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FACT SHEET

Agriculture and Natural Resources

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Alfalfa Weevil on Alfalfa

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Crop: Alfalfa
Crop Development: First Cutting (spring)
Scientific Name: *Hypera postica*

The alfalfa weevil (fig. 1) is a small, brown, snout-nosed beetle approximately 3/16 inch in length with a wide dark stripe down its back. The larva is green with a black head and a white stripe down its back. Larvae pass through four instars, with the 4th instar being about 3/8 inch in length. Both the adult and larvae feed on alfalfa foliage. Foliar feeding injury by the adult is not significant. Foliar injury by 1st and 2nd instars is primarily confined to the growing tips. Late 3rd and 4th instars may extensively defoliate alfalfa when abundant. In general, foliar injury by alfalfa weevil occurs on the first cutting of alfalfa (fig. 2). During periods of heavy weevil activity, early growth of the second cutting may be impacted.

In most of Ohio, the life cycle of alfalfa weevil begins with the adult, which is the predominant overwintering stage. In regions south of Ohio and possibly some southern Ohio counties, the egg stage of the weevil may survive the winter. In the spring, when temperatures begin to exceed 48°F, the adults become active and clusters averaging 9 to 10 eggs will be deposited into fresh alfalfa stems.

As heat units above 48°F accumulate, the eggs hatch and larval development proceeds through the four instars. The peak activity of 3rd instars from spring-

Figure 1. Alfalfa weevil stages

Figure 2. Alfalfa weevil feeding injury

deposited eggs occurs at 575 heat units as accumulated from January 1. In an area having overwintering eggs, an early peak of 3rd instars will appear at 325 heat units. When 4th instars reach maturity, they spin a fibrous net cocoon and transform into pupae, from which the adult stage emerges. The pupae become the predominant stage as accumulated heat units reach 800. In Ohio, the life cycle of the alfalfa weevil normally is limited to a single generation per year, but in an abnormal year, especially when high temperatures prevail in June, a second generation may develop.

Over the past few decades, populations of alfalfa weevil have seldom reached economic levels of abundance due to biological control by a complex of three parasitic wasps and a fungal pathogen. When an epizootic of the fungal pathogen, *Erynia sp.*, is present, late larvae of the weevil that are brown in color will be found attached to foliage. The combined effects of these biological parasites and fungal pathogens tend to regulate the abundance of alfalfa weevil populations to a point that the economic injury by the weevil on Ohio alfalfa is infrequent. However, observations suggest that these biotic agents are perhaps not as effective as in the past because we are now seeing significant defoliation of alfalfa where applications of a rescue treatment of insecticide are warranted.

Scouting

Application of an insecticide to prevent excessive defoliation is justified when one or more late instars are found feeding per stem and the stand cannot be harvested early. Because alfalfa weevil is usually controlled by beneficial wasps, which are susceptible to chemical treatments, it is important that treatments not be applied unless necessary.

The yield impact of weevil feeding declines as alfalfa stand height increases, and decisions to treat alfalfa for weevil should be focused on an alfalfa stand when larvae can be readily found on alfalfa that is 12 inches or less in height. Once alfalfa is 16 inches or more in height, early cutting is a preferred option for reduction of weevil impact.

The proportion of stems exhibiting tip feeding is an indicator of weevil abundance. Detection of 25% tip feeding on 6-inch alfalfa, 50% tip feeding on 9-inch alfalfa, or 75% tip feeding on 12-inch alfalfa indicates a potential problem. Since evaluation of tip feeding is rather variable among field personnel, the final decision to apply a foliar treatment should be based on an actual count of weevil larvae per stem.

A larval count should be based on a series of 10-stem samples randomly collected from various locations in a field. Each stem should be carefully picked off at the base and placed top down in a bucket. When 10 stems have been collected, the stems should be vigorously shaken in the bucket and the number of larvae collected in the bucket counted. The shaking will dislodge late 3rd and 4th instars, which cause most of the foliar injury. Close inspection of the stem tips may be needed to detect the early 1st and 2nd instars (fig. 3). The detection of one or more larvae per stem on alfalfa that is 12 inches or less in height indicates a need for rescue treatment. Where alfalfa is between 12 and 16 inches in height, the action threshold should be increased to 2 to 4 larvae per stem depending on the vigor of alfalfa growth.

Table 1. Action thresholds relevant to stand height, tip feeding, and density of larvae per stem.

Stand Height Inches	Indication of Problem % Tip Feeding	Problem Confirmation Larvae per Stem	Recommended Action
6	25	1	Recheck in 7 days
9	50	> 1	Spray
12	75	> 2	Spray or harvest
16	100	> 4	Harvest early
When harvested early due to weevil, check within one week for regrowth.			

Figure 3. Close-up of alfalfa tip with larvae

Management

Where alfalfa is 16 inches or more in height and multiple larvae are found per stem, early harvest should be considered. Following early harvest of infested stands, regrowth should be examined 4 to 6 days after harvest. If regrowth is being prevented by 2 or more larvae per crown, a stubble spray is warranted. In years when alfalfa weevil have been abundant on first cutting, the regrowth should be checked after cutting to make sure that new adults or larvae are not preventing the plant from regrowing.

Whenever weevil activity on an alfalfa stand is being evaluated, it is important that indicators of declining weevil activity be noted, such as the pupation of mature larvae or the decimation of a weevil population by an epizootic of the fungal pathogen. If few early weevil larvae are present in a sample and pupal cocoons are readily found on the foliage or on the ground, it may be assumed that the peak activity of larval feeding has passed. If diseased larvae are readily observed on the foliage, it may be assumed that additional larvae are infected and that a decline in feeding activity is occurring. Economic prevention of defoliation by a weevil population depends on timely treatment of an infestation prior to peak feeding activity. Treatment of a declining population will not likely achieve an economic return on the cost of an insecticide application.

See Ohio State University Extension Bulletin 545, *Control of Insect Pests of Field Crops*, for those insecticides labeled for alfalfa weevil, or for all insecticides labeled on alfalfa. Bulletin 545 can be accessed at http://entomology.osu.edu/ag/.

Additional information is available from your local OSU Extension office or The Ohio State University Entomology Agronomic Crops Insects web site (http://entomology.osu.edu/ag/).