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Blister Beetle Management In Alfalfa

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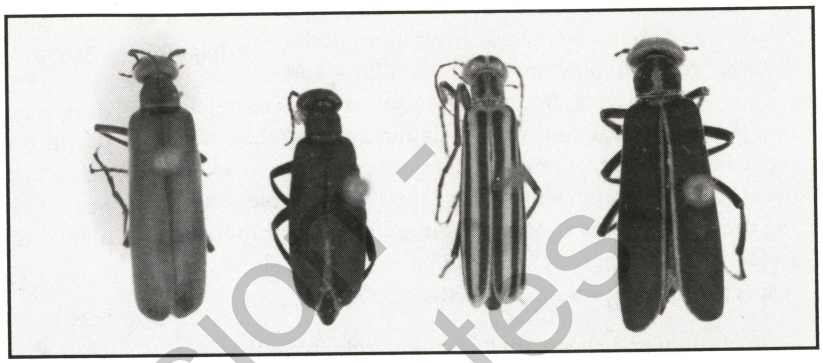
In Missouri, blister beetles are an infrequent pest of alfalfa. When present in sufficient numbers, however, the consequences can be serious. These insects cause only limited plant damage to alfalfa and soybeans.

But when ingested by livestock, especially horses, the animals may become sick and even die. These insects produce a highly toxic drug called cantharidin.



Four Important Blister Beetles: (left-to-right) The ashgray, black, striped, and margined blister beetles are important pests in Missouri alfalfa. Their toxin (cantharidin) kills horses if they eat enough contaminated hay. Scientists consider one miligram of toxin per kilogram of the horse's weight -- *lethal.*

Description and life history

Blister beetles are in the family Meloidae and are common throughout the United States. In Missouri, several species may be found feeding on alfalfa during the growing season.

These beetles range from 1/2 to 1 inch in length and are readily recognized by their characteristic shape; narrow, cylindrical, soft-body with a distinct "neck-like appearance" when viewed from above. Their colors range from black to gray to brown and some species have orange stripes. The striped blister beetle, *Epicauta vittata*, is most frequently associated with sickness in Missouri livestock.

Most blister beetle species have one generation per year. Females lay eggs in soil from late summer into early fall. Eggs are laid in clusters and hatch in about two weeks. The larvae move over the soil and find grasshopper eggs on which they feed. Larvae develop through several stages until in the last or next to last stage they form a thickened skin which will protect them during the winter. These larvae overwinter in the soil, pupate the following spring, and depending on the species, emerge from the soil in June, July, or August. Adults then feed, mate, and lay eggs for the next generation.

Infestations in alfalfa

Blister beetle problems traditionally have been associated with alfalfa from arid, western states where environmental conditions encourage frequent grasshopper outbreaks. Although not as common, alfalfa from more eastern states may experience blister beetle problems in years following heavy grasshopper infestations.

In Missouri, few if any blister beetles are present in the first cutting of alfalfa, but may be common in alfalfa harvested during July or August. These beetles are attracted to flowering vegetation and frequently feed on foliage, pollen, and nectar of alfalfa, soybean, and weed plants. The effects of this feeding are usually minor.

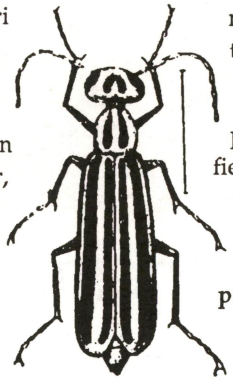
These insects are very mobile and congregate in large numbers in small areas of the field. This habit makes them easier to locate in an alfalfa field, but also increase the chance of harvesting large numbers with the hay. The cantharidin produced by the beetles is a very stable toxin. Even the dried remains of beetles in hay are toxic to livestock.

Effects on livestock

Horses are most susceptible to this toxin. Cantharidin is absorbed and excreted through the kidneys, causing irritation or serious damage to the stomach lining, small intestine, kidney, ureter, urinary tract, and urethra. The reaction depends on the number of beetles consumed.

