EGYPTIAN ALFALFA WEEVIL

. . . *chemical control*

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UNTIL NEW OR IMPROVED CONTROL procedures can be found, growers of alfalfa in California have little choice but to depend on chemical insecticides for control of both the alfalfa weevil, *Hypera postica* (Gyllenhal), and the Egyptian alfalfa weevil, *H. brunneipennis* (Boheman), where these species occur in damaging numbers.

Trials conducted through the 1965 season indicated that the likelihood was remote for replacing the formerly recommended, and highly effective cyclodiene insecticides (such as heptachlor or dieldrin) with newly developed insecticides which also could be applied in the dormant season. Attention has since been focused on the use of formulations applied as sprays to the growing crop in the spring, for control of the weevil larvae. Chemical control experiences reported here began with the 1966 season. For present recommendations see Leaflet 85, U. C. Pest and Disease Control Program for Alfalfa Hay, available from local farm advisors.

All tests were applied with a truck-mounted boom sprayer having an effective swath width of 20 ft, and delivering 15 gallons of finished spray per acre at 40 psi pressure. Field plots were 20 ft wide 60 to 100 ft long, and replicated four times in a randomized complete block design. Sampling for weevil larvae was conducted periodically after spraying by sweeping with a standard insect net.

Susceptibility

Experiences to date indicate no perceptible difference in the susceptibility of the alfalfa weevil to insecticidal sprays, as compared with the Egyptian alfalfa weevil. Materials effective against one species were just as effective against the other. Tables 1 through 3 give the comparative effectiveness of some of the more common insecticides used against the larva of the alfalfa weevil and the Egyptian alfalfa weevil.

Of the newer experimental compounds still under development by industry, the performance of Furadan was excellent (tables 2, 3) both in terms of initial larval kill, and persistence of activity. A comparison of several formulations of Furadan showed no difference in effectiveness between the wettable powder and the flowable preparations (table 3); however the 8-oz rate was slightly superior to the 4-oz per acre rate when applied to control an increasing larval population (table 2).

Applications of Furadan made approximately one week before the normal spraying date performed about as well as those made one week later (table 2). The "normal" date was found to be not necessarily the "optimum" spraying date—based on the knowledge that with the short-residual insecticides now recommended, only two to three weeks of protection can be expected from a single application. Some early-season damage must often be sustained before treatment with currently recommended materials, otherwise the insecticide will not remain effective to harvest.

A number of other experimental compounds evaluated for alfalfa weevil or Egyptian alfalfa weevil larval control are no longer under active development by industry. Most of these were not superior to insecticides now being recommended and none was superior to Furadan.

Integrated control

Much research is needed before an effective chemical control program can be incorporated into an integrated control scheme. Such a program should eventually involve the joint and compatible use of biological agents and suitable alfalfa varieties and management practices, as well as chemicals. For the present, growers must depend on short-residual sprays to depress increasing larval populations.

Since populations of Egyptian alfalfa weevil larvae in the Central Valley frequently are higher than those of alfalfa weevil larvae in the northern mountainous counties, sprays in the Central Valley often must be applied earlier, in relation to the expected first cutting date. This means that a single spraying sometimes is not sufficient to protect the crop until harvest. Many Valley growers applied sprays several times before the first cutting in 1970. However, the relatively low value of alfalfa hay places severe economic restrictions on hay growers faced with the need for plant protection measures. It is hoped that an integrated approach to weevil control including biological control and alfalfa crop management will result in depressed populations which can be economically controlled with a suitable chemical insecticide when necessary.

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TABLE 1. EVALUATION OF REGISTERED INSECTICIDES APPLIED APRIL 4, 1966 FOR CONTROL OF THE EGYPTIAN ALFALFA WEEVIL, TEHAMA COUNTY

Material	Active toxicant	Larvae/10 sweeps after: 8 days	16 days
	lbs/acre	Avg* no.	
Guthion	0.5	15 a	23 a
Ethyl Parathion	0.375	32 ab	29 ab
Alfa-Tox†	0.2 (diazinon)+ 0.4 (methoxychlor)	32 b	25 ab
Malathion	1.0	35 b	42 b
Methoxychlor	0.75	47 b	32 ab
Untreated	–	616 c	105 c

* Means followed by the same letter are not significantly different at the 5% level, according to Duncan's multiple range test.

† A commercial mixture containing 0.8 lbs. diazinon and 1.6 lbs. methoxychlor per gallon.

TABLE 2. EVALUATION OF INSECTICIDES FOR CONTROL OF THE LARVA OF THE ALFALFA WEEVIL, SISKIYOU COUNTY, 1967

Material*	Active toxicant	Larvae/10 sweeps on: June 6	June 15
	oz/acre	Avg no.	
Furadan‡	4	4 ab†	15 b
Furadan‡	8	2 a	13 a
Furadan	4	29 ef	64 f
Furadan	8	6 c	19 bcd
Velsicol VCS-506	16	4 bc	20 bc
EPN	8	7 bc	38 def
Supracide	8	11 d	38 cdef
Methyl Parathion	6	17 de	51 ef
Ortho 5305	12	44 fg	53 ef
Ortho 5305	16	26 e	25 bcde
Mobam	16	71 gh	181 g
Shell Dev. 14045	2	95 h	147 g
Shell Dev. 14045	4	88 h	210 g
Shell Dev. 15465	2	122 hi	181 g
Shell Dev. 15465	4	85 h	169 g
Shell Dev. 15465	8	67 gh	147 g
Carbaryl	16	118 hi	208 g
Untreated	–	189 i	252 g

* All applied May 31, 1967, except those footnoted otherwise.

† Means followed by the same letter are not significantly different at the 5% level, according to Duncan's multiple range test.

‡ Applied May 22, 1967.

TABLE 3. EVALUATION OF INSECTICIDES FOR CONTROL OF THE LARVA OF THE ALFALFA WEEVIL, SAN JOAQUIN COUNTY, 1968

Treatment†	Active toxicant	Larvae/10 sweeps after: 3 days	7 days	14 days	21 days
	lbs/acre			Avg no.	
Furadan—WP	0.5	14	30 a*	5 a	2 a
Furadan—Flowable	0.5	19 a	23 a	4 a	3 a
Methyl Parathion—EC	0.5	24 ab	31 ab	15 b	15 b
Zolone—EC	1.0	63 bc	47 ab	40 c	26 c
Velsicol VCS 506—EC	1.0	82 c	58 bc	44 c	37 cd
Velsicol VCS 506—EC	0.5	105 c	127 cd	126 d	70 d
Diazinon—EC	0.75	87 c	151 d	112 d	63 d
Untreated	–	304 d	514 e	421 e	212 e

* Means followed by the same letter are not significantly different at the 5% level, according to Duncan's multiple range test.

† Applied March 21, 1968. WP = wettable powder. EC = emulsifiable concentrate.