

# Worm Infestation of Tomatoes

western yellow-striped armyworm on tomatoes controlled in second year of trials conducted in San Joaquin County fields

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A caterpillar control program in nine commercial tomato fields—in San Joaquin County in 1956—repeated the successful trials in 1955 because of reports of suspected resistance of the corn earworm to DDD and DDT.

The fields selected for the 1956 study were in several localities from the west to the east side of San Joaquin County. The growers cooperated in the project and kept records of the material used and the date and rate of application.

During the growing period three surveys were conducted to determine the seasonal trend of infestation. Where thoroughly applied two to three treatments gave excellent control of caterpillars. Little evidence of infestation was found during the maturing of the crop, and most of the loads delivered to the cannery were graded free of worm damage. As in 1955 there was no way of deter-

mining just how severe the infestation of the corn earworm would have been in the absence of treatment. However, the season was one which favored a severe outbreak of the western yellow-striped armyworm, a caterpillar that is a serious pest of tomato as well as numerous other crops including alfalfa and cotton.

Practically no tomato field escaped an invasion of the armyworm but surveys made during the growing period showed that properly applied treatments were highly effective in checking the pest. Where the infestations developed from eggs laid in the tomato fields the caterpillars were destroyed shortly after hatching.

Most annoyance resulted from migrations of caterpillars into tomato fields from adjacent alfalfa fields when they were cut for hay. To stop such migra-

tions most growers established DDT dust strip barriers between the tomato and alfalfa fields. Where the barriers were at least 8" wide and properly applied good protection was obtained. The most effective barrier was one with the DDT dust placed in the bottom of a small, relatively smooth furrow that had a steep side in front of the crop to be protected. Worms trying to crawl up the steep furrow wall would fall back into the DDT dust and become coated with a lethal dosage of the insecticide.

Where the barriers were too narrow or placed over cloddy soil the control was poor. In some localities barriers were set up too late—or not at all—and serious damage occurred along the edges of those fields. In a few cases the attacked plants were nearly defoliated. Because of the large size of the migrating caterpillars, control—after the pests reached the tomato fields—was difficult unless the affected plants received a thorough coating of insecticide. In some cases, treatments by airplane had to be applied as sprays to get sufficient coverage of border areas in regions subject to wind.

Activity of other tomato pests in the selected fields was observed. In none of them was damage by the tomato russet mite encountered. In two of the nine fields a moderate to severe infestation by the tomato leaf miner occurred. In one field, crickets—migrating from adjacent fields of barley stubble—caused some damage as the earliest fruits started to ripen. Some of these were nearly completely eaten; but the cricket population largely disappeared after the initial damage was noted.

After two years of study there is little evidence of the corn earworm becoming resistant to DDT or DDD. However, no information is available as to how serious the pest might have been had no control measures been applied. Where treatments were carefully applied they were highly effective in controlling one of the most destructive western yellow-striped armyworm infestations ever to occur in San Joaquin County tomato fields.

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Treatment of Tomatoes Infested During Growth of Crop and the Degree of Worm Damage Found in Tomatoes Delivered to the Cannery.<sup>a</sup>

Location	First application			Second application			Third application		
	Date	Insecticide	Pounds per acre	Date	Insecticide	Pounds per acre	Date	Insecticide	Pounds per acre
Tracy	July 20	5% DDD 50% sulfur	25	Aug. 23	5% DDD 75% sulfur	30	....	....	....
Tracy	July 18	10% Toxa-35 phene 50% sulfur	35	Aug. 15	5% DDD 75% sulfur	40	....	....	....
Tracy	July 11	5% DDD 75% sulfur	25	Aug. 19	5% DDD 75% sulfur	25	....	....	....
Roberts Island	July 14	5% DDD 75% sulfur	35	Aug. 21	5% DDD 75% sulfur	35	....	....	....
Roberts Island	July 13	5% DDD 75% sulfur	30	Aug. 6	5% DDD 50% sulfur	35	....	....	....
Roberts Island	June 25	10% Toxa-25 phene 50% sulfur	25	Aug. 8	5% DDT 1 1/2% dieldrin 50% sulfur	30	....	....	....
Stockton	July 11	5% DDD 50% sulfur	30	Aug. 15	5% DDT 75% sulfur	40	....	....	....
Linden	July 7	5% DDT	50	July 18	10% Toxa- phene 50% Sulfur	35	Aug. 20	10% Toxa- phene 50% sulphur	35
Linden	July 4	5% DDD 75% sulfur	26	Aug. 18	5% DDT 50% Sulfur	30	....	....	....

Infested Tomatoes on Indicated Dates and Worm Damage in Delivered Loads.<sup>b</sup>

Location	July 17	Aug. 7	Aug. 28	Number of loads delivered to cannery	
	Corn earworm %	Corn earworm %	Corn earworm %	No worm damage	Graded 1/2% worm damage
Tracy	0.00	0.00	0.50	9	0
Tracy	0.00	0.00	0.00	133	2
Tracy	0.00	0.00	0.25	44	0
Roberts Island	0.75	0.00	0.00	49	0
Roberts Island	0.00	0.00	0.00	66	0
Roberts Island	0.00	0.50	0.00	211	5
Stockton	0.25	0.50	0.00	177	2
Linden	0.00	0.75	0.00	...	...
Linden	0.33	0.25	0.25	34	0

<sup>a</sup> With the exception of a single application all treatments were applied by airplane.

<sup>b</sup> No recent infestation by hornworms, beet armyworm, potato tuber moth or tomato pinworm was encountered in any of the three surveys conducted.