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Scout first and then decide: Using economic thresholds for alfalfa weevils

by Marlin E. Rice, Department of Entomology

Scouting for alfalfa weevil larvae is not that difficult, although it takes several minutes when done properly. In any alfalfa field, I prefer to start my scouting with a sweep net. A sweep net and a quick and easy method of answering the question, "are there alfalfa weevil larvae in the field?" By taking 40-50 sweeps in an area, it can easily be determined if larvae are present or not. If larvae are found, then proceed to the stem-sampling technique, which is used to determine the economic threshold. Stem sampling can more accurately determine the population size and the potential for yield loss.

Collect 30 stems by holding the top of the plant with one hand and breaking the base of the stem with the other hand, or cut it with a knife. By holding the top of the stem, this prevents larvae from dropping from the stem when it is broken or cut at the base. Then place the stems (upside down) inside a white, 5-gallon bucket and beat them against the side. Large larvae are easily knocked loose and can be counted, but newly developing leaves in the terminal must be pulled apart to find very small, newly hatched larvae hidden in the plant tip.

Alfalfa weevil larvae can be recognized by a very dark head, which is almost black, and a pale green with a white stripe along the back. When the larvae hatch, they are approximately 1/16 inch in length and may be light yellow in color. After feeding for several days, they turn green. They are 5/16 inch in length when fully grown.

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Alfalfa weevil larva and damage to alfalfa leaf. (Marlin E. Rice)

Alfalfa weevil larvae may be confused with [larvae of the clover leaf weevil](#), although these are much larger, have a light brown head, and often have the white stripe edged with pink. Clover leaf weevil larvae usually hide around the base of the plant during the day, feed mostly in lower leaves at night, and rarely cause economic yield losses. Clover leaf weevil larvae should not be counted as part of the alfalfa weevil sample.



The economic threshold will go up if diseased larvae are found in the field. (Marlin E. Rice)

Measure the plant height and then determine the average number of weevil larvae per stem, based upon a 30-stem count, and then consult Table 1 for the economic thresholds. The economic threshold depends on crop height, estimated crop value, control costs, and the

growing conditions stated in Table 1. Use the smaller threshold if alfalfa is drought-stressed, or control costs are relatively low (\$7-10 per acre). Use the larger threshold if rainfall is abundant, diseased larvae are present, or control costs are relatively high (\$11-14 per acre). Several commonly available insecticides labeled for alfalfa weevils are listed in Table 2.

Table 1. Economic thresholds based on alfalfa weevil larvae per stem, calculated from a 30-stem sample.

Plant Height (Inches)	\$40/ton	\$70/ton	\$100/ton	Management Decision
4	1.8-2.8	0.8-1.3	0.6-0.8	Reevaluate in 4 days. If damage and larval numbers are increasing, a long-residual insecticide is recommended to prevent severe yield loss.
6	2.0-3.0	0.8-1.5	0.6-1.0	
8	2.2-3.2	0.9-1.7	0.7-1.2	
10	2.3-3.5	0.9-1.9	0.8-1.4	If alfalfa is in vegetative stages, a short residual insecticide should be used.
12	2.4-3.8	1.0-2.2	0.9-1.6	
14	2.5-4.2	1.2-2.5	1.0-1.8	
16	2.6-4.6	1.5-2.8	1.1-2.0	If >60 percent of alfalfa is in the bud stage, harvest is recommended. Evaluate stubble after harvest. If not scheduled to be cut within 7-10 days, a short-residual insecticide is recommended
18	2.7-5.0	1.7-3.1	1.2-2.3	
20	2.8-5.8	2.0-3.4	1.4-2.6	
>20	3.0-7.0	2.4-4.0	1.6-3.0	

Use the smaller threshold if alfalfa is drought-stressed, or control costs are relatively low (\$7-10 per acre). Use a larger threshold if rainfall is abundant, diseased larvae are present, or control costs are relatively high (\$11-14 per acre).

Table 2. Commonly available insecticides labeled for alfalfa weevil.

Insecticide	Rate per Acre (High and Low Rates)	Harvest Interval (Days)
Baythroid 2E	1.6-2.8 ounces	7
Furadan 4F	0.5-2 pints	7-28
Lannate LV	3 pints	0
Lorsban 4E	1-2 pints	14-21
Mustang Max	2.24-4.0 ounces	3
Pounce 3.2EC	4-8 ounces	0-14
Sevin XLR+	3 pints	7
Warrior	2.56-3.84 ounces	7

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