



A4019

Toxic Plants in Midwest Pastures and Forages

Anders Gurda, Peg Reedy, Mark Renz

A4019

Toxic Plants in Midwest Pastures and Forages

University of Wisconsin-Extension, Cooperative Extension



Table of Contents

Introduction	4
When and where poisoning occurs	5
If you suspect plant poisoning	7
Prevention is the best course of action	9

List of Toxic Plants

Alsike clover	10
Black locust	11
Box elder	12
Bracken fern	13
Buttercups	14
Cocklebur	15
Hoary alyssum	16
Horsenettle	17
Horsetail	18
Jimsonweed	19
Lambsquarters	20
Milkweeds	21
Nightshades	22





Oaks	23
Pigweeds	24
Poison hemlock	25
<i>Prunus</i> species	26
Red maple	27
Sorghum, sudangrass	28
Spotted water hemlock	29
St. Johnswort	30
Sweetclover	31
Tall fescue	32
White snakeroot	33
Wild parsnip	34
Yew	35

Table 1. Grazing and harvesting restrictions for herbicides used in pastures	36
--	----

Resources

Publications	37
Websites	37

Introduction

While most plants are safe for livestock to consume, a few species can sicken or even kill animals if ingested. Recognizing poisonous plants and proper livestock management are important steps in minimizing the potential for poisoning. If plant poisoning is suspected, **contact a veterinarian or other specialist immediately**—a rapid response may prevent serious injury or death.

Signs of poisoning differ in clinical symptoms and severity depending on the amount of the poisonous plant consumed, livestock species and size, general animal health, and concentration of the toxin in the plant. As these factors can vary considerably, differences in toxicity are often observed in animals over time. Symptoms may range from the inability to perform to fullest potential to more serious manifestations, including slobbering, tremors, a lack of coordination, erratic behavior, convulsions, or even sudden death.

Depending on the plant part (e.g. leaves, stems, roots, fruit, or seeds), the amount of toxic compound present can vary considerably. Variations in toxicity over the growing season also make it difficult to determine the degree of poisoning. And some toxicities result from repeated consumption over time.





When and where poisoning occurs

Fortunately, plant poisoning is infrequent in the Midwest, and toxicity is often a result of specific situations/timeframes. Understanding the conditions that lead to plant toxicity can help reduce the risk of harm or death in susceptible animals. If any of these situations we describe below have the potential to happen to your livestock, consider management practices to eliminate poisonous plants of concern.

First grazing in the spring before desirable forage growth. In early spring, plant tissues are young and more palatable. Livestock may feed on poisonous plants at this time, especially if other desirable forages haven't started to grow. To reduce the risk of animals feeding on poisonous plants, control these plants or limit animal access into areas where they are known to be present until ample desirable forage is present.

Limited desirable forage available. Hungry animals are less selective and more likely to eat plants they would otherwise avoid, especially during drought conditions, in the fall, or when pastures are overgrazed. Make sure adequate forage is always available, especially when poisonous plants are present.

After herbicide application. Many weeds that are not normally palatable to animals may become highly palatable after herbicide application. In general,

a 14-day waiting period is recommended following application of herbicides before allowing animals to graze the area. Read the herbicide label for more specific recommendations and always follow all label directions (see table 1, pg. 36).

After an application of nitrogen fertilizer. Fields with an abundance of nitrate-accumulating plants—including pigweeds, lambsquarters, and common ragweed—can become toxic if fields are fertilized or following drought conditions. These weeds take up excessive nitrogen and convert it to nitrate. If animals eat enough of these weeds (diet consists of at least 20%), nitrate toxicity can result. If this situation occurs, nitrate-accumulating weeds should be controlled before allowing animals to graze.

Yard waste/clippings. Many ornamental shrubs and plants are both palatable and highly toxic to livestock. Avoid feeding or dumping yard waste and clippings into pastures or animal holding areas, as this is one of the most common scenarios for livestock poisoning in the Midwest.

Unfamiliar pastures or other areas. Animals that have been recently shipped or are being boarded at a new location are often more susceptible to poisoning. When grazing a new area or newly seeded pasture, introduce animals gradually and monitor for any physical changes or changes in behavior.





