

INSECTICIDE EVALUATION FOR COT

Results of these 1967 experiments indicate that the combination of toxaphene plus DDT is still the most effective and economical insecticide treatment for bollworm control.

THE COTTON BOLLWORM, *Heliothis zea* (Bodie), has been very destructive to the California cotton crop during the past three seasons. Pesticide evaluation research has been continued during the 1967 season to include several newly registered pesticidal compounds for controlling this pest. This progress report concerns research conducted with Azodrin, methyl parathion, Thiodan, Thuricide, toxaphene + DDT, and Sevin, in experiments carried out on the farms of three cooperating cotton growers.

The insecticides, combinations, and rates used in these tests were: Azodrin at 0.94 lb per acre, and Azodrin + toxaphene (0.94 lb + 2 lbs per acre); methyl parathion at 1 lb per acre, and methyl parathion + molasses (1 lb + 1 gallon per acre); Thiodan C.O. at 1 lb per acre; Thuricide at 2 quarts per acre; toxaphene + DDT (4 lbs + 2 lbs per acre); and Sevin + sulfur 10-50 dust at 40 lbs per acre. All treatments were applied by aircraft with Azodrin, methyl parathion and Thiodan applied in 5 gallons of total spray per acre, and toxaphene + DDT, and Thuricide, in 10 gallons of total spray per acre.

The frequency of application was based on need, as determined by worm counts, and recommendations of the pesticide manufacturers. Treatments using Azodrin and methyl parathion were generally applied at three- or four-day intervals.

Subsequent series of applications were based on need as determined by worm counts. Treatments with toxaphene + DDT and Sevin + sulfur were made as single applications, with subsequent applications based upon need as determined by worm counts. Thiodan was applied as a single application with subsequent treatments as needed but not closer than 10-day intervals. Thuricide was applied weekly. Treatments were replicated two, three or four times—depending on the size of the field.

Bollworm abundance was determined by counting the worms on the upper half of 10 adjacent plants. Five or more subsample locations were also counted in each replicate. All bollworms were classified by size: (1) less than one-quarter-inch in length, (2) one-quarter to one-half-inch in length, (3) one-half to one-inch in length, and (4) over one-inch in length. Size classification allowed a more accurate evaluation of worm kill by the toxicants used.

In addition to evaluating worm abundance as affected by treatment with the several toxicants, the plots were also harvested to obtain yield information. In each plot the center eight or twelve rows were harvested and lint cotton yields were determined.

Bollworms began to appear in the first experimental field during mid-August with a uniform infestation throughout the field. Insecticide applications were initiated on August 21 when the count ranged from 12 to 20 worms less than one-half inch long per 100 plants.

Insecticides used were: Azodrin, Azodrin + toxaphene, and toxaphene + DDT. These materials were compared with an

untreated check, and all were replicated four times. The worm counts and treatment dates are presented in graphs of figure 1 and harvest information is presented in the table. Individual applications of toxaphene + DDT appeared to provide delayed, but effective, control of the bollworms. Treatments with Azodrin and Azodrin + toxaphene had to be repeated, and worm size classifications recorded following treatments suggest that only a small percentage of the worm population was killed.

Sevin + sulfur dust, and Thuricide spray were compared with an untreated check plot (all replicated three times). Treatment dates and worm counts are presented in figure 2 and the harvest information is presented in the table. In this experiment, individual applications of Sevin + sulfur provided a significant reduction in worms. However, populations rebounded rapidly, requiring re-treatment every 10-12 days. Thuricide failed to provide a significant reduction in numbers of worms. As a result, a Sevin concentrate dust was applied to these experimental plots later in the season—providing some control but not considered satisfactorily effective.

Bollworm populations were compared in plots treated with methyl parathion,

COTTON BOLLWORM TESTS—TREATMENT, HARVEST AND YIELD INFORMATION

Treatment per acre	Lint yield per acre			Increase over check	No. applications	
	1st pick	2nd pick	Total			
EXPERIMENT NO. 1*						
Azodrin	0.94	685	128	813 a	112	6
Toxaphene + DDT	4 + 2	683	153	836 a	135	3
Toxaphene + Azodrin	2 + 0.94	625	129	753 ab	52	4
Check		594	107	701 b		0
EXPERIMENT NO. 2*						
Sevin + sulfur	4 + 20	1036	85	1121	167	5
Check		857	97	954		0
EXPERIMENT NO. 3**						
Methyl parathion	1	717 a	85	802 a	59	4
Methyl parathion + molasses	1 + 1 (gal)	722 a	83	805 a	62	4
Thiodan	1	721 a	95	816 a	73	3
Check		670 b	72	743 b		0
EXPERIMENT NO. 4						
Sevin + sulfur	4 + 20	736	101	837		2
Azodrin	0.94	742	122	864		5

* Means followed by the same letter are not significantly different at the 5% level.
** Means followed by the same letter are not significantly different at the 1% level.

FIG. 1



