

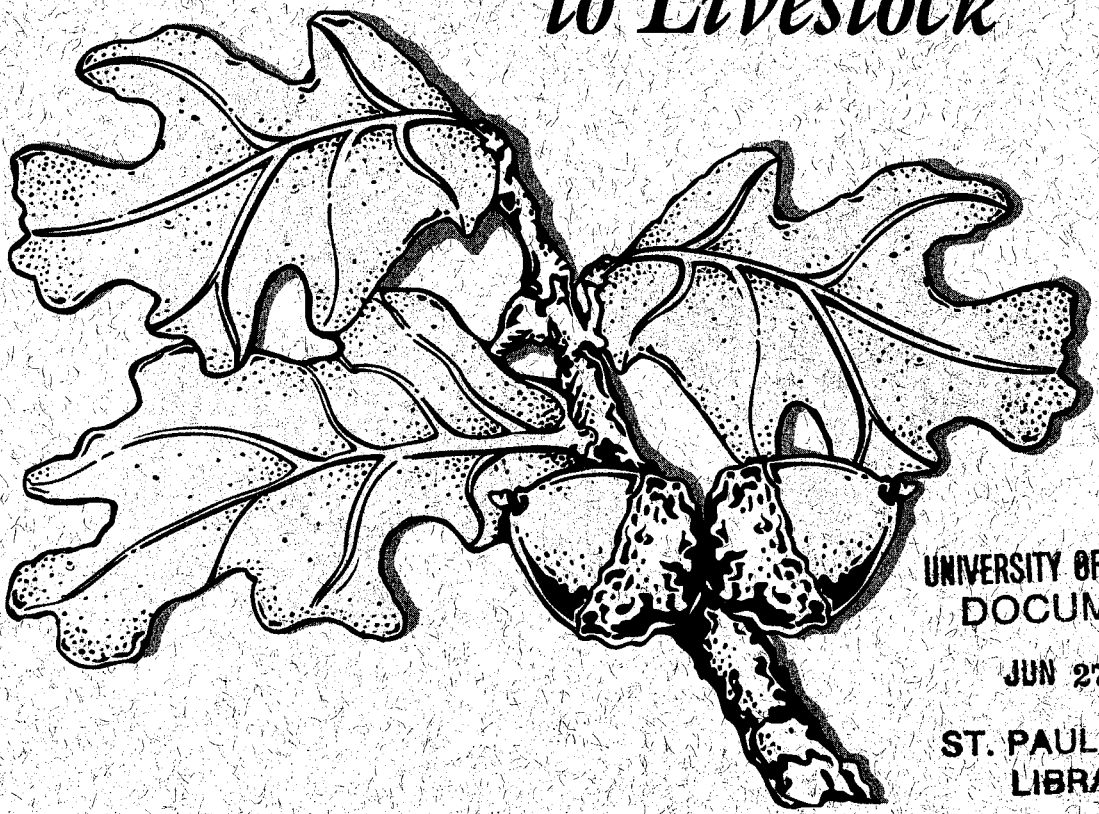
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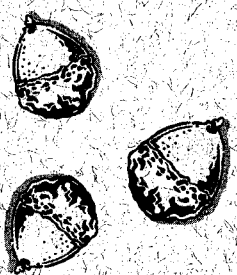
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Plants Poisonous to Livestock



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Plants Poisonous to Livestock

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Edited by Joe Kurtz Publication design by Tracey J. Benson

Recognition of poisonous plants and the proper management of animals and pastures will help to minimize the potential for poisoning animals from poisonous plants.

When an animal goes off feed, loses weight or appears unhealthy, poisonous plants may be the cause. Poisonous plants contain toxic substances which can injure animals. Some plants contain substances that can kill, even in small doses. Others contain substances that cause a reduction in performance, such as weight loss, weakness, rapid pulse and unthriftiness. Poisonous plants should be given consideration as the potential cause, especially if the following situations exist.

- a) Forage supply in a pasture is sparse due to overgrazing, drought or poor early season growth.
- b) Animals have recently been moved into a new pasture.
- c) Animals have been released into a new pasture when hungry.
- d) Herbicides have been used to control weeds.
- e) Pasture has recently been fertilized with nitrogen.
- f) A new forage source has been fed.

Most poisonings occur in the early spring or during a drought when feed is short. Plants that an animal normally would not eat become a potential source of food and a potential source for poisoning, just because the animal is hungry and in search of food.

Some herbicides may increase the palatability of some weeds. Therefore, it is important to read the herbicide label and follow all grazing restrictions. Also, if there are poisonous plants in the pasture, it is best to keep all livestock out until the plants have completely died.

In Minnesota, the number one cause of poisoning in cattle is nitrate poisoning. Nitrates can accumulate in certain plants when grown under drought stress and/or after application of nitrogen fertilizer. The crops sorghum-sudangrass, corn and the weeds redroot pigweed and common lambsquarters cause much of the nitrate poisoning. Sorghum-sudangrass hybrids have been the number one cause of nitrate poisoning in Minnesota.

The other main causes for cattle poisoning in Minnesota rank as follows:

- 1) Gallotannins in oak species, mainly in southeastern Minnesota.
- 2) Cyanide poisoning caused by sorghum species and by choke-cherry plants.
- 3) Glycoside poisoning from nightshades and cocklebur.
- 4) Photosensitive skin reactions from St. Johnswort and buckwheat.
- 5) Cicutoxin poisoning from spotted water hemlock.
- 6) Alkaloid poisoning from poison hemlock.

The main two causes of plant poisonings in sheep in Minnesota have been nitrate poisoning and photosensitive reactions.

In horses, the number one poisoning problem has been from maple tree leaves. During 1988-1989, 12 to 15 cases of horse poisoning occurred in Minnesota. The plants which rank next in poisoning of horses are hoary alyssum and white snakeroot. Hoary alyssum, when greater than 30% of the feed source, has been linked to stocking up (swelling of the lower legs) and other problems in horses. White snakeroot has caused death.

Other less common plants causing livestock poisonings are spotted water hemlock, poison hemlock, brackenfern and the nightshades.

The key to avoiding problems with poisonous plants is proper identification and avoidance of these plants. Become familiar with the plants that can cause problems. Examine pastures, hay fields, roadsides and fence rows for poisonous plants. In a drought year or a year when feed is short, take extra precautions to inspect new areas planned for grazing or haying such as roadsides, wooded areas or sloughs. Animals, under conditions of adequate feed, will avoid most poisonous plants. However, when feed is short, or animals are hungry, plants normally avoided become a tempting source of feed, and thus a potential poisoning problem.