Toxic plants in harvested forages. It is harder to control poisonous plants that might be present in purchased hay and also harder for animals to avoid dried and broken parts of poisonous plants. If feasible, scout the hay fields where your hay is harvested.

If you suspect plant poisoning

1. Remove animals from areas where the plants are present and remove any affected feed or forage. In the case of photosensitizing agents, get the animal into shade and treat any secondary infections.
2. **Contact your veterinarian!** Rule out other potential causes of death or disease and identify symptoms of toxicity. These will all help identifying the toxin and responsible plant(s).
3. Survey the area where the animals have been located recently to identify any plants that may be a potential source of toxicity. Don't forget to include fencerows and areas where animals may have access to nearby trees and shrubs. Learn to identify poisonous plants by capturing images of suspected plants using a digital camera and compare the images with online identification databases (weedid.wisc.edu) or published references. Unknown images can also be submitted to your county extension to confirm their identity (see Resources, p.37).

If taking plant samples for identification use gloves, and avoid contacting the specimen on the skin as some species can cause severe allergic reactions.

Be prepared to provide a general description of the environment including the source and availability of water, salt, and minerals and the presence of other materials, such as tree trimmings, old building materials, or any other items within the animals' reach that might also be a potential source of toxic compounds. Also consider recent weather conditions—such as frost or drought—as they can elevate toxicity in some plants.





Prevention is the best course of action

As is often the case, prevention is the best way to avoid toxicity problems in forages. We recommend:

1. Learning to identify poisonous plants and the conditions under which they can be dangerous to your livestock.
2. Frequently scouting your pastures on a regular basis; be sure to check fence lines and several feet beyond, waste areas, and ditches.
3. Control poisonous plants when they threaten livestock health.
Pest Management in Wisconsin Field Crops (A3646) is a good reference for herbicides that are labeled for use in pastures. Follow all label instructions when using pesticides.
4. Conduct proper pasture management. Rarely do toxic plants thrive in healthy pastures, therefore correct pasture management including fertilization, not overgrazing, and even renovation are critical! Developing a grazing plan will ensure a healthy and well-managed pasture which is the best way to prevent weed infestations (see Resources, p.37).

Alsike clover flowers



Alsike clover plants

Alsike clover

Trifolium hybridum

toxins	Unknown
species	Primarily horses, but other livestock species may exhibit photosensitivity
habitat	Pastures, waste areas, especially on poorly drained acidic soils
symptoms	Severe sunburn (photosensitivity), including reddening of the white skin areas on exposure to sunlight. Inflammation about the muzzle can extend into the mouth and tongue, resulting in ulcerations. A general swelling about the head may also occur. Other symptoms include aimless wandering, head pressing and liver damage.
toxic plant parts	Unknown, but it is believed to be present in all plant parts.
poison details	Toxicity and dose is unknown. Do not allow animals to ingest more than 20% of feed of this plant. Symptoms appear within 2 to 4 weeks of ingestion. It is believed to be associated with the presence of 'sooty blotch' fungus.

Black locust

Robinia pseudocacia

toxins	Robin robitin, robinine
species	Cattle, sheep, horses
habitat	Roadsides, open woods, fence rows
symptoms	Irregular heart rate, pale mucous membranes, light breathing, depression, abdominal pain, diarrhea, dizziness lack of awareness of surroundings. Death is not uncommon.
toxic plant parts	Leaves, seeds, and inner bark are all toxic, but bark and seed are the most poisonous. Palatability is low for this species.
poison details	As little as 0.1% of body weight eaten in bark can poison horses. Cattle are less susceptible.

Black locust seedpods



Black locust flowers

Boxelder leaves*Boxelder seed pods*

Boxelder

Acer negundo

toxins	Hypoglycin- A
species	Horses
habitat	Edges of woods, fence rows, and other areas that are not periodically mowed
symptoms	Associated with Seasonal Pasture Myopathy. Horses will appear stiff, have difficulty walking or standing, and may produce dark urine. In extreme cases, breathing may become rapid prior to horse death.
toxic plant parts	Seeds are toxic.
poison details	Poisoning occurs in the fall as seeds fall from trees. Level of toxin varies with time of year and possibly maturity of the seeds, but less than 200 seeds ingested have caused symptoms. Not all horses are sensitive, but younger horses are more likely to be affected. Susceptibility may be due to horses' willingness to eat seeds.

