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## Sex-lure Traps

# Reduce Insecticide Treatments for Pink Bollworm

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For several years cotton growers in southern California have applied broad-spectrum insecticides on a regularly timed basis to control the pink bollworm, *Pectinophora gossypiella* (Saunders), from June through September. This preventative approach was necessary because growers lacked efficient methods for determining the abundance and activity of pink bollworm moths. Although this regime has provided effective control, repeated applications of insecticide have not only increased production costs, but also have destroyed many beneficial insects and further aggravated pest problems.

During the cotton growing seasons of 1971-73 extensive field investigations were conducted in the Imperial Valley on using moth densities to time the insecticide applications for optimal control. Moth populations were monitored with Hexalure-baited (sex lure for pink bollworm male moths), omnidirectional, 16-hole cone traps. In 1973 this program was expanded to include the Palo Verde Valley.

The traps, baited with fresh Hexalure every 15 days, were placed at a density of at least 1 per 20 acres, with a minimum of 2 traps per field. The traps, located at least 50 yards within the perimeter of each field, were kept level with the tops of the cotton foliage throughout the season.

### 1971-72 studies

In the Imperial Valley in 1971 traps were placed in 16 commercial cotton fields totaling 1700 acres. Each trap was checked daily and the number of male pink bollworm moths captured was recorded. The percentage of infested bolls per acre was determined weekly by collecting 25 susceptible bolls, about 12

to 24 days old, within a 25- to 30-yard radius of each trap and recording the number of larvae in them.

On nine of the fields, applications were made every 5 to 7 days from July 1 to September 5. The remaining seven fields in the same area were treated only when the daily catch equalled or exceeded an average of 3.5 to 4.0 moths per trap, in which case the field was treated within 24 hours.

The choice of insecticide and application rate was made by the individual grower or his pest control advisor. All applications were by airplane.

Similar tests were conducted from June 10 to September 1, 1972 on sixteen cotton fields (totaling 1020 acres), eight of which were treated on the basis of moth catches using the same sampling and application procedures as in 1971. The remaining eight fields were on a scheduled program.

### 1973 studies

In 1973 similar experiments were continued on eight fields (approximately 580 acres) in the Palo Verde Valley and eighteen fields (approximately 1150 acres) in the Imperial Valley. In each valley one-half of the fields were treated on scheduled programs and one-half on the basis of moth trap data. All fields were in close proximity to one another. Insecticide treatments in the Imperial Valley were started when an average of 3.5 to 4.0 moths per trap was reached after June 10, and then generally kept on a 6- to 7-day automatic treatment schedule until September 20. In the Palo Verde Valley the scheduled weekly applications were initiated on July 23 and continued to September 6. Before this period all fields in the Palo Verde Valley were

treated on the basis of moth counts. Sampling and application methods were the same as those used previously.

