



# Diagnostic Facts



Diagnostic Services  
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## Toxicity, Identification, and Control of Hoary Alyssum in Forages

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**H**oary alyssum (*Berteroa incana*) is a weed species that is widely distributed throughout the Northeastern and North Central U.S. and Canada. This plant is commonly found growing in closely grazed pastures, drought-stressed meadows, abandoned fields, and along roadsides. Hoary alyssum is well-adapted to dry conditions, particularly in areas with sandy to gravelly soils.

Given the soil characteristics in Michigan, hoary alyssum could become an invasive weed species in pastures and hay fields throughout much of the state. Field reports from veterinarians and feeding studies conducted by university researchers have shown that hoary alyssum can be poisonous to horses. Some horses appear to be more adversely affected than others. With this uncertainty, horse owners and hay producers in Michigan should be aware of the potential toxicity of this weed species and be able to identify and control hoary alyssum in their pastures and hay fields.

### Clinical Signs / Toxicity

Researchers at the University of Minnesota have reported that ingestion of hay containing a high level of hoary alyssum can cause horses to experience depression and “stocking up”, or swelling of the lower legs. Fever and short-term diarrhea may also accompany consumption of this plant. These symptoms can usually be observed 12 to 24 hours following ingestion of hoary alyssum. Symptoms normally subside 2 to 4 days after the source is removed.



Photo 1. Mature hoary alyssum plant.

In extreme cases, severe swelling of the lower legs, apparent founder, stiffness in joints, and death have been observed

in horses ingesting hay with high percentages (30-70%) of hoary alyssum. However, results of ingestion of hoary alyssum are somewhat variable. In one study only about half of the horses showed any clinical signs of toxicity when ingesting hay with 30 to 70% hoary alyssum.

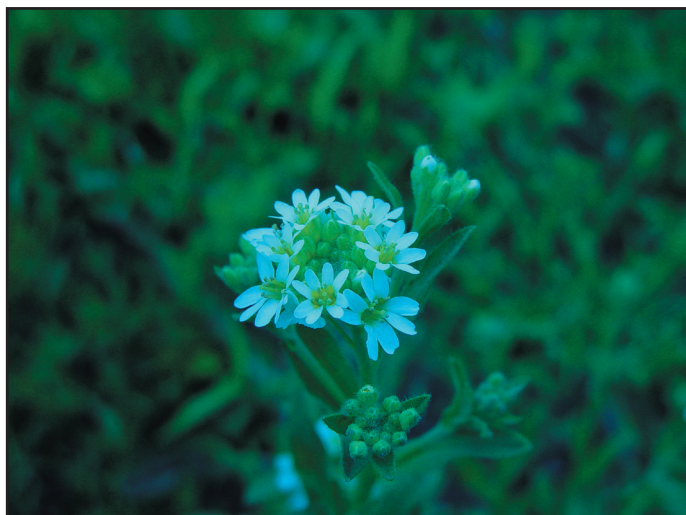
The clinical signs are milder when ingesting lower percentages of this plant. It is recommended that hay containing greater than 30% hoary alyssum not be fed to horses.



*Photo 2.* Hoary alyssum rosette.

## Biology / Identification

Hoary alyssum is a member of the mustard family (Brassicaceae) and can exist as an annual, biennial, or short-lived perennial that reproduces by seed (Photo 1). Plants first form a basal rosette of leaves (Photo 2) followed by an upright, central stem. Stems are 1 to 3 feet tall, very stiff and erect, with many branches near the top of the plant. Leaves produced on the stem are simple, alternate in arrangement, narrow and oblong in shape, with smooth margins. The stems, leaves, and seed pods are covered with rough, grayish-green star-shaped hairs.



*Photo 3.* Hoary alyssum flower.

These hairs give the plant a pale-green coloration. The name “hoary” denotes the rough hairs on the stems, leaves, and fruit. Hoary alyssum has numerous white flowers with four deeply divided or notched petals (Photo 3). Seed pods are round to oblong in shape (5 to 9 mm long, 3 to 4 mm wide), slightly flattened, hairy, and swollen with a short beak or point on the end (Photo 4). The seed pods are usually held close to the stems.



*Photo 4.* Seed pods of hoary alyssum.

## Control

Aside from the apparent toxic properties, hoary alyssum can reduce the overall quality, palatability, and yield of forages. High levels of mature hoary alyssum in hay can decrease crude protein and digestibility of the forage and may also reduce the animal’s preference for the forage. Hoary alyssum can compete very well with forage growth when the crop is stressed, which can result in significant reductions in yield.

Proper hay and pasture management is essential to prevent or minimize the invasion of this weed species. Hoary alyssum tends to become a problem in pastures and hay fields following a period of stress, which could be caused by factors such as drought, winterkill, overgrazing, or poor soil fertility. Following good

Table 1. Hoary alyssum response to herbicides in forage legumes and grasses.