Bracken fern

Pteridium aquilinum

toxins	Thiaminase
species	Cattle, pigs, sheep, horses
habitat	Woods, shaded open areas
symptoms	Hemorrhaging from nose, mouth, or other mucous membrane, blood in urine or feces, high temperature, dizziness, weakness, blindness.
toxic plant parts	All plant parts are toxic. Young plants ('fiddle heads') are up to five times as poisonous as mature plants. Drying the plant parts does not reduce the toxicity of this plant. Palatability can be high as some animals may select this plant over other forage species.
poison details	Animals need to eat substantial amounts over at least a month for signs or symptoms to manifest. Mortality in cattle has been observed when 50% of their diet was bracken fern for greater than 30 days. Horses were poisoned when fed six pounds per day for one month.

Bracken fern plant



Bracken fern leaf detail

Buttercup plant



Buttercup flowers

Buttercups

Ranunculus spp.

toxins	Protoanemonin
species	Cattle, pigs, sheep, horses
habitat	Pastures, especially wet areas in the spring
symptoms	Reddening of oral mucous membrane, salivation, diarrhea. Bitter milk or blood in milk.
toxic plant parts	Fresh leaves, stems, and flowers are toxic. Toxicity is greatest when plants are flowering. Dried material is not toxic. Palatability is typically low, but animals can preferentially graze in some cases. Poisoning is most common in the spring.
poison details	Variable toxicity in plants prevent the ability to provide a specific amount that is toxic, but reports indicate that substantial amounts must be ingested. Can be fatal in sheep.

Cocklebur

Xanthium spinosum L. or stumarium L.

toxins	Glycosides
species	Cattle, pigs, sheep, horses
habitat	Cultivated fields, disturbed areas in or near pastures. Prefers sandy or wet soils.
symptoms	Convulsions, depression, reluctance to move, hunched back, blindness, recumbency, death.
toxic plant parts	Seedlings (to the 3 -leaf stage), fruit, and seeds are toxic, but palatability is low unless other food sources are not available. Mature plants lacking fruit/seeds are not poisonous.
poison details	0.75 to 3% of body weight eaten when plants are seeds or seedlings can result in death within 48 hours of symptoms.

Cocklebur leaves and pods



Cocklebur seedling

Hoary alyssum flowers



Hoary alyssum plant

Hoary alyssum

Berteroa incana

toxins	Unknown
species	Horses
habitat	Pastures
symptoms	Lameness, stiffness, limb swelling, fever, diarrhea, abortion, laminitis.
toxic plant parts	All parts of the plant are toxic. While the palatability is low, horses can graze hoary alyssum if desirable forage is not available. Toxicity does not diminish if dried.
poison details	Large amounts need to be ingested to cause toxicity. While mild conditions have been observed when less than 20% of forage consumed consisted of hoary alyssum, severe symptoms are common when this value is exceeded.

Horsenettle

Solanum spp.

toxins	Solanine, other glycoalkaloids
species	Cattle, pigs, sheep, horses
habitat	Overgrazed pastures, fence rows , waste areas, hay fields
symptoms	Depression, decreased heart and respiratory rate, muscle weakness, watery diarrhea, paralysis of hind legs ('sitting dog').
toxic plant parts	While all parts of the plant are toxic, leaves, stems and berries (seed) are most toxic in the fall. It is not clear if drying hay will reduce the toxicity of plant material. Palatability is extremely low due to the spiny nature of plants, but berries can be preferentially grazed.
poison details	Toxicity varies with plant parts and by time of year, but less than 1% of body weight of fruit ingested has resulted in death of horses. Cattle have been killed by eating dried berries that remain on the plant over winter. Symptoms can appear within 1 to 3 days of ingestion.

