Filbertworm Control Trials

two new insecticides tested on Payne, Franquette and Hartley walnuts in two experimental orchards in northern California

Arthur H. Retan, George R. Post, Clarence S. Davis, and A. E. Michelbacher

The intensity of the filbertworm infestation of walnuts in northern California in 1957 was less than in the peak year of 1954, but it marked the fourth straight year that the filbertworm has presented a problem. Based on past history the 1957 attack was surprising because observations have indicated that the pest would not continue at a highly destructive level over a period of several years.

The filbertworm occurs throughout the walnut producing sections of northern California but, apparently, it is most destructive in the Sacramento Valley. During 1957 it was encountered in a number of experimental orchards outside of the main zone of trouble. The infestations beyond the main trouble area would not be too annoying by themselves, but they help to create a problem when the damage done is combined with that caused by the codling moth and the navel orangeworm. This is true even though the filbertworm infestation apparently runs less than 1% of the crop.

Experiments to control the pest with two new insecticides, Guthion—0, 0-Dimethyl S-(4-oxo-1,2,3-benzotriazinyl-3-methyl) phosphorodithioate—and Sevin—N-methyl-1-naphthyl carbamate—were undertaken in two orchards near Gridley. In one orchard—planted to Payne and Franquette varieties—bait pan records have been kept over the past four years. The second experimental orchard was planted to the Hartley variety.

Because the filbertworm is unable to attack walnuts until the husks begin to split, no treatments were applied until just before the nuts reached that stage of development. In the Payne-Franquette orchard applications were made with an air carrier sprayer, while the treatments in the Hartley orchard were applied with a conventional sprayer. In both orchards treatments were applied on August 20, and in the Payne-Franquette orchard a second series of plots was treated with Guthion on September 4. All the treatments were replicated several times.

In the Payne-Franquette orchard, the Payne trees received two sprays to control the codling moth so the infestation given in the table in column 2 primarily represents that caused by the filbertworm. Guthion and Sevin treatments applied on August 20 resulted in rather effective control of the filbertworm when compared with the untreated check. However, the Guthion treatment applied on September 4 apparently had no suppressing influence upon the filbertworm.

Control of the filbertworm in the Hartley orchard, while promising, was not as good as that obtained in the Payne-Franquette orchard.

Based upon the results of a single season's investigation, both Guthion and Sevin look very promising in the control of the filbertworm. It is obvious from the work completed that timing of application is very important. In another season special emphasis will be placed on this phase of the problem and investigations with both insecticides will be expanded.

Until additional information on chemical control is available, cultural meas-

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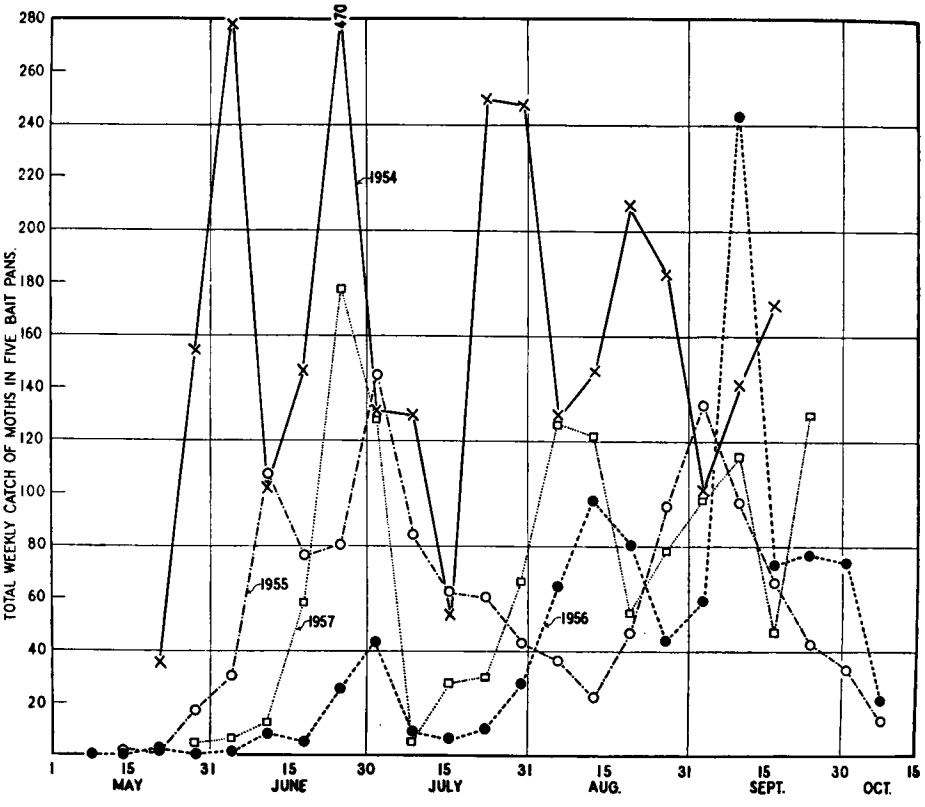
Control Tests for Filbertworm on Payne and Franquette Walnuts

Treatment applied by air carrier sprayer	Date applied	Infested nuts in harvested crop	
		Payne	Franquette
		%	%
Guthion 15% W.P. 10 lbs/250 gal water/acre	Aug. 20	2.75	1.11
Guthion 15% W.P. 10 lbs/250 gal water/acre	Sept. 4	13.66	3.70
Sevin 50% W.P. 12 lbs/250 gal water/acre	Aug. 20	2.27	2.25
Check		14.40	4.50

Control Tests for Filbertworm on Hartley Walnuts

Treatment applied with conventional sprayer	Date applied	Infested nuts in harvested crop
		%
Guthion 15% W.P 2½ lbs/100 gal water; 25 gal/tree (27 trees/acre)	Aug. 20	8.10
Sevin 50% W.P. 3 lbs/100 gal water; 17 gal/tree (27 trees/acre)	Aug. 20	13.33
Check		23.60

Trapping records of filbertworm moths in a walnut orchard near Gridley, California.



