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# Toxic plants of concern in **PASTURES AND HAY** for Michigan horses

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**M**any Michigan horse owners worry that toxic plants may be present in their pastures and hay. Although numerous plants can create problems to horse health, the reality is that poisonings from toxic plants are not all that common under most circumstances. This bulletin covers 12 toxic plants that are commonly found in Michigan pastures and hayfields. Though not an inclusive list, it contains the toxic plants that are most likely to affect horses. (Other bulletins in this series address toxicities from trees and ornamentals, and other feed quality issues.)

In general, horses instinctively stay away from most toxic plants in pasture situations. Most toxic plant consumption is a result of circumstance rather than a desire to eat the offending plant. Several management techniques can help to minimize toxic plant consumption:

- Become familiar with common toxic plants in the area, what they look like and in what season they are likely to be present.
- Spend time in the pastures to know what plants are there that could potentially cause problems.
- Always provide ample good quality forage.
  - Don't allow pasture to become overgrazed.
  - Pay particular attention during dry weather — many toxic plants can survive dry conditions better than common pasture grasses.
  - Monitor fencerows in sacrifice areas and turnout lots — this is a common place to find toxic plants.
- Provide hay in sacrifice areas and turnout lots.
- Hay can be a challenge because horses can't always sort the toxic plants as they do in pasture situations. Be sure to monitor hay for quality.
- When grazing a new area or newly seeded pasture, introduce the horses slowly and monitor for any physical change or change in behavior.
- When away from the farm for trail rides or shows, watch horses closely to ensure that they don't eat something they shouldn't.
- Some toxicities take repeated consumption over time, so monitor horses closely on a daily basis and note any change in physical appearance or behavior.

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## Hoary alyssum

**Scientific name:** *Berteroa incana* (L.) DC.

### Habitat

Often found in poorer producing areas, especially sandy or gravelly soils. It is also found in fields that have been recently disturbed. It can be found in pastures or hayfields.

### Description

Hoary alyssum is a herbaceous plant with a grayish green stem and typically 1 to 4 feet tall. Leaves are oblong and covered with hairs. The seedpods are oblong and pointed on the end. Plants produce multiple white flowers ¼ inch wide with four deeply divided petals on each. The plant will bloom and produce seeds throughout the entire growing season, even in the early spring before good established pasture is available.

### Exposure

Hoary alyssum is toxic in both fresh (pasture) and dry (hay) form. Toxicity is most common with hay because horses are less likely to consume the weed in a productive pasture. The toxic principle has not been identified.

### Clinical signs

Symptoms usually occur between 12 and 48 hours after ingestion. The most common symptoms are swelling of the lower legs ("stocking up"), fever, colic and laminitis. Death is rare but has been observed in horses consuming hay containing greater than 30 percent hoary alyssum. Long-term lameness issues related to founder may result.

### Treatment

Remove the source of hoary alyssum from the diet. Treat symptoms with appropriate supportive care. Recovery may take days to months, depending on the severity of the symptoms.



Hoary alyssum

Source: Merel R. Black - <http://wisplants.uwsp.edu>



Red clover

Source: Merel R. Black - <http://wisplants.uwsp.edu>



White clover

Source: Merel R. Black - <http://wisplants.uwsp.edu>



Alsike clover

Source: Merel R. Black - <http://wisplants.uwsp.edu>

## Clovers (red, white and alsike)

**Scientific names:** *Trifolium pretense* L. (red clover), *Trifolium repense* L. (white clover) and *Trifolium hybridum* L. (alsike clover)

### Habitat

All of these clovers can be found in virtually any pasture, hayfield or roadside ditch. They are commonly used in pasture and hay seed mixes.

### Description

**Red clover** leaves are usually hairy and may contain an inverted V watermark. The flowers are usually dark purple and are borne at the terminal ends of the stems, which also bear leaflet clusters.

**White clover** has a white flower that terminates a single stalk coming from the aboveground stem (stolon). The leaflets are also found on separate stalks arising from the stolon.

**Alsike clover** flowers are usually pink and white but can be darker, depending on growing conditions. The flower stem originates from the same point off the main stalk as the leaflet stems.