Horsenettle berries



Horsenettle plant with flowers

Horsetail plants



Horsetail stem

Horsetail

Equisetum spp.

toxins	Thiaminase
species	Sheep, horses
habitat	Wet or dry areas of pastures, roadsides
symptoms	Diarrhea, weight loss, hind leg incoordination, decrease in milk production.
toxic plant parts	All plant parts are toxic, whether green or dried. Palatability is low.
poison details	Hay that is 20% horsetail can cause symptoms if fed for several weeks. Continued ingestion for 1 to 2 months can cause death.

Jimsonweed

Datura stramonium

toxins	Atropine, scopolamine
species	Cattle, pigs, sheep, horses
habitat	Feeding areas and corrals that are heavily disturbed, cultivated fields
symptoms	Decreased respiratory and heart rate, muscle weakness, dilated pupils.
toxic plant parts	All parts are toxic, but seeds have the highest toxicity. Drying forage does not reduce toxicity of seed. Largest risk is from ingestion in contaminated hay due to extremely low palatability.
poison details	0.1 to 0.3% of body weight eaten results in poisoning. Larger amounts can be fatal. Symptoms are apparent within minutes to a few hours.

Jimsonweed plant



Jimsonweed flower

Young lambsquarter plant



Lambsquarter foliage and flowers

Lambsquarters

Chenopodium album

toxins	Nitrate
species	Cattle, pigs
habitat	Nearly any habitat in the Midwest, disturbed areas
symptoms	Perennial edema (kidney damage), drowsiness, weakness, muscular tremors, staggering gate, recumbency, abortion, sudden death.
toxic plant parts	Leaves and stems accumulate excessive nitrate, stems are most toxic. This plant is moderately palatable especially when vegetative.
poison details	Toxic amount dependent on nitrate level in plant tissue. Forage containing greater than 1.5% nitrate or 0.05% animal's weight of nitrate ingested can cause toxicity. Tissue can become high in nitrate after fertilization, during a drought, or following herbicide application. Dilute suspected high nitrate feed with known low nitrate sources to prevent symptoms.

Milkweeds

Asclepias spp.

toxins	Galitoxin, glycosides, alkaloids
species	Cattle, sheep, horses
habitat	Can inhabit a range of grasslands and pastures, spreads rapidly due to aggressive underground rhizomes and usually appears in patches.
symptoms	Depression, slowed respiratory rate, pain, inability to stand, tremors, staggering gate, weak and rapid pulse, colic, dilated pupils.
toxic plant parts	All plant parts are toxic and remain toxic even if forage is dried. Palatability is low in pasture, but can be eaten if baled or mixed with desirable forage.
poison details	0.05 to 5% of body weight eaten can be fatal. Toxicity varies with species, with narrow leaved species the most toxic. If eaten, can be fatal within 1 to 3 days.

Milkweed plant (broadleaf)



Milkweed plant (whorled)

Young nightshade plants



Nightshade plant with flowers

Nightshades

Solanum spp.

toxins	Solanine, other glycoalkaloids
species	Horses (very sensitive), cattle, pigs, sheep
habitat	Fence rows, waste areas, hay fields
symptoms	Depression, decreased heart and respiratory rate, muscle weakness, watery diarrhea, paralysis of hind legs ('sitting dog').
toxic plant parts	While all plant parts are toxic, unripe berries have the highest toxicity followed by green foliage. Toxicity can be reduced but not eliminated by drying forage. Palatability is low, but on occasion, animals (especially horses) can preferentially feed on berries.
poison details	Due to range of toxicities present in plants no estimate of toxicity is available. Symptoms can appear from 1 to 3 days after ingestion and result in death in severe cases.

Oaks

Quercus spp.

toxins	Gallotannins
species	Cattle, pigs, sheep, horses
habitat	Deciduous woods, fencerows, pastures
symptoms	Reduced appetite, depression, abdominal pain (evidenced by teeth grinding and hunched back), black and tarry diarrhea, liver and kidney damage, death.
toxic plant parts	All parts of plant are toxic, but the toxin is concentrated in young leaves and green acorns. While palatability is low, acorns can be eaten if other forage is not available, especially in the fall.
poison details	Large quantities ingested over time cause poisoning, though some cases report death after only hours of ingestion. Calves born to cows feeding on acorns can experience defects. Lactating cattle may have reduced milk production. The most common time of poisoning is the fall.

