Blister Beetles: Reducing the Risk of Blister Beetle Contamination in Alfalfa Hay.

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Blister beetles contain a chemical, cantharidin, that when consumed by horses and other livestock, can cause illness and sometimes death. Blister beetles in alfalfa fields at harvest can be killed by the harvest machinery and incorporated into the baled hay. Cantharidin is a very stable compound and remains toxic even in the dead and dried blister beetles that may contaminate alfalfa hay. Since blister beetles often occur in large groups, or swarms, within a field, dead beetles can be concentrated in a small portion of the bales. Cantharidin causes irritation of the lining of the digestive and urinary system in horses. The number of beetles that result in illness is variable and depends on the sex and species of blister beetle and on the age, weight, breed and general health of the horse. The estimated number of ingested beetles that would be lethal to a horse ranges from 50-545.

Identification.

Blister beetles are elongated, soft-bodied beetles that vary in length from ½ to 1¼ inches. There are many species of blister beetles and their colors vary from black, brown or gray to striped or spotted forms with a combination of colors. Photos of many of the blister beetle species found in Texas are posted at [http://texasento.net/TXMeloidae.html](http://texasento.net/TXMeloidae.html). Blister beetles have long antennae and legs. When viewed from above, blister beetles have a constriction between the back of the head and the thorax, creating a neck-like appearance. Adults feed on pollen and leaves and are attracted to blooms of alfalfa and many other crop and weedy broadleaf plants. Correct identification is essential because blister beetles can be confused with other beetles. For help with identification, collect a sample of the insects and take them to your county Extension agent.

Two species of striped blister beetles, *Epicauta vittata* and *E. occidentalis*, (see photo) contributed most to the risk of livestock poisoning in a study conducted by Kansas State University. They attributed the poisoning risk to the fact that these two species tend to congregate in dense swarms. In Oklahoma, all fatalities caused by blister beetle toxicity in horses examined by Oklahoma State University veterinarians were caused by the striped blister beetle. However, finding any species of blister beetles in alfalfa should be a concern.

Field Scouting for Blister Beetles.

Although blister beetles may be present in any cutting of alfalfa hay, the first two cuttings of hay in the spring/early summer are less likely to be infested. Begin weekly scouting for blister beetles about 2 weeks prior to cutting. Since there is a 7 day waiting period after application of an insecticide for blister beetles and before harvest, this provides time to apply an insecticide if needed. Continue monitoring the field for beetles until the field is cut. Look for blister beetles along the field margins and along weedy areas around the field. Beetles are typically found in
the upper part of the plant canopy feeding on pollen within blooms or on tender leaves. Also, look for blister beetles on flowering weeds within the field. If blister beetles are found, apply an approved insecticide. However, beetles may fly into a field after an insecticide application and survive. For this reason, fields should be surveyed after insecticide treatment just before cutting to ensure that beetles are not detected. Even if no insecticide was applied, look for blister beetles again 1-2 days before cutting. Blister beetles are very mobile and swarms can move from one area of the field to another in a few days. During cutting, the operator should watch for blister beetle and avoid cutting in areas where beetles are present. Observations indicate that beetles killed by insecticides do not remain in the cut hay; instead they fall to the ground where they cannot be picked up by the bailer. Most beetles in baled hay were probably killed as they went through the crimper and harvester. Raking hay before baling may allow more dead beetles to fall to the ground, reducing the number of beetles in the harvested hay. Live beetles will usually leave the field soon after it is cut.

Cultural Control Practices to Reduce the Risk of Blister Beetle Contamination.

1. Cut alfalfa prior to 10% bloom. Blister beetles are attracted to flowering plants.
2. Control weeds in and around alfalfa fields. This reduces the likelihood of blister beetles establishing themselves along field margins and then migrating into alfalfa fields.
3. Cut hay without using crimper (conditioning rollers) when blister beetles are suspected or present as they crush beetles, increasing the likelihood that they will be present in bailed hay.
4. Raking the hay before bailing can help dislodge dead beetles from the hay.
5. Avoid driving over standing or freshly cut alfalfa as wheel traffic can also crush beetle and increase risk of contaminating the harvested alfalfa.

Insecticides.

Insecticides labeled for control of blister beetles in alfalfa are listed below. Regardless of what insecticide is applied, or if no insecticide is applied, sample the field for blister beetles 1-2 days before cutting. It is the users’ responsibility to read all pesticide labels carefully and to follow all instructions on application, safety, and other restrictions.

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbaryl</td>
<td>Carbaryl 4L, Sevin XLR PLUS</td>
<td>Wait 7 days after application before cutting. Hazard to bees. See below.</td>
</tr>
<tr>
<td>gamma–cyhalothrin</td>
<td>Proaxis</td>
<td>Do not apply within 1 day of harvest for forage or within 7 days of harvest for hay. Hazard to bees, see below.</td>
</tr>
<tr>
<td>lambda-cyhalothrin</td>
<td>Silencer, Warrior with Zeon</td>
<td>Do not apply within 1 day of harvest for forage or within 7 days of harvest for hay. Hazard to bees, see below.</td>
</tr>
<tr>
<td>chlorpyrifos and lambda-cyhalothrin</td>
<td>Cobalt</td>
<td>Do not cut or graze treated alfalfa within 7 days after application of 6-13 oz/acre, within 14 days after application of 13-26 oz/acre, or within 21 days after application of rates above 26 oz/acre. Hazard to bees, see below.</td>
</tr>
</tbody>
</table>

Carbaryl may kill honeybees and other bees in substantial numbers. This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds in bloom. Notifying beekeepers within 1 mile of treatment area at least 48 hours before carbaryl is applied.
will allow them to take additional steps to protect their bees. Limiting applications times to within 2 hours of sunrise or sunset will minimize risk to bees.

Proaxis is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Silencer and Warrior. Avoid application when bees are actively foraging by applying during the early morning or during the evening hours. Be aware of bee hazard resulting from a cool evening and or morning dew. It may be advisable to remove bee shelters during and for 2-3 days following application.

Cobalt is highly toxic to bees exposed to direct treatment on alfalfa. Do not apply if nearby bees are clustered outside of hives and bees are foraging in the treated area. Before applying carbaryl, warn beekeepers to relocate hives beyond the bee flight range until one week after application, or take other equally effective precautions.

**What Horse Owners Can Do to Reduce the Risk of Blister Beetle Poisoning.**

1. Know your alfalfa supplier. Ask what precautions the grower takes to reduce the risk of blister beetle contamination.
2. Alfalfa harvested before May or after September is less likely to be contaminated with blister beetles as beetles are most abundant from May through August.
3. Inspect alfalfa hay for blister beetles as it is removed from the bale. While inspection is important, blister beetles can be crushed beyond recognition and failing to find beetles is no guarantee of their absence.

**References and additional resources.**


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