Control tests for

Tomato Insects

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Chemical control of tomato caterpillars and of tomato leafminer was studied in fields near Tracy.

Because of complaints that DDD no longer gave effective control of the corn earworm attacking tomato in the Tracy area, a 36-acre tomato field in that region was used for tests of four dust treatments, each on a nine-acre plot. The four dusts —10% Toxaphene, 5% Sevin plus 75% sulfur, 5% DDD plus 75% sulfur, and 5% DDT plus 75% sulfur—were applied by airplane on August 6, September 8, and October 1, using approximately 33 pounds per acre at each application. Surveys of the small green fruit were conducted during the growth of the crop, and at least 100 fruits were counted in each of three sub-plots of the several treatments. Injured tomatoes were classed as either severely infested—fruits attacked by the corn earworm—or superficially injured—fruits attacked by other caterpillars, mostly the beet armyworm. Two final surveys were made of fruit ready to harvest, using the same categories. No attempt was made to separate out the fruit that had been injured by corn earworm. The classification of superficial injury was used for tomatoes with shallow feeding wounds that had healed over, or with other minor feeding scars.

All of the insecticide treatments afforded good protection. The results of the early surveys and of the two preharvest surveys indicated that DDD was perhaps slightly better than the others.

The insecticides were put to a severe test. During the growth of the crop there was evidence of a substantial infestation of beet armyworm. Observations throughout the area showed that the corn earworm was more abundant than it had been for a number of years. In the check plot, associated with another experiment, up to 36% of the tomatoes at harvest were infested with the corn earworm.

At the time of the first insecticide application, on August 8, there was a light infestation of tobacco hornworm, but a hornworm problem never developed in any of the treatments.

No tomato russet mite infestation developed in any of the treatments or anywhere in the area, and it is possible that the season was unfavorable for development of destructive mite populations.

An experiment to control the tomato leafminer was conducted in a heavily infested field near Tracy. At the time of treatment the vines measured about one foot in diameter and the lower leaves were heavily mined. Test plots included an untreated check, Diazinon, Korlan, parathion, and parathion plus sugar. The insecticides were used as emulsions and applied by airplane at the rate of one half pound of actual ingredient in 10 gallons of water per acre. The sprayed plots were eight or more acres in extent. An additional plot was treated with 2% parathion dust at approximately 30 pounds per acre. All the insecticides gave a good kill of flies and of the maggots in mines. Excellent control of the miners extended over a two-week period, but by the end of the third week mining activity was again well under way. Although there was some further increase of leafminers, parasites entered the picture and no additional treatments were required.

The highest population of leafminers encountered in the experimental series developed in the check plot. A partial kill of miners occurred from a drift of chemicals through the check when the other plots were treated. It is possible that the partial kill was more than offset by an adverse influence of the insecticide on parasites of the pest, which may have resulted in the increase of leafminers.

Trend of Infestation by Corn Earworm and Beet Armyworm in Small Developing Tomatoes

Treatment*	Percent of fruit infested†											
	Aug. 7		Aug. 21		Sept. 3		Sept. 14		Sept. 22		Sept. 29	
	Severe	Superficial	Severe	Superficial	Severe	Superficial	Severe	Superficial	Severe	Superficial	Severe	Superficial
10% Toxaphene	0.00	0.00	0.67	0.33	2.0	0.33	2.33	0.00	2.67	1.67	2.67	3.18
5% Sevin, 75% sulfur	0.00	0.00	1.00	0.00	3.33	0.67	0.33	0.00	2.67	2.00	4.67	3.00
5% DDD, 75% sulfur	0.00	0.00	0.00	0.33	1.00	0.33	1.00	0.67	0.33	1.33	2.1	1.00
5% DDT, 75% sulfur	0.00	0.00	0.00	0.00	2.33	0.00	0.33	0.67	2.33	2.33	4.33	3.67

* Three applications by airplane, each at approximately 33 pounds per acre, on August 6, September 8, and October 1.

† Severe infestation—corn earworm; superficial infestation—other caterpillars, mostly beet armyworm.

Degree of Infestation by Caterpillars in Tomatoes at Harvest

Treatment*	Percent of tomatoes infested†			
	First picking October 11		Second picking October 29	
	Severe	Superficial	Severe	Superficial
10% Toxaphene	2.33	3.00	1.80	1.08
5% Sevin, 75% sulfur	2.33	2.00	1.67	1.00
5% DDD, 75% sulfur	0.67	1.00	1.20	0.67
5% DDT, 75% sulfur	0.33	3.67	2.92	1.16

* Three applications by airplane, each at approximately 33 pounds per acre, on August 6, September 8, and October 1.

† Severe infestation—corn earworm; superficial infestation—other caterpillars, mostly beet armyworm.

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Control of

TADPOLE SHRIMP

The tadpole shrimp often causes extensive damage to rice plant seedlings in many of the important rice-growing counties of the Sacramento Valley. In their foraging activities, shrimp cause two types of damage: stunting, disfigurement, or death to small plants by chewing; and uprooting of plants which then float to the surface and often collect in windrows. Shrimp movements also muddy the water, which many rice experts consider an adverse condition for optimum rice growth.

Shrimp eggs present in the soil hatch when the fields are flooded for planting. Potential damage is therefore apparently greater when planting is delayed after flooding.

Adequate control may still be achieved with DDT or copper sulfate. Experiments indicate that Sevin, Thiodan, Diazinon, and malathion offer possibilities for shrimp control but are not recommended for use on rice.—*A. A. Grigarick, Dept. of Entomology, Davis.*