### Exposure

The clovers themselves are not considered toxic. The symptoms are presumed to be a result of various molds that grow on clovers during hot, humid times during the growing season. These molds typically last for about 2- to 4-week periods. Clovers are not typically a problem in dry hay, although a high percentage of clover in hay can prolong drying time and increase the chances of moldy hay.

### Clinical signs

**Alsike clover** – Two distinct syndromes are associated with alsike clover. The first is photosensitivity, which is extreme sunburn on non-pigmented skin (usually found on the muzzle and

lower legs). The cause of this is believed to be the ingestion of *Cymodothea trifolii* mold, which can grow on the undersides of alsike clover leaves during hot, humid weather. The secondary syndrome is caused by long-term exposure to the mold and is commonly known as "big liver disease." This syndrome can occur in horses with dark pigmented skin, also. The symptoms of big liver disease include a yellowing of the membranes around the mouth and eyes, weight loss and dark-colored urine.

**Red and white clovers** – The syndrome associated with these clovers is commonly known as "slobbers." It is caused by *Rhizoctonia leguminicola* mold or black patch fungus, which can grow on red and sometimes white clovers during hot, humid conditions. Slaframine is the toxic principle. The primary clinical symptom is profuse slobbering, which will occur within 30 to 60 minutes after consumption.

### Treatment

**Alsike clover** – Remove alsike clover from the horse and remove the horse from sunlight. Treat sunburn with moisturizers and antibiotics to prevent secondary infections, as recommended by a veterinarian. Any long-term complications are likely to be related to loss of liver function and should be monitored closely by a veterinarian.

**Red and white clover** – Remove clover from the diet. The slobbering should stop within 1 to 4 days.

### Recommendations

Even with these potential problems, clovers can still be useful for horse hay and pastures. Alsike clover should be avoided in seed mixes. White clover tends to create fewer problems and can be used in seed mixes. Clovers should not make up a significant percentage of any pasture mix.

## Saint-John's-wort

**Scientific name:** *Hypericum perforatum* L.

### Habitat

Often found in poorer producing areas, especially sandy or gravelly soils, and in overgrazed areas, along roadsides and in open woods.



Common Saint-John's-wort

Source: Merel R. Black - <http://wisplants.uwsp.edu>

### Description

This perennial herb grows 1 to 1 1/2 feet tall. It has 1/2- to 1-inch-long, flat-topped clusters of golden yellow flowers that are 3/4 to 1 inch broad. Bloom occurs from midsummer to late fall. The five petals often have distinct black dots around their edges, and the leaves may have similar dots. The black dots are glands that contain hypericin, the toxic principle.

### Exposure

Young, tender (vegetative) plants are the most likely to be grazed; mature plants have low palatability. Horses will consume the mature plants only when feed is extremely limited. Hypericin remains active when dried, so hay with large quantities of vegetative Saint-John's-wort should be avoided.

### Clinical signs

Hypericin causes chemically induced sunburn. Much like alsike clover, hypericin causes photosensitization of non-pigmented areas of the skin. The mucous membranes around the eyes and muzzle may also be affected.

### Treatment

Remove Saint-John's-wort from the animal's diet. Remove the animal from direct sunlight for a few weeks. Treat sunburn with moisturizers and antibiotics, as recommended by a veterinarian.

## Black nightshade

**Scientific name:** *Solanum ptychanthum* Dunal

### Habitat

Black nightshade commonly grows in open woods, old fields, waste areas, pastures, along roadsides and around farm buildings.

### Description

Black nightshade is a low-branching annual 1 to 2 feet tall with triangular stems that bear oval, thin-textured, alternate leaves with wavy margins. The tiny-white



Nightshade

Source: Merel R. Black - <http://wisplants.uwsp.edu>

flowers, borne in drooping clusters on lateral stalks between the leaves, resemble tomato flowers. The berry (fruit) is green when immature and purplish black when ripe.

### Exposure

All parts of the plant are potentially toxic, but it is not palatable and is rarely consumed by horses on pasture. The risk of toxicity increases when it is contained in hay. The major toxin is solanine, an alkaloidal glycoside.

