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scouting for
and managing the

alfalfa weevil

The alfalfa weevil^a is the most destructive insect pest on alfalfa in Iowa. Alfalfa weevils are found throughout the state but are most damaging in southern and northeastern counties.

Description

Larvae have green, legless bodies with a distinct white stripe down the middle of the back and a black head (figure 1). Full-grown larvae are $\frac{3}{8}$ -inch long.

Adults are brown snout beetles, $\frac{1}{4}$ -inch long with a black stripe extending partially down the back (figure 2).

Life Cycle

Alfalfa weevils only have one generation per year. Activity is usually limited to first-cutting alfalfa and regrowth of the second cutting.

Adults deposit eggs in alfalfa stems. In southern Iowa, some eggs are laid in the fall and during mild winter days. Eggs are laid in the spring in both southern and northern Iowa. Fall- and winter-laid eggs hatch in late April while spring-laid eggs hatch in early to mid-May.

The larvae hatch from eggs. They molt four times and require 4 or more weeks to complete development. The fourth instar larvae pupate in net-like cocoons which are attached to leaves on the plant or in soil litter.

Adults emerge from the cocoons and feed for a few weeks before leaving the

^a*Hypera postica* (Gyllenhal)

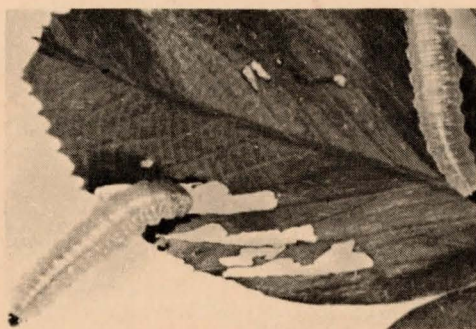


Fig. 1. The alfalfa weevil larva is green with a black head.



Fig. 2. The adult alfalfa weevil is a snout beetle about $\frac{1}{4}$ -inch long.

alfalfa to enter summer dormancy in sheltered sites along fence rows, ditches, or vegetation bordering fields. In the fall, adults return to alfalfa fields where they feed, mate, and sometimes lay eggs. Adults overwinter in the soil around alfalfa crowns.

Damage

Feeding damage is caused primarily by the larval stage. Damage is limited to the first cutting and regrowth of the second cutting. Larvae damage alfalfa by eating

holes in leaves. Leaves can become skeletonized, dry, and brittle with prolonged and heavy larval feeding. Heavily infested fields can take on a frosted appearance. Feeding larvae may completely defoliate stems and kill growing terminals. Larval damage is usually earlier and more severe in southern Iowa.

When newly emerging adults and surviving larvae remove shoot growth after first cutting, root food reserves can be depleted and the next cutting delayed. Adults also can damage alfalfa after first cutting by scraping the green surface layer from the stems.

Scouting

A precise sampling method utilizes degree day accumulations, plant height, and the number of larvae per stem. Temperature controls the activity and development of the alfalfa weevil. Start scouting alfalfa when 300 degree days have accumulated after January 1, using a base temperature of 48°F (8.9°C). The ISU Cooperative Extension Service can be contacted for degree day information. Collect 30 stems at random per field and place them in a bucket. Record the stem length of 10 out of the 30 stems. Count the number of larvae on the 30 stems. Larvae can be dislodged from the stems by shaking the stems in the bucket.

Sample fields in a random pattern to provide a representative sample; avoid sampling field margins. Break stems at

the base taking care not to jerk the stem and dislodge the larvae.

Decision

Treat alfalfa only if the field cannot be cut within 5 to 7 days. Tables 1 and 2 give thresholds, sampling intervals, and suggested recommendations to resample, spray, or harvest. The alfalfa weevil management recommendations are based on degree day accumulations, plant height, and number of larvae per 30 stems.

If green-up does not occur within 3 to 5 days after first cutting, a stubble treatment should be made to control the surviving larvae and newly emerging adults.

Recommended Controls

An alfalfa weevil management program should incorporate a variety of practices to enhance alfalfa production and lessen damage. Planting tolerant varieties, maintaining fertility, early cutting, introducing parasites, and using insecticides are practices which can be incorporated into an alfalfa production system that will help reduce alfalfa weevil damage.

Arc, Gladiator, and Weevilchek are varieties which show some tolerance to larval feeding and may be integrated into present alfalfa production systems. Proper fertility also will lessen the impact of larval feeding because stands are more vigorous.

Alfalfa near maturity should be cut rather than treated. Early cutting may replace the need for chemical treatment because larvae are destroyed.

Biological agents, such as parasitic wasps, will help suppress weevil populations. Parasitic wasps which attack adult and larval alfalfa weevils have been released in Iowa. The unnecessary use of sprays reduces parasite populations. Insecticide applications are most hazardous for alfalfa weevil parasites from May 1 to May 10. Avoid treating during this period if possible.

Insecticides recommended for alfalfa weevil control are given in table 3. Apply

Table 1. Alfalfa weevil pest management recommendations—Number of larvae collected from a 30-stem sample.^a

Total degree days (dd)	Alfalfa height (inches)																
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 or more
290-310																	
Spray		25	37	52	67	75	83	94	105	105	105						
Resample in 50 dd		0-24	0-36	0-51	0-66	0-74	0-82	0-93	0-104	0-104	0-104						
340-360																	
Spray					82	82	82	82	82	82	82	82	82	82	82		
Resample in 50 dd					14-81	14-81	14-81	14-81	14-81	14-81	17-81	17-81	17-81	17-81	17-81		
Resample in 100 dd					0-13	0-13	0-13	0-13	0-13	0-13	0-16	0-16	0-16	0-16	0-16		
390-510																	
Spray										52	52	58	64	68	72	76	80
Resample in 50 dd										8-51	8-51	8-57	14-63	14-67	14-71	18-75	18-79
Resample in 100 dd ^b										0-7	0-7	0-7	0-13	0-13	0-15	0-17	0-17
540 to harvest	(see table 2)																
100 after harvest																	
Spray	23	33	43	48	53	58	63										
Resample in 50 dd	17-22	17-32	17-42	20-47	23-52	23-57	23-62										
Resample in 100 dd ^c	0-16	0-16	0-16	0-19	0-22	0-22	0-22										
150 or more after harvest	(see table 2)																

^aFrom University of Illinois Circular 1136.

^bIf this field was sprayed more than 7 days ago, you can wait 200 degree days to resample.

^cIf last preharvest sample had less than 30 larvae, the weevil season is over and you can quit sampling.

20 gallons finished spray per acre at approximately 20 to 30 pounds pressure per square inch by ground rig application. Apply 3 to 5 gallons per acre by aerial application. Single treatments are usually sufficient for control. **Do not treat** blooming alfalfa or weeds in bloom which are attractive to honeybees. Do not allow sprays to drift into weeds in bloom or near hives. Alert beekeepers at least 24 hours and not more than 72 hours prior to application if insecticides toxic to bees are to be sprayed within 2 miles of beehives. Do not treat unless the material has enough time to dry before rain. At temperatures less than 65°F, some insecticides may not be effective. Observe safe harvest and grazing intervals listed on the label.

Table 3. Insecticides recommended for alfalfa weevil control.

Insecticide	Rate lb. a.i. ^a /acre	Harvest interval (days)
Alfa-tox	2-3 (qt)	7
*Furadan 4F	0.25-0.5	7-14
Imidan	1	7
*Lannate	0.9	7
Malathion-methoxychlor	1.0-1.5 (each)	7
*Nudrin	0.9	7
*PennCap-M	0.5	15
Sevin XLR	1.0-1.5	0
Supracide	0.5-1.0	10
Commercial Applicators		
*Guthion	0.5	16
*Ethyl or methyl parathion	0.5	15

*Restricted-use pesticide. Treatments to be made with these insecticides only by certified applicators or individuals working under their direct supervision.

^aa.i. = actual insecticide

Table 2. Alfalfa weevil pest management recommendations.^a

Total degree days (dd)	Change in number of larvae since last sample		
	Decreased 10 or more	Within 10	Increased 10 or more
540 to harvest			
Spray or harvest	73	63	53
Resample in 50 dd	23-72	18-62	13-52
Resample in 100 dd ^b	0-22	0-17	0-12
150 or more after harvest			
Spray	78	58	48
Resample in 50 dd	28-77	18-57	0-47
Quit sampling	0-27	0-17	

^aFrom University of Illinois Circular 1136.

^bIf sprayed more than 7 days ago, you can wait 200 degree days to resample.

File: Pest Management 1

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