



# Meager-looking alfalfa weevil chews production and profits

## How can something so small do so much damage?

Alfalfa weevils are species of snout beetles about the size of a grain of rice (Fig. 1, page 7). However, the snout beetle (adult form) doesn't cause all the damage. The larvae form of alfalfa weevils are voracious feeders and defoliate alfalfa plants. The type of damage they cause to the leaves is known as skeletonization because they usually leave behind the ribs and veins of the leaves. Alfalfa weevils are considered the worst insect pest for Wyoming alfalfa hay fields. To control any pest, one must understand its biological life cycle and understand the appropriate timing for control.

### Alfalfa weevil life cycle

Wyoming alfalfa weevils have one complete lifecycle annually. Most adult alfalfa weevils overwinter in the leaf debris and crowns of alfalfa plants in a field or along field edges. Adults become active in the spring once average high temperatures warm above 48° Fahrenheit, which is a little warmer than alfalfa needs to start growing.

Female weevils are busy laying eggs during spring by chewing holes in new and dead alfalfa stems. They then deposit lemon-yellow colored eggs in clusters of 5 to 40 eggs inside these cavities. Each female can lay between 400 to 1,000 eggs a season.

Young larvae (approximately 1/20th of an inch) termed 1st instars, emerge from the stem and travel up to the growing buds of the plant where they feed inside the tightly whorled leaves (Fig. 2). As the plant grows, the leaves unfold exposing the larger weevil larvae (3rd to 4th instar stages) and the damaged leaves.

Once the weevil larvae complete the 4th instar stage of larval development, they drop from the canopy and move to the base of the plant and spin a cocoon to pupate, or change, into an adult beetle, which starts the life cycle over again.

There can be a time when the year-old beetles and newly emerged beetles overlap. The old beetles are dark, having worn off the shiny tan and brown scales (Fig. 3).

Adult snout beetles can be found within the alfalfa field or along the edges for the remainder of summer and cause minimal feeding damage that is not considered an issue. In the Midwest and Southern plains states, adult weevils will also become active in the fall and start depositing eggs. This could be happening in Wyoming during years with long, mild falls; however, survivability of eggs during the winter are considered very low, if at all.

### Management and control

The 3rd and 4th instar stage weevils do the most physical damage to an alfalfa plant, and this typically coincides just prior to or at first cutting of hay. The control of these larval stages is the most critical. An insecticide application is the most effective control option. This application is economical when population levels exceed the damage threshold, which is determined by the potential revenue loss (estimated by potential hay yield and quality loss and current price for hay) compared to the cost of the insecticide application.

The UW Extension publication *Alfalfa Weevil Biology and Management*, available at [bit.ly/alfalfaweevil-management](http://bit.ly/alfalfaweevil-management), can help derive this threshold. First determine the larvae per stem density of the field, then compare to chart 1 in the publication to get an estimated yield reduction if not controlled. One can easily estimate larvae per stem by sweeping alfalfa fields with an insect net or shaking stems into a 3-gallon bucket. For step-by-step sampling details, please see chart 2 in the publication.

Timing of the pesticide application is critical. Timing can be challenging because of coordination with the spray equipment, irrigation, harvest timing, and weather to still produce the best quality of hay.

Do not be fooled. Typically, one insecticide application does not kill all the alfalfa weevils in a field. Always

evaluate the success of a treatment by scouting after you can safely re-enter the field according to the pesticide label.

Most insecticide applications will only kill alfalfa weevils physically contacted by the spray or if they eat the treated leaves, which means larvae that are visible on stems and leaves.

Any young larvae still in the whorls of the alfalfa leaves and any weevils in cocoons are protected. Survivors can damage crop regrowth after the first cutting. This is why the timing of the application is important, to maximize the control of the weevil and stop the pest pressure for a short period of time, protecting the yields until harvest is completed.

Harvesting early is another control option typically attempted. The field is harvested and baled once the alfalfa weevil populations start to peak and prior to heavy skeletonized leaves. Most likely, this would coincide with a pre-bud or pre-bloom harvest, which typically creates a high-quality forage with slightly lower yields (dependent on crop maturity when populations peak). Another early harvest option is taking the first cutting as a haylage. This process would chop and ensile the alfalfa entirely from the field, which removes the weevils and their larvae from the field.

This management technique salvages what yields have currently been produced and produces a good quality hay product to sell. Similar to the insecticide application, this type of management typically does not disrupt the pest cycle enough to have lasting control on next year's pest pressure.

There have also been situations when early harvest is done for control and the second cutting was still severely infested with alfalfa weevil survivors. In Wyoming, having damaging levels of weevils in the second cutting could happen for either management option because a large portion of the weevils were possibly protected in the tips during harvest or treatment, or possibly due to insecticide resistance.

Alfalfa weevils are a challenging pest to control. It takes knowledge of their lifecycle, monitoring of the pest, correct timing of the control method, and a little bit of luck to have everything come together just right to minimize the impacts of this pest to hay fields.



**Fig 1.** These three snout weevils can be found in Wyoming alfalfa fields. The small one is the clover root curculio (*Sitona hispidulus*). Their damage to alfalfa is caused by the root-feeding larvae. The mid-sized alfalfa weevil (*Hypera postica*) is the most common pest of alfalfa and the leaf skeletonization caused by the larvae reduce yields and quality of the crop. Contributing to the damage are the much bigger clover leaf weevil (*Hypera punctate*). Its larvae are similar to alfalfa weevils, but have a light brown head and hide in the leaf litter at the base of plants during the day.



**Fig. 2.** A dead 1st instar alfalfa weevil larvae exposed from the tightly packed leaves of a plant next to pin and then placed next to an adult pea aphid (*Acyrtosiphon pisum*) for scale.



**Fig. 3.** The 1-year-old alfalfa weevil has worn off the tan and brown scales that cover the newly emerged specimen. They were collected in the same sample taken in late June before the first cutting of a field. The young adult will feed for a while on alfalfa and then go into dormancy in sheltered areas for the rest of the summer.

For more detailed information and control options, please refer to the UW Extension publication *Alfalfa Weevil Biology and Management*, B-983, [bit.ly/alfalfa-weevil](https://bit.ly/alfalfa-weevil).

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There's a good possibility **Jeremiah Vardiman** believes alfalfa producers would be a whole lot happier if alfalfa weevils took a permanent leave of absence. Vardiman is a University of Wyoming Extension educator based in Park County. He can be reached at (307) 754-8836 or at [jvardima@uwyo.edu](mailto:jvardima@uwyo.edu).