Green acorns of oak



Young oak leaves

Common waterhemp seedheads



Redroot pigweed seedheads

Pigweeds

Amaranthus spp.

toxins	Nephrotoxin, nitrate, soluble oxalates
species	Cattle, pigs, sheep, horses
habitat	Nearly any habitat in the Midwest, especially disturbed areas
symptoms	Perennial edema (kidney damage), drowsiness, weakness, muscular tremors, staggering gate, recumbency, abortion, sudden death.
toxic plant parts	All plant parts are toxic. This plant is moderately palatable especially when vegetative.
poison details	Dose dependent on level of toxic compound, but animals are required to consume substantial amounts of pigweed over several days to display symptoms within 3 to 7 days. See lambsquarter for information on nitrate toxicity.

Poison hemlock

Conium maculatum

toxins	Alkaloids
species	Cattle, pigs, sheep, horses
habitat	Roadside ditches, waste areas, disturbed pastures
symptoms	Salivation, abdominal pain, muscle tremors, incoordination, labored breathing, weak pulse, frequent evacuation.
toxic plant parts	While all plant parts are toxic, young leaves and seeds have the highest toxicity. Toxicity can be reduced but not eliminated by drying forage. Palatability is very low as plants are only eaten when other forage is not available.
poison details	Eating as little as 0.5% of body weight of hemlock can be fatal. Can cause skeletal defects in fetal calves if grazed by pregnant cows. Symptoms appear within 2 hours of ingestion; death occurs in 5 to 10 hours.

Poison hemlock plant



Poison hemlock stem

Prunus trees



Prunus flower clusters

Prunus species

Prunus spp.

toxins	Prussic acid (cyanide)
species	Cattle, pigs, sheep, horses
habitat	Fence rows, woods, waste areas
symptoms	Sudden death after 1 to 2 hours of rapid breathing, frothing at the mouth, dilated pupils, tremors, convulsions.
toxic plant parts	Leaves, twigs, bark, and fruit (seed) are all toxic. Leaf toxicity increases when wilted or damaged by frost. Palatability is low, unless other forage is not available.
poison details	One of the most common species (includes cherry and plum) that cause poisoning in Wisconsin pastures. Ruminants that eat less than 0.25% of their body weight in wilted green leaves are likely to die. Larger amounts can be tolerated, if leaves are not injured.

Red maple

Acer rubrum

toxins	Gallic acid
species	Horses
habitat	Planted ornamental tree
symptoms	Weakness, increased respiratory and heart rates, red-brown colored urine, fever, death. Mares may abort even without symptoms of anemia.
toxic plant parts	Dried leaves and bark are toxic, <i>green leaves are not toxic</i> . Toxicity of leaves increases as leaves dry but diminishes after 30 days. Leaves are readily eaten by horses.
poison details	As little as 0.3% of body weight of red maple eaten over 1 to 5 days can be fatal. The bark is also poisonous. Most poisoning occurs in late summer to fall.

Red maple tree



Red maple leaves

Sorghum plants



Sorghum seedheads

Sorghum, sudangrass

Sorghum spp.

toxins	Cyanide, excess nitrates
species	Cattle, sheep, horses
habitat	Primarily grown as an annual crop
symptoms	Excessive salivation, difficulty in breathing, rapid /weak pulse. Can lead to convulsions and coma/death within 10 or 20 minutes of onset of symptoms.
toxic plant parts	Leaves and stems are toxic, but levels are highest during a drought or after a frost. Certain varieties contain lower levels of cyanide.
poison details	As little as 5 pounds of the plant ingested for cattle and 1 pound for sheep can be toxic. Avoid grazing/feeding the top 2 feet of forage, if conditions exist. Planting varieties that do not accumulate high levels of cyanide is recommended.