### Clinical signs

Clinical signs of poisoning by plants in the nightshade family tend to reflect gastrointestinal irritation and/or effects on the central nervous system. Gastrointestinal signs can include poor appetite, abdominal pain and diarrhea, which may become bloody. Central nervous system signs can include depression, difficulty breathing, lack of coordination, weakness, collapse, convulsions and possible death. In some cases, chronic toxicity can develop when animals consume a small amount of nightshade each day for a long period of time. These animals tend to be unthrifty and depressed, and have diarrhea or constipation.

### Treatment

Treatment is largely symptomatic until the clinical signs wear off, usually a day or two. Death is rare in animals.

## Common milkweed

**Scientific name:** *Asclepias syriaca* L.

### Habitat

Milkweed grows in woods and swamps but most commonly in dry soils of fields and roadsides.

### Description

Milkweed get its name from the thick, sticky, milky sap that oozes out of cut or torn leaves, stems and fresh pods.



Common milkweed

Source: Merel R. Black - <http://wisplants.uwsp.edu>

The usually solitary stems of milkweed grow 1 to 5 feet tall and bear opposite (sometimes whorled), sometimes fleshy leaves with smooth margins. Flowers emerge in umbrella-like clusters and range in color from pink to rose-purple to orange or white. The fruit is a pod with cottony seeds.

### Exposure

Milkweed plants are considered unpalatable and are eaten only when other forages are not available. They may also be found in hay. The primary toxic principles are cardiac glycosides that cause gastrointestinal, cardiac and respiratory problems and can cause death if enough is consumed. Resins (especially galitoxin) in the milky sap may also contribute to the toxicity of milkweed. The toxic effects are found in both fresh and dried forms; hay containing milkweed should be avoided.

### Clinical signs

Symptoms of milkweed ingestion include colic, diarrhea, abnormal heart rate and rhythm; rarely, death. Horses are very reluctant to eat this plant, and its toxicity is only rarely reported.

### Treatment

There is no antidote if an animal consumes milkweed.

## Bracken fern and field horsetail

**Scientific names:** *Pteridium aquilinum* and *Equisetum arvense* L.

### Habitat

**Bracken fern** is commonly found in wooded areas and in open areas with particularly acid soils.

**Field horsetail** is commonly found in moist to wet and cool areas such as ditches and low areas of pastures or hayfields.

### Description

**Bracken fern** is a perennial herb that spreads by rhizome-type roots. It can grow to over 4 feet tall. Spores are borne on the underside of each fern-like leaf.

**Field horsetail** is a small herbaceous perennial that grows from deeply buried rhizomes. Stems are jointed, hollow and



Bracken fern

Source: Chris Evans, River to River CWMA, Bugwood.org



Field horsetail

Source: John Cardina, The Ohio State University, Bugwood.org

rough-textured. A cone-like structure borne at the top of the stem houses millions of spores.

### Exposure

Both plants are most likely to be consumed in dry hay; fresh plants would not likely be eaten unless access to forage is extremely limited. Considerable amounts of these plants would have to be consumed over several days or weeks for horses to develop symptoms. Thiaminase, an enzyme that breaks down thiamine, is the cause of toxic symptoms.

### Clinical signs

Weight loss, central nervous system disorders and muscle weakness are the most common symptoms. Incoordination after 30 to 45 days of ingestion can lead to convulsions and death.

### Treatment

Provide adequate quality forage and limit exposure. Therapeutic doses of thiamine should be administered under the supervision of a veterinarian.

## White snakeroot

Scientific name: *Eupatorium rugosum*

### Habitat

White snakeroot is found in woods, damp and shady pastures, and occasionally in thickets and clearings, especially at the edges of wooded areas. It grows only in shaded areas.

### Description

White snakeroot grows from fibrous, matted roots as a smooth, erect, perennial herb 1 to 3 feet high. It has opposite, oval, pointed-tipped leaves with sharply toothed edges. The upper surfaces of the leaves are dull; the lower surfaces are shiny with three prominent main veins. Small, white flowers in compound terminal clusters are conspicuous in late summer.

### Exposure

This plant is highly toxic all year on pasture and remains toxic when dried in hay. Single or multiple ingestions of 1 to 10 percent of a horse's body weight can be lethal. Snakeroot contains tremetol, a viscous oil extract that contains numerous toxic chemicals.



