



BLISTER BEETLES

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Ash-gray blister beetle, *Epicauta fabrici*.

(Courtesy of U.S. Public Health Service.)

Blister beetles are infrequent pests of several crops including alfalfa, sweet clover, potatoes, beans, and sugarbeets. They are also injurious to a wide variety of vegetables and many flowers and other ornamentals. They normally cause limited plant damage. However, when they are ingested by horses or other livestock, serious illness or even death may result.

DESCRIPTION

Blister beetles are common throughout the United States. Several species can be found in the Great Plains during the summer months.

Adults range from 1/2 to 1 inch long and have a characteristic narrow, elongate, soft body with a head wider than the pronotum (see figure). The flexible wing covers are rounded over the abdomen and the color varies from black to gray to brown. Some species have a metallic sheen or they may have conspicuous orange stripes.

The larvae of the largest genus *Epicauta* are considered beneficial, for they feed on grasshopper eggs in the soil. Many species are found in bees' nests where they feed on bee eggs and food stored in the nest.

LIFE CYCLE

Most species of blister beetles produce one generation per year. Adults emerge from the soil in early to mid summer and feed on susceptible plants. Females lay eggs in clusters containing up to 100 eggs in the soil. The eggs hatch in approximately two weeks and the active larvae seek out grasshopper egg pods on which they feed. The larvae go through several more developmental stages during the next four weeks at which time they form a thick cuticle which offers protection through the winter. The larvae overwinter in the soil, and when favorable weather conditions occur the following spring, the larvae pupate. In two additional weeks, new adults emerge and commence feeding and laying eggs for the next generation.

DAMAGE

Blister beetles occasionally cause damage to their host plants by defoliation. In most cases, the damage is localized and the amount of defoliation which occurs does not warrant economic consideration. Alfalfa, potatoes, and beans are able to compensate for substantial foliar losses with only minimal yield losses resulting from blister beetle infestations.

These insects are mobile and the gregarious nature of the blister beetle causes them to concentrate in limited areas of the field. The beetles are attracted to flowering vegetation and feed on the leaves, pollen and nectar of their hosts. In many instances, the beetles feed for a short period of time and then migrate to other plants or fields.

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Problems associated with blister beetles have traditionally been in those areas where environmental conditions favor frequent outbreaks of grasshoppers. This is especially true in the relatively arid states of the west, central and northern Great Plains.

EFFECTS ON LIVESTOCK

All species of blister beetles produce a toxic substance called cantharidin. This toxin is a well-known vesicant (blister-causing substance) that is quickly absorbed upon contact and causes inflammation and blistering of internal and external body tissues. The amount of toxin produced varies considerably between species. The ash-gray, black, striped, and margined blister beetles are a few of the more common species which produce levels of cantharidin capable of poisoning livestock. Livestock come in contact with blister beetles when they consume infested alfalfa hay. Horses are most susceptible to the toxin, while sheep and cattle are more tolerant. The reaction to the toxin depends upon the relative dose; enough ingested beetles can be lethal to any animal.

Researchers have determined the lethal dose of cantharidin to be approximately 1 milligram per kilogram of horse body weight. This means that about 200 blister beetles could have levels of toxin sufficient to kill an adult horse. In addition, an average of 5.0 mg of cantharidin has been found in striped blister beetles, which indicates that 30 to 50 adults could be potentially lethal. However, even a few beetles may cause colic in horses. Cantharidin can also be lethal to cattle and sheep. Although less susceptible than horses, they may experience symptoms if enough beetles are consumed. A laboratory study has shown that cantharidin can reduce the digestibility of certain forages. Little information or research exists addressing the effects of cantharidin on lactating dairy cows. Symptoms of sublethal poisoning include depression, diarrhea, elevated temperatures, increased pulse and breathing rates, and dehydration. There is also frequent urination, especially after the first 24 hours. If cantharid poisoning is suspected, a veterinarian should be contacted immediately.

The toxin is extremely stable. Crushing or chemically killing the beetles will not diminish the toxin's activity. Even the remains or dried juices from crushed beetles on the hay may cause severe digestive and urinary tract ailments in domestic animals.

MANAGEMENT STRATEGIES

Several management options are available which can reduce the number of blister beetles found in forage crops but none will eliminate the problem.

Adjust harvest dates and maintain weed free alfalfa. Since blister beetles are readily attracted to flowering plants, controlling the number of flowering weeds in the field and cutting alfalfa prior to bloom stage will reduce the potential for infestation.

Check hay for blister beetles prior to cutting. Blister beetles are gregarious and are often found in high numbers in localized areas of the field. Prior to harvest, growers should be aware of potential infestations, and if blister beetles are present in the field, the harvest should be delayed for several days. In many instances, the beetles will move. However, they may move to another part of the field, so a careful inspection is necessary.

If beetles are present in the field at the time of harvest, avoid using hay conditioners or crimpers. These implements may kill the beetles and prevent them from moving out of the hay as it dries. A self-propelled harvester which has wide-set wheels and no conditioner or crimping equipment can be used to windrow the hay, resulting in fewer dead blister beetles in the hay.

Apply an insecticide for beetle control prior to harvest. Fields suspected of being infested should be thoroughly scouted (concentrating near the field edges) prior to harvest, and if blister beetles are present, an insecticide may be applied for control. Beetles killed by the insecticide will most likely fall to the ground and should not be picked up by the harvesting equipment. Fields should be rechecked 24 hours prior to cutting to ensure that new swarms of blister beetles have not reinfested the fields. Several insecticides registered for use on alfalfa, dry beans, soybeans, potatoes and sugarbeets show good activity on blister beetles. Observe label directions for rates, pre-harvest intervals, restrictions and precautions. Fields should not be treated at peak bloom to avoid bee kill.

In all cases, hay suspected of being infested with blister beetles should be checked for beetles prior to feeding. Contaminated hay should not be fed to horses or other livestock; removal of the beetles from the hay will not make it safe.

It is to the grower's advantage to minimize harvest operations which kill blister beetles, thereby minimizing the possibility of feed contamination. Management practices can only reduce the number of blister beetles present and the potential risk of cantharidin poisoning.

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