Spotted water hemlock

Cicuta maculata L.

toxins	Cicutoxin
species	Cattle, pigs, sheep, horses
habitat	Wet areas, including ditches, pond edges, swamps
symptoms	Initial symptoms include salivation, muscle twitching. Can progress to seizures and even death.
toxic plant parts	All plant parts are poisonous. Roots, seeds, and the lower stem are the most toxic. Leaves and stems lose toxicity as they mature, but roots are toxic year-round. Roots are palatable, but other plant areas are avoided unless forage is limited. Toxicity can persist as plant parts dry, especially in roots.
poison details	Ingesting as little as 8 ounces of this plant can result in death within hours.

Spotted water hemlock flowers



Spotted water hemlock leaves

St. Johnswort flowers



St. Johnswort plant

St. Johnswort

Hypericum perforatum

toxins	Hypericin
species	Cattle, pigs, sheep, horses
habitat	Sandy soils, roadsides, pastures
symptoms	Photosensitivity (blisters, edema, scabs, redness, peeling), intense itching, swollen eyelids, blindness, starvation, fever, increased heart rate and respiration, diarrhea, shade seeking.
toxic plant parts	All parts of the plant are toxic. Drying forage infested with St. Johnswort does not reduce toxicity. Palatability of this species is low and generally is avoided unless other forage is not available.
poison details	Toxic dose varies depending on the environment and complexion of the animals (light skinned 1% of total forage ingested, dark skinned up to 20%). Symptoms develop within 2 to 21 days.

Sweetclover

Melilotus spp.

toxins	Dicoumaral (produced by the Fungi (mold) that grow on sweetclover)
species	Cattle, horses
habitat	Roadsides, waste areas, pastures
symptoms	Dull and stiff composure, reluctance to move, marked swellings, pale mucous membranes, rapid pulse/respiration, bleeding from the nose. Signs of poisoning may not appear for up to 3 weeks after feeding moldy sweetclover hay. Death may occur suddenly or after several days.
toxic plant parts	All aboveground parts that can be infected by a fungi after harvested (mold). Toxicity does not diminish as forage is dried.
poison details	Level of poisoning depends on the amount of toxin produced by the fungi and the duration of feeding. Avoid feeding moldy sweetclover to animals. Symptoms can occur within 10 to 21 days. Sweetclover without mold is safe for consumption.

Sweetclover flowers



Sweetclover plants

Tall fescue plants



Tall fescue leaf collar

Tall fescue

Festuca arundinacea

toxins	Ergot alkaloids from the fungal endophyte (ergovaline)
species	Cattle, horses
habitat	Common forage grass, included in many pasture/roadside mixes
symptoms	Restricted blood flow (resulting in higher body temperature), reduced feeding, weight loss, lactation failure or deficiency, difficulty foaling. Severe cases will result in lameness, hoof loss, and failure to shed the winter coat.
toxic plant parts	While all plant parts are toxic, flowers/seeds are of greatest concern. Toxicity persists if forage is dried.
poison details	Feed that contains as little as 10% of endophyte-infected tall fescue causes toxicity in horses. Poisoning can occur anywhere from 8 days to 6 months after ingestion. Horses are most severely affected. Varieties that do not contain toxic endophytes are available.

White snakeroot

Eupatorium rugosum

toxins	Tremetol
species	Cattle, sheep, horses
habitat	Woods, cleared areas, moist, rich soils
symptoms	Listlessness, depression, lethargy, hesitation to move, muscle tremors (especially common in cattle), difficulty swallowing, choking.
toxic plant parts	All plant parts are believed to be toxic, but may be less in roots. While drying forage can reduce toxicity, substantial amounts still remain toxic.
poison details	Eating 1-10% of body weight as green plants. If livestock show 'trembles,' death is likely. Toxin is secreted in milk and can poison calves and humans. Symptoms can appear within 1 to 2 days or much longer depending upon the amount ingested.

White snakeroot plants



White snakeroot flowers

Young wild parsnip plant



Flowering wild parsnip

Wild parsnip

Pastinaca sativa

toxins	Furanocoumarin
species	Horses, cattle
habitat	Roadside ditches, pastures
symptoms	Severe sunburn (photosensitivity)
toxic plant parts	All plant parts are toxic, palatability is high. <i>Drying forage does not reduce toxicity.</i>
poison details	Toxic dose not yet determined, but large amounts (less than 20% of feed ingested) need to be ingested to cause a response. Symptoms can vary depending upon the complexion of animals (lighter skinned more sensitive).

Yew

Taxus spp.

toxins	Taxine
species	Cattle, sheep, horses
habitat	Planted ornamental tree/shrub
symptoms	Irregular heart rates, gastric distress, diarrhea, vomiting, tremors, convulsions. Death is often so rapid that symptoms do not appear.
toxic plant parts	Leaves, flowers, and fruit are highly toxic. Palatability of leaves and fruit are low, unless limbs have been cut and placed in pasture, or after a frost.
amount necessary for poisoning/ comments	Less than 1% of body weight eaten can be fatal. Palatability can increase if leaves wilt.

Yew berries



Yew leaves and fruit



Table 1. Grazing and harvesting restrictions for herbicides used in pastures.

We recommend a 14-day waiting period after herbicide application, even if not required by the label. Consult the label for specific restrictions, as interval depends on the animal, herbicide rate, or use pattern.

Herbicide	Grazing/harvesting restrictions
Chaparral	0 days
Clarity	7–40 days, depending on rate
Crossbow	14 days to entire season
Curtail	0–14 days
Escort	0 days
GrazonNext	0–7 days
Glyphosate	0–7 days
Milestone	0 days
Stinger	0 days
2,4-D	3–7 days

Resources

Publications

A Guide to Plant Poisoning of Animals in North America

A. P. Knight and R. G. Walter, Teton NewMedia, 2001

Poisonous Plants of Pennsylvania

Robert J. Hill; Commonwealth of Pennsylvania

Department of Agriculture, 1986

Poisonous Plants of the Central United States

H. A. Stephens, University Press of Kansas, 1980

<http://www.kansaspress.ku.edu/order.html>

Pasture Plants Toxic to Livestock in Michigan (E-1725)

Alice Marczewski, Cooperative Extension Service,

Michigan State University, 1983

Sampling Soils for Testing (A2100)

University of Wisconsin Extension, Cooperative Extension

[http://learningstore.uwex.edu/Sampling-Soils-for-](http://learningstore.uwex.edu/Sampling-Soils-for-Testing-P183.aspx)

[Testing-P183.aspx](http://learningstore.uwex.edu/Sampling-Soils-for-Testing-P183.aspx)

Websites

Extension offices (to find your local office)

<http://www.csrees.usda.gov/Extension>

Guide to Poisonous Plants, Colorado State University

http://www.vth.colostate.edu/poisonous_plants/

Harmful Plant Gallery, Rutgers Cooperative Extension

www.rce.rutgers.edu/harmfulplants/default.asp

Plants Poisonous to Livestock, Cornell University

<http://www.ansci.cornell.edu/plants/>

Toxic Plants by Degree of Toxicity, Purdue University

[https://www.extension.purdue.edu/extmedia/ws/](https://www.extension.purdue.edu/extmedia/ws/ws_37_toxicplants08.pdf)

[ws_37_toxicplants08.pdf](https://www.extension.purdue.edu/extmedia/ws/ws_37_toxicplants08.pdf)

Copyright © 2017 by the Board of Regents of the University of Wisconsin System doing business as the division of Cooperative Extension of the University of Wisconsin-Extension. All rights reserved.

Authors: Anders Gurda, research assistant, UW–Madison Department of Agronomy; Peg Reedy, Walworth County UW-Extension agriculture agent; Mark Renz, UW-Extension weed scientist. Cooperative Extension publications are subject to peer review.

Photo credits: Unless noted, photos provided by authors and Mimi Broeske, University of Wisconsin Nutrient and Pest Management Program.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, the University of Wisconsin-Extension, Cooperative Extension provides equal opportunities in employment and programming, including Title VI, Title IX, and ADA requirements. To obtain this information in another format or submit a copy request, please contact Cooperative Extension Publishing at 432 N. Lake St., Rm. 227, Madison, WI 53706; pubs@uwex.edu; or (608) 263-2770 (711 for Relay).

This publication is available from your county UW-Extension office (www.uwex.edu/ces/cty) or from Cooperative Extension Publishing. To order, call toll-free 1-877-947-7827 or visit our website at learningstore.uwex.edu.