White snakeroot

Source: Merel R. Black - <http://wisplants.uwsp.edu>

### Clinical signs

Symptoms generally occur within 1 to 2 days after ingestion and include muscle tremors, elevated heart rate, muscle weakness, congestive heart failure, cardiac arrhythmias and difficulty swallowing.

### Treatment

Prevention by fencing off wooded areas and providing supplemental forage during dry periods is the best approach. If an animal does ingest white snakeroot, the required treatment is activated charcoal and a cathartic administered as soon as possible by a veterinarian.

## Water hemlock

Scientific name: *Cicuta maculata* L.



Water hemlock

Source: Kenneth J. Sytsma - <http://wisplants.uwsp.edu>

### Habitat

Water hemlock is found in swampy areas and marshes, wet meadows and pastures, and along streambanks and low roadsides.

### Description

The perennial stem of water hemlock may grow to 7 feet from its cluster of two to eight fleshy or tuberous roots. Stems are smooth, branching, swollen at the base, purple-striped or mottled, and hollow except for partitions at the

junction of the root and stem. A yellow, oily liquid smelling like parsnips exudes from cut stems and roots. Leaf petioles partially sheath the stems. The small, white flowers are borne in flat-topped, umbrella-like clusters at the tips of stems and branches. Seed pods are small and dry with rounded, prominent ribs.

### Exposure

Water hemlock is considered one of the most toxic native plants in North America. Young leaves and roots are the most toxic parts of the plants. Less than 1 pound of roots may be lethal to an adult horse. Cicutoxin, which acts as a direct stimulant to the nervous system, is the toxic principle.

### Clinical signs

Symptoms occur as early as 15 minutes after ingestion and include excessive salivation, muscle twitching, teeth grinding and convulsive seizures. Death, due to respiratory paralysis, can occur as early as 45 minutes after ingestion.

### Treatment

The owner should not attempt treatment — seizure activity can be violent and dangerous. Recovery is possible if the animal survives the first few hours because the toxin acts rapidly and is quickly detoxified by the body.

## Jimson weed

**Scientific name:** *Datura stramonium* L.

### Habitat

Jimson weed (also called jimson weed) commonly grows in cultivated fields, waste areas, barnyards, abandoned pastures, roadsides and feedlots.



Jimson weed

Source: Howard F. Schwartz, Colorado State University, Bugwood.org

### Description

This stout, coarse annual grows to 5 feet tall with strongly scented, coarsely toothed, green or purplish alternate leaves. The large, trumpet-shaped flowers are white or purplish and are formed singly at forks in the stems. The fruits are hard, spiny capsules that split open along four lines at maturity to release numerous tiny, black seeds.

### Exposure

Animals will avoid eating Jimson weed whenever possible. Even when forages are scarce, animals are reluctant to consume this plant. For animals, the danger lies primarily in the consumption of seeds that contaminate prepared feeds such as hay, grains or processed feeds. Jimson weed contains many toxic components — in particular, alkaloids. As much as 0.7 percent of the fresh weight of the leaves may be toxic alkaloids. The seeds are believed to have alkaloid concentrations greater than those in the leaves and stems, and even the nectar is toxic.

### Clinical signs

Symptoms can occur within several minutes to several hours and include seeking water to drink, dilated pupils, agitation, increased heart rate, trembling and convulsions (which may be violent). Horses may act as if they don't know where they are or appear to be seeing things or people that aren't there. Animals may also become comatose and possibly die.

### Treatment

The owner should not attempt treatment — convulsions can be violent and dangerous. Contact a veterinarian quickly — medications are available to counteract the toxic effects of the alkaloids.

### References

Natural Poisons in Horses (2nd edition). 1995. Jeffery O. Hall, William B. Buck, Louise-M Cote, National Animal Poison Control Center: Urbana, Ill.: University of Illinois.

Plants Poisonous or Harmful to Horses in the North Central United States. 2007. Krishona Martinson, Lynn Hovda, Mike Murphy, et al. University of Minnesota Extension (publication number 08941) and the Minnesota Racing Commission.

Indiana Plants Poisonous to Livestock and Pets. Rebecca J. Goetz, Thomas N. Jordan, John W. McCain, Nancy Y. Su. Cooperative Extension Service, Purdue University. <http://www.vet.purdue.edu/depts/addl/toxic/cover1.htm>