Turf Invasion by Weedy Grasses

weed-free plots of Merion bluegrass turf used in study of factors favoring invasion by crabgrass and common bermuda

John H. Madison, Jr.

Irrigation practices and mowing heights were found to affect invasion of turf by weedy grasses in a two-year study conducted at Davis involving 36 test plots and nine combinations of treatment, replicated four times.

The study was initiated in 1955 on a 60′ × 60′ area of weed-free Merion bluegrass divided into 10′ × 10′ plots by ridges for flood irrigation.

Crabgrass and common bermudagrass were chosen as the experimental weeds for the study.

A 5′ × 5′ frame was set in the middle of each plot to serve as a planting guide. Two 2″ plugs of bermudagrass sod were planted in the northwest and in the southeast corners of the frame. In the other two corners, one gram of hulled bermudagrass seed was sown over an area of one square foot. Along the north and south sides of the frame 0.4 gram of crabgrass seed was planted in another one square foot space.

The seed was sown April 27 and the plots were fertilized the following day.

To give the seed time to germinate the plots were kept well watered for three weeks—until May 17—before differential watering was started. Thereafter the plots were irrigated by flooding three times weekly—wet treatment—by flooding and soaking at incipient wilting—dry treatment—and by flooding and soaking at one half the time to incipient wilting—intermediate treatment. This schedule amounted, in general, to watering the intermediate plots about every 9–10 days, and the dry plots every 18–20 days.

The plots had been differentially mowed from the beginning with each plot maintained at one of three heights—½″, 1″, or 2″—by mowing two times a week.

Nine combinations of watering and mowing were replicated four times in the 36 plots. Each year each plot received fertilizer—containing one pound of actual nitrogen per plot—in five applications between March and October until the experiment was terminated in January, 1957.

The count of the crabgrass plants the first year was made too late to give a full picture of the coverage because the plants had rotted back to a crown. In 1956 the plants were counted by various methods. The results were basically the same whether the number of plants was counted, or the area covered by crabgrass was measured, or other means were used. More plants were counted in early July than survived until October, but the proportions were the same. The table in this column shows the number of plants at the end of the season. Each figure presented is the sum of the plants from the four replications of the same treatment. The plants were counted in an area of 25 square feet, in the middle of each plot. When statistical tests were applied to the data, considerable variation was found to be due to the chance location of the plots in the field.

Number of Crabgrass Plants Surviving Under Various Treatments

Each figure is the sum of the plants in 25 sq. ft. in each of four plots, Nov. 20, 1956.

Mowing height	Irrigation treatment			
	Wet	Intermed.	Dry	Total
½″	139	120	74	333
1″	36	59	15	110
2″	0	3	0	3
Total	175	182	89	446

The effect of height-of-cut was highly significant, as indicated by the fact that the crabgrass was almost eliminated at a height-of-cut of 2″. However, the effect of the various irrigation practices was seasonal. In the early summer—July—the effect of the most frequent irrigation was to cause a significant increase in the number of crabgrass plants present which was probably due to the increased germination of seed with increased moisture. When the mature plants were counted later in the season, irrigation practice showed no appreciable effect on the number of surviving plants. It is not uncommon to find several hundred crabgrass seedlings in a square foot of lawn in June, of which only one or two will survive until August.

The findings of this study indicate that the number of small young plants was a result of both irrigation frequency and height-of-cut, but that the number of plants surviving to maturity and producing seed was principally a result of the height-of-cut.

The relative area bermudagrass occupied in the plots at the end of 1956 increased as water was increased. The difference is statistically highly significant. However, the differences due to height-of-cut could well be due to field variation.

Relative Extent of Bermudagrass Invasion Under Various Treatments

Each figure represents the number of square feet of bermudagrass in a 100 sq. ft. sample taken 25 sq. ft. from each of 4 plots.

Mowing height	Irrigation treatment			
	Wet	Intermed.	Dry	Total
½″	44	27	23	94
1″	38	25	19	82
2″	42	34	23	99
Total	124	86	65	275

There was one aspect—density of the turf—of bermudagrass invasion that did not appear in the data and therefore was difficult to evaluate because different figures were obtained when the invasion was measured by different methods. In the plots mowed at ½″ the bermudagrass formed a solid tight mat. Mowed at 2″, the mat was more open and Merion and bermudagrass were intermingled. In the winter, the ½″ and 1″ plots had well defined brown areas of bermudagrass. But at 2″, the brown areas were overshadowed by the intermingling green.

John H. Madison, Jr., is Assistant Professor of Landscape Management, University of California, Davis.

The above work was done with the cooperation of Robert M. Hagan, Professor of Irrigation, University of California, Davis.

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ures must be relied upon to limit damage caused by the filbertworm. The crop should be harvested as soon as possible after the husks begin to crack and—because the filbertworm is unable to complete its development on dried walnut meats—the crop should be thoroughly dried as soon as harvested.

Arthur H. Retan is Farm Advisor, Butte County, University of California.

George R. Post is Farm Advisor, Sutter County, University of California.

Clarence S. Davis is Extension Specialist in Entomology, University of California, Berkeley.

A. E. Michelbacher is Professor of Entomology, University of California, Berkeley.