Researches have determined the lethal dose of cantharidin is about 1 mg/kg (2.22 pounds) of cantharidin/horse body weight. In addition, an average content of 5.0 mg. of cantharidin per insect has been found for the striped blister

beetle, the most common blister beetle in Missouri alfalfa. Although many factors can influence the number of beetles necessary to cause horse mortality, calculations indicate that a minimum of 30 to 50 striped blister beetles would need to be eaten in order to kill a normal size, healthy horse. However, as few as 2 to 5 blister beetles may cause colic in horses. Even though no actual beetles have been ingested, the dried juices from crushed beetles on the hay may cause symptoms.



Striped Blister Beetle

Symptoms of blister beetle poisoning vary considerably, but may include ulcerations of the mouth, frequent play in water with lips and tongue, colic, pawing, frequent attempts to urinate, stretching, jerking contractions of the diaphragm, diarrhea, discarded intestinal tract lining in the stool and reduced levels of calcium and magnesium in the blood. **Any horse showing these symptoms should be immediately examined by a veterinarian.** The forage the animal was eating should be inspected for the presence of blister beetles.

Beef cattle and sheep are less susceptible to cantharidin poisoning, but may experience symptoms if they consume high numbers of blister beetles. Little is known about the effect of cantharidin on lactating dairy cows.

Management options

Several changes in alfalfa management can help reduce the number of blister beetles found in baled hay, but none will eliminate the problem. Management options include:

Use first cutting alfalfa as feed for horses. In most years, blister beetles will not emerge until after the first cutting of alfalfa has been harvested in Missouri.

Control weeds and adjust harvest date of your alfalfa. Blister beetles are attracted to flowering weeds and to alfalfa in the bloom stage of development. If producers can produce weed-free alfalfa and harvest before alfalfa bloom, beetles will be less likely to move into the hay field.

Avoid using hay conditioners or crimpers These implements kill beetles at the time of cutting and prevent beetles from moving out of the alfalfa as it dries. Although sicklebar mowers cause less blister beetle mortality, the tractor tire running over hay that is already mowed will result in some blister beetles being killed. To reduce blister beetle mortality while harvesting, researchers recommend using a self-propelled harvester, which has wide-set wheels and no conditioner or crimping equipment, to windrow the alfalfa as it is cut.

Apply an insecticide for control, if beetles are present before harvest. Thoroughly scout alfalfa fields 8 to 9 days prior to harvest, concentrating scouting efforts near field edges. If blister beetles are present, use carbaryl at 0.5 to 1.0 pound active ingredient/acre to control them. **(Sevin XLR Plus at 1 pint to 1 quart** or **Sevin 80S at 0.67 to 1.25 lbs. active ingredient/acre would produce the correct rate of carbaryl.)** Sevin treated alfalfa can not be harvested for 7 days following insecticide application. Beetles killed by the insecticide should fall to the ground and not be picked up be harvesting equipment. It will be necessary to scout both treated and untreated fields 1 day prior to harvesting to insure that beetles have not reinfested the field since the earlier scouting date or time of insecticide application.

Check hay for blister beetles at time of feeding. Blister beetles readily retain both their size and shape when dead. They should be easily found if present in the alfalfa hay. Removal of the beetles from the alfalfa will not make it safe for use as horse feed. When beetles are killed by harvesting equipment, cantharidin may be forced from their bodies and contaminate the surrounding hay. Because cantharidin is very stable, it will remain toxic when absorbed by the alfalfa.

Remember, these management practices can only ***reduce*** the number of blister beetles present and the subsequent risk of cantharidin poisoning, not ***eliminate*** the problem.

Precautions

Always handle insecticides with caution, irrespective of whether or not they are restricted-use compounds. Read, understand and follow the directions on the label concerning use and safety measures. Wear the protective clothing and devices suggested on the label. Avoid breathing vapors or dust, and direct contact with skin. If the insecticide concentrate contacts or contaminates the skin, immediately wash the affected area with soap and plenty of water, then change and discard clothing.

Store insecticides in their original container with legible labels securely attached. The storage area should be dry and locked at all times when not actually in use. To prevent contamination of surrounding crops, water or wildlife habitat, promptly and properly dispose of empty containers as directed on the label.

Missouri insect control recommendations are revised annually and are subject to possible change during the growing season. No discrimination is intended and no endorsement is implied.

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