Type of Forage	Type of Application	Crop Tolerance <sup>1</sup>	Herbicide Formulation/A	Herbicide Effectiveness <sup>2</sup>
<b>Seedling Legumes</b>				
Balan	PPI	2	3 qt 1.5EC	Poor
Buctril/Moxy <sup>3</sup>	POST	3	1 pt 2S	Fair
Eptam	PPI	2	3.5 pt 7E	Fair
Kerb	POST	1	1.5 lb 50W	Poor
MCPA <sup>4</sup>	POST	4	0.5 pt 4L	Good
Pursuit <sup>3</sup>	POST	2	4 oz 2S 1.4 oz 70DG	Fair/Good
2,4-DB	POST	2	2 qt 2L	Fair
<b>Established Legumes</b>				
Sencor <sup>5</sup>	Dormant	3	1 pt 4L 0.67 lb 75DF	Good
Sinbar <sup>5</sup>	Dormant	3	1.25 lb 80W	Good
Velpar <sup>5</sup>	Dormant	3	1 qt 2L 0.66 lb 75DF 0.55 lb 90SP	Excellent
<b>Forage Grasses</b>				
Banvel	POST	2	1 qt 4L	Good
Stinger <sup>6</sup>	POST	2	0.5 pt 3L	Poor
2,4-D ester	POST	2	1 qt 4L	Good

<sup>1</sup> Crop Tolerance: 1=Minimal risk of crop injury; 2=Crop injury can occur under certain conditions (soil-applied – cold, wet; foliar applied – hot, humid); 3=Severe crop injury can occur. Follow precautions under *Remarks and Limitations* in MSU Extension Bulletin E-434 “Weed Control Guide for Field Crops” and on the label; 4=Risk of severe crop injury is high. Recommended only in rescue situations.

<sup>2</sup> The above ratings are a relative comparison of herbicide effectiveness. Weather conditions greatly influence the herbicide’s effectiveness, and weed control may be better under favorable conditions or poorer under unfavorable conditions.

<sup>3</sup> Apply to alfalfa only.

<sup>4</sup> Use only when the forage is established with a small grain companion crop.

<sup>5</sup> Apply to dormant alfalfa in late fall or early spring.

<sup>6</sup> Apply only to established forage grasses.

crop management practices during establishment and proper maintenance of the forage will provide the basis of an effective weed control program.

Factors such as proper planting date, seeding rate, and variety selection, as well as providing insect control, adequate soil fertility, controlled grazing, and following proper cutting schedules are important management practices that will provide optimum conditions for a vigorous forage crop.

When establishing new forages, it is imperative that weeds be controlled before initial seeding. Weeds are often controlled by seedbed preparation in conventional tillage systems and with burndown herbicides when no-tillage practices are employed. During the seedling year, MCPA and 2,4-DB will provide fair to good control of hoary alyssum (Table 1). MCPA may be used when the forage is seeded with a companion crop.

In established forage legumes, an application of Sencor, Sinbar, or Velpar in late fall or early spring to dormant alfalfa will provide the most effective control of hoary alyssum (Table 1). Velpar may be applied to forage stubble between cuttings, but no other effective herbicide options exist beyond this point. Be sure to look at the rotation restrictions of Velpar before planting crops in areas treated with this herbicide.

In forage grasses, Banvel and 2,4-D ester applied in fall or spring should provide good control or suppression of actively growing hoary alyssum. **Warning for Southwest Michigan in areas where grapes are grown** (parts of Berrien, Cass, Kalamazoo, and Van Buren Counties): a 2,4-D and MCPA exclusion zone is enforced by the Michigan Department of Agriculture. In this zone, it is illegal to apply ester formulations of 2,4-D and MCPA from May 1 to October 1. Amine formulations of 2,4-D and MCPA

can be applied in this zone with spray pressures not to exceed 40 psi. There are no restrictions on dicamba. However, extreme caution should be used when applying dicamba-containing products in close proximity to grapes as significant injury can occur.

Stinger should also provide some level of hoary alyssum control, but this herbicide may only be applied to established forage grasses. Many pasture and hay fields grown for horse consumption are commonly grass-legume mixtures. Unfortunately, there are no herbicides labeled for control of broadleaf weeds in forage mixtures without the possibility of detrimentally affecting the forage legume as well. Consult MSU Extension Bulletin E-434 “Weed Control Guide for Field Crops” and the product label for harvest and rotation restrictions as well as other pertinent information.

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Photos 1, 2, and 3 – Steven Gower, MSU Diagnostic Services; Photo 4 – Rob Richardson, Department of Horticulture, Michigan State University.

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NOTICE: The user of this information assumes all risks for personal injury or property damage. Always read the label before making pesticide applications. The pesticide label is the legal document that regulates the use of a pesticide. Pesticide labels can change suddenly. These recommendations are not intended to replace the specific product labels.

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