CHEMICAL CONTROL OF PINK BOLLWORM in Imperial Valley

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THE PINK BOLLWORM, *Pectinophora gossypiella* (Saunders) became a major pest of southern California cotton in 1965 and 1966. Since that time, one of the primary methods of controlling this insect has been the use of insecticide sprays. Spray treatments have usually been applied by aircraft at five- or six-day intervals beginning in late June or early July. Because of the protected habitat of the larvae, treatments have normally been directed against the adult moths.

Tests were conducted in the Imperial Valley to evaluate chemicals for pink bollworm control under California conditions during 1967 and 1968. The experimental design in 1967 was a randomized complete block with four replications and five-acre blocks. Materials were applied by air in five gallons of diluted spray per acre at seven-day intervals. Each chemical was rated for effectiveness with weekly samples of green bolls (15 to 20 days old) from each block. These bolls were examined for the presence of larval mines and/or live pink bollworm larvae.

The 1967 test (table 1) showed that the chemicals Guthion, Sevin, and Azodrin were the most effective against pink bollworm, while Methoxychlor, Biothion (Abate), Thiodan and Dylox were less effective in descending order. Although boll sampling was continued after the October 19 date shown in table 1, these later data were not included in the statistical analysis of the experiment because of the probable influence of larval diapause and defoliation on the counts. Examination of the 1967 data also showed that when effective chemicals were used (i.e., Guthion), it took three to four weeks before there was any distinct reduction in larval populations.

The test plot design established in 1968 was the same as for 1967, except that a six-day treatment interval was used instead of a seven-day interval. Tests with Thiodan and Sevin were repeated in 1968 as a performance standard against the 1967 results. Biothion was retested at a higher rate in 1968. In addition to the regular pink bollworm materials used in the test in 1968, an application of 1.5 lbs per acre of Perthane was included in the September 14 treatment to control cotton leaf perforator.

The data from 1968 (table 2) show that pink bollworm populations were reduced to low numbers by EP-333 (Fundal), Sevin, Gardona, and Biothion. Thiodan was again not one of the most effective materials, nor were American Cyanamid 47470 and Occidental 2168. Because the test was started earlier in the season than the 1967 test, pink bollworm populations were generally lower in all the treated plots in 1968. Occidental 2168 was not available for use on the first three treatment dates in 1968. Results of three applications of this material indicated that it would be effective against the pink bollworm (see table 2, September 12 through 26 counts). However, under late-season population pressures, Occidental 2168 failed to keep the larval counts at their previous low levels.

Biothion, EP-333, Dylox, Methoxychlor, Thiodan and Occidental 2168 were included in these tests because of their reported low toxicity to honeybees and other beneficial insects. Of these materials, EP-333 and Biothion gave a high degree of control of pink bollworm, but Biothion, as well as the other organophosphorous chemicals tested, had the disadvantage of not being effective against the cotton leaf perforator in the 1968 test. In addition, examination of suction-machine samples taken during 1968 showed that many beneficial insects were eliminated from the plots after three applications of the materials that had been rated safest to use around these insects.

Yield data were taken from the test plots in both 1967 and 1968, but no statistically significant differences between treatments could be clearly demonstrated.

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TABLE 1. EFFECT OF INSECTICIDES APPLIED FOR PINK BOLLWORM CONTROL. IMPERIAL VALLEY, 1967

Material	lbs/ acre	Percentage of infested green bolls								
		8–29	9–19	9–25	10–1	10–7	10–13	10–19	$\bar{x}$	*
Guthion	0.5	13.5	10.0	5.5	3.5	5.0	3.0	4.0	6.4	a
Sevin	2.0	11.0	10.0	6.5	6.5	3.5	5.0	3.5	6.6	a
Azodrin	0.63	13.0	9.5	11.0	6.0	1.5	4.0	5.0	7.1	a
Methoxychlor	1.5	6.5	11.0	7.5	10.0	12.0	11.5	7.0	9.4	ab
Biothion	1.0	6.0	13.5	6.0	12.0	11.0	7.0	10.5	9.4	ab
Thiodan	1.0	18.0	14.0	15.5	15.5	10.5	8.5	7.5	12.8	b
Dylox	1.0	17.5	16.5	11.5	15.5	23.0	19.5	21.5	17.9	c

Treatment dates: 8–30, 9–6, 9–13, 9–20, 9–26, 10–2, 10–8, 10–14, 10–20 (+ defoliation).
* Means followed by the same letter are not significantly different at the 5% level.

TABLE 2. EFFECT OF INSECTICIDES APPLIED FOR PINK BOLLWORM CONTROL. IMPERIAL VALLEY, 1968

Material	lbs/acre	Percentage of Infested Green Bolls										
		8–8	8–14	8–20	8–28	9–4	9–12	9–18	9–26	10–2	10–9	x*
EP-333	1.0	4.0	7.0	4.0	2.0	2.5	0.6	1.5	1.8	0.5	0.6	2.5a
Sevin	2.0	3.0	11.0	5.0	4.0	1.5	1.5	0.5	2.0	0.0	1.0	2.9a
Gardona	1.0	1.5	9.5	8.0	2.5	4.5	1.1	4.0	5.0	1.5	3.8	4.1a
Biothion	1.5	7.0	10.5	9.0	3.0	4.0	1.5	2.5	2.3	1.0	2.8	4.4a
AC 47470	1.0/0.5†	9.0	10.5	10.5	4.0	7.5	5.7	8.0	9.8	8.5	5.8	7.9b
Thiodan	1.0	7.5	7.5	13.5	8.5	12.0	12.0	13.5	9.0	10.0	7.1	10.1bc
Oxy 2168	1.0	—	—	19.0	13.0	12.0	4.5	8.5	7.5	10.5	10.7	10.7c

Treatment dates: 8–2, 8–8, 8–15, 8–21, 8–26, 9–1, 9–8, 9–14, 9–23, 9–27.
* Means followed by the same letter are not significantly different at the 5% level.
† First 4 treatments at 1.0 lb/acre; remaining treatments at 0.5 lb/acre.