PENNSTATE
College of Agricultural Sciences • Cooperative Extension
Entomological Notes
Department of Entomology

ALFALFA WEEVIL

Hypera postica Gyllenhal

Alfalfa weevil is one of the two most-damaging insect pests of alfalfa in Pennsylvania (the other is potato leafhopper). It is an exotic species that likely evolved in Asia, but appears to have been introduced to the United States at least three times. As an exotic species, it is attacked by few natural enemies native to the United States; therefore, an effort was made to introduce from its native range parasitic wasps that kill its larvae. Some of these parasitoid species have done a good job controlling weevil populations in parts of the eastern United States and as a result chemical controls are rarely necessary. In Pennsylvania, the role of parasitoids in controlling alfalfa weevil populations is unclear and this assessment remains to be done. What is clear, however, is that economically damaging populations of alfalfa weevil do occasionally build up in Pennsylvania alfalfa fields.

Figure 2. Alfalfa weevil adult

DESCRIPTION

Newly hatched alfalfa weevil larvae are tiny and yellowish green with black heads. Older larvae also have black heads, but transition to more of a green color (Fig. 1). Larvae have a distinct white line down the center of their backs and more subtle white lines along each side (Fig. 1). Adult weevils are about a quarter inch (5-7 mm) long and light brown with a broad darker stripe extending down their midline (Fig. 2). Being weevils, they have a distinct narrow beak or rostrum extending in front of their heads (Fig. 2). Their chewing mouthparts are at the tip of this rostrum.

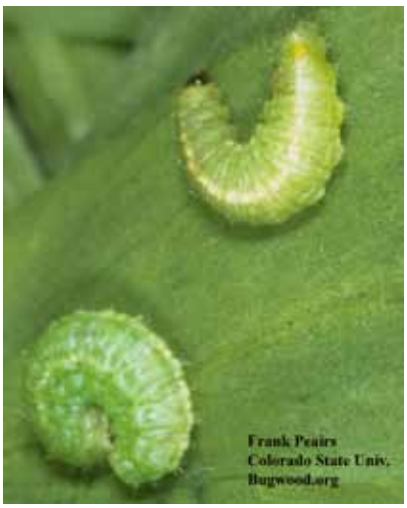

Figure 1. Alfalfa weevil larvae

LIFE HISTORY

Adult weevils overwinter and when temperatures warm up in spring they chew holes in alfalfa stems, where they will lay their eggs. These eggs will hatch in about 200-250 Fahrenheit degree days and newly hatched larvae will move to terminal leaves where they will feed causing small holes. Older larvae will feed on unfurled leaves and complete larval development takes about three weeks. Most mature larvae drop to the leaf litter and spin silken cocoons, emerging as adults in 7-10 days. Adults also feed on alfalfa, but do not appear to cause much damage. Adults leave fields when summer temperatures begin to increase and spend warm months in a type of hibernation.

DAMAGE

Alfalfa weevil larvae defoliate plants and their feeding reduces yield, quality, and stand health (Fig. 3). Weevil damage is typically concentrated on the first cutting of alfalfa (in most years, weevil larvae are out of fields by mid-June), but the impact of weevils on the first cutting can negatively influence vigor of the second cutting. Alfalfa weevil damage typically occurs as farmers are planting corn, so it can be easy to ignore. A density of one larva in thirty twelve-inch-tall plants has been estimated to reduce yield by about 3 lbs per acre. It is important to realize

Figure 3. Alfalfa weevil damage to first cutting alfalfa plant.

that the negative impact of alfalfa weevil on yield decreases with plant height; therefore, one larva in thirty sixteen-inch-tall plants translates to a loss of approximately 0.75 lb per acre.

MANAGEMENT

Alfalfa weevil does not reach economically damaging levels every year, so growers will need to rely on scouting to determine if their fields contain significant weevil populations. A useful tool for determining when to start scouting in Pennsylvania is the alfalfa weevil map on the PA-PIPE system (http://cas.psu.edu/spotlight/pa-pipe.html). PIPE stands for "Pest Information Platform for Extension & Education." The PA-PIPE is an effort funded by Penn State's College of Agriculture to predict pest populations. Growers can check this continuously updated site to see how the population may be developing in their area of the state and then base their scouting off these model-based predictions.

Economic thresholds for alfalfa weevil are determined from the size of plants, the value of the hay, the cost of insecticidal treatment, and the number of larvae per 30 stems of alfalfa (Table 1). Using a sweep net will tell you if weevil larvae are present in fields, but to sample weevil larvae for determining their populations relative to threshold levels, you need to pick some stems. Systematically select 30 stems from across a field, break them off gently (to avoid losing any larvae prematurely), and shake them into a bucket. If the number of larvae exceeds the numbers in Table 1, growers should consider a management tactic. If alfalfa is tall enough, harvest can be a good control option. Once plants reach sixteen-inches in height, harvesting the crop is usually preferable to chemical treatments. An added benefit of early harvest is that it conserves beneficial organisms that would likely be killed by insecticidal treatment. Should a chemical treatment be needed, many compounds are available for controlling alfalfa weevil. See Penn State's Agronomy Guide for details (http://agguide.agronomy.psu.edu/).

Economic Threshold for Alfalfa Weevil

Number of Larve/30 stems

Value of Hay ($/ton)	Plant Height (inches) 12 to 18				18 to 24				24 to 30			
	$12	$14	$16	$20	$12	$14	$16	$20	$12	$14	$16	$20
120	68	79	91	114	75	87	100	124	78	91	105	130
140	59	68	77	99	64	75	86	107	67	78	90	112
160	51	60	68	86	56	65	75	93	58	68	79	98
180	45	53	60	77	50	58	67	84	52	61	70	87
200	41	48	54	69	45	52	60	76	47	55	63	79
220	37	43	49	63	41	47	55	69	42	50	57	72
240	34	40	45	58	37	43	50	63	39	46	53	66
260	31	37	42	54	35	40	46	59	36	43	49	61
280	29	34	39	50	32	37	43	55	33	40	45	56
300	27	32	36	47	30	35	40	51	31	37	42	53
320	26	30	34	44	28	33	38	48	29	35	40	49
340	24	28	32	41	26	31	36	45	27	33	37	46
360	23	26	30	39	25	29	34	43	26	31	35	44
380	22	25	28	37	24	27	32	41	24	29	33	42
400	20	24	27	35	22	26	30	39	23	28	32	39

Cost of Insecticide & Application Per Acre

Table 1. Economic thresholds (# of larvae) for alfalfa weevil on plants of different sizes. If the number of weevil larvae from 30 stems exceeds the number in the table for plants of the appropriate height, the value of hay, and insecticide cost, a treatment may be warranted.

WARNING

Pesticides are poisonous. Read and follow directions and safety precautions on labels. Handle carefully and store in original labeled containers out of the reach of children, pets, and livestock. Dispose of empty containers right away, in a safe manner and place. Do not contaminate forage, streams, or ponds.

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Revised April 2013

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