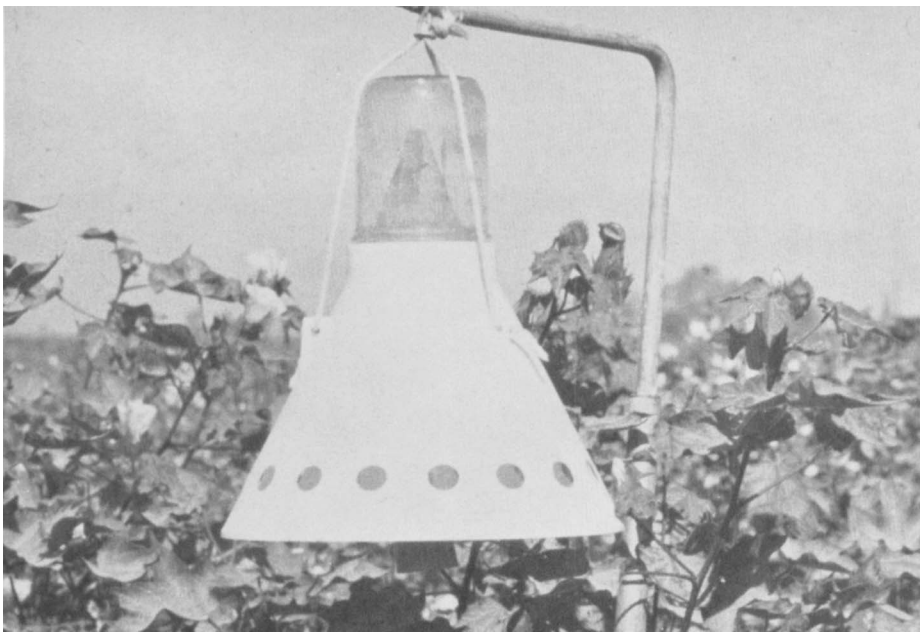
### Results

Fewer insecticide treatments were needed in cotton fields using the moth trap program than in fields on a preset schedule (see table). From July 1 to September 5, 1971, scheduled fields received an average of 9.4 treatments, with a boll infestation of 8.7 percent. Fields treated on moth counts received an average of 5.1 treatments with a 7.8 percent boll infestation. Thus, insecticide treatments were dramatically reduced with no increase in boll infestations.

In 1972 the trapping program resulted in 3.8 fewer applications than the scheduled treatment program, with no significant difference in boll infestations (see table). Both trap and scheduled fields averaged yields of 2.6 bales per acre.

From June 10 to September 20, 1973, the Imperial Valley's scheduled fields received an average of 12.3 treatments while only eight applications were required for the trap fields. Cotton fields on scheduled and trap programs had an average boll infestation of 3.9 percent and 4.7 percent, respectively. The trap fields had 4.3 fewer treatments than the schedule fields with no significant differences in boll infestations or cotton yields (see table). Also, since over one-half (4.2) of the applications were for pests other than the pink bollworm, treatments required for pink bollworm control actually were less than indicated by the 4.3 difference. However, it was necessary to record the total number of treatments, since all insecticides used will reduce pink bollworm populations.

In the Palo Verde Valley the four fields on the trap program from July 23



Omnidirectional cone trap.

to September 6 required an average of six treatments and had a boll infestation of 6.8 percent. The four fields on the scheduled program had an average of 9.5 treatments for the same period, with a 6.4 percent boll infestation. There was no significant difference in yields between the two programs.

There are disadvantages in the male moth trapping program: traps must be checked daily; insecticides must be applied within 24 hours or infestations may still occur; and trap catches may be affected by wind or rain, if it occurs at the period of peak activity of the moth. However, the trapping program does offer the following advantages: reduced costs for insecticides and applications; less chance of causing outbreaks of other pests; and, with fewer applications, a reduced likelihood of developing insecticide-resistant insects.

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TABLE. COMPARISON OF TWO DIFFERENT INSECTICIDE TREATMENT PROGRAMS FOR THE CONTROL OF PINK BOLLWORM ON COTTON IN THE IMPERIAL AND PALO VERDE VALLEYS OF CALIFORNIA, 1971-73. ALL VALUES BELOW ARE MEANS<sup>a/</sup>.

	Scheduled treatments <sup>b/</sup>	Treatments on moth catches
Imperial Valley - 1971		
No. of all treatments	9.4 a	5.1 b
Infested bolls (%)	8.7 a	7.8 a
Imperial Valley - 1972		
Field size (acres)	68.6 a	71.4 a
No. of all treatments	10.9 a	7.1 b
Infested bolls (%)	15.8 a	14.3 a
Yield of lint/acre (500 lb. bales)	2.6 a	2.6 a
Imperial Valley - 1973		
Field size (acres)	63.3 a	64.3 a
No. of treatments for pink bollworm	12.0 a	3.8 b
No. of treatments for other insects	0.3 a	4.2 b
No. of all treatments	12.3 a	8.0 b
Infested bolls (%)	3.9 a	4.7 a
Yield of lint/acre (500 lb. bales)	2.6 a	2.7 a
Palo Verde Valley - 1973		
Field size (acres)	72.0 a	71.8 a
No. of all treatments	9.5 a	6.0 b
Infested bolls (%)	6.4 a	6.8 a
Yield of lint/acre (500 lb. bales)	2.2 a	2.2 a

a/ Means in the same row followed by the same letter are not significantly different at the 5% level (Student's t-test).

b/ In the Palo Verde Valley, the weekly schedule treatments were initiated July 23 and continued to September 6. Before this period the fields destined for the schedule program were treated on moth catches.