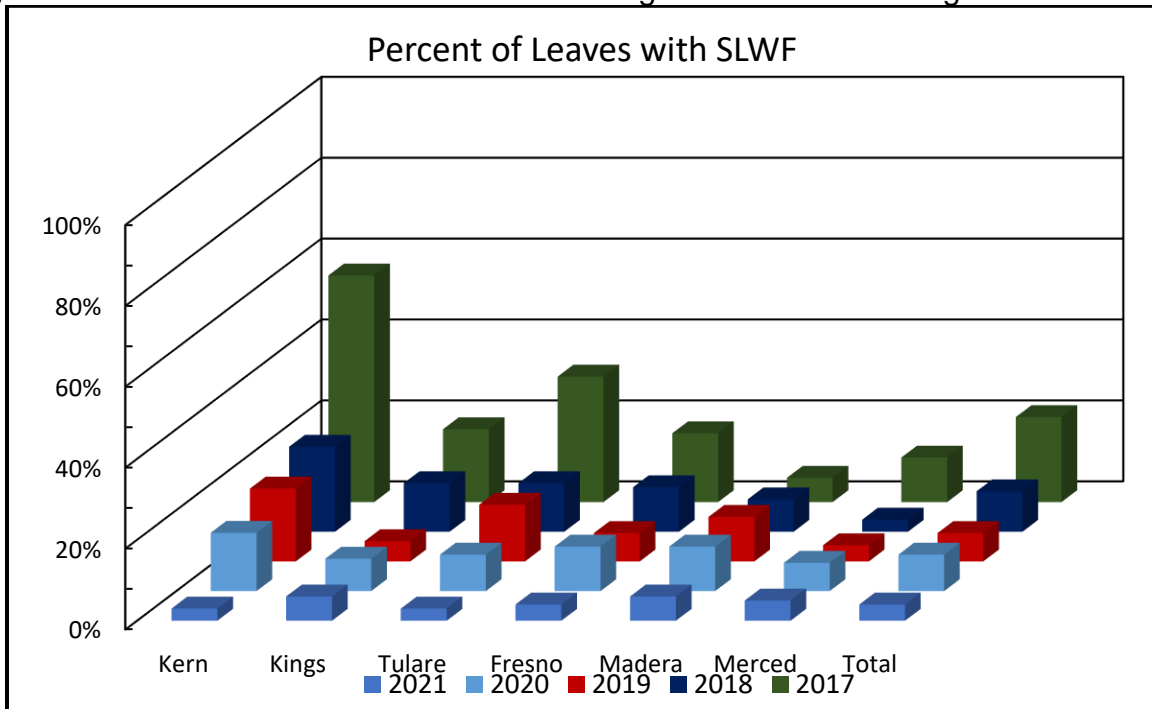


Figure 4: Percent of Leaves Collected Containing Aphids – 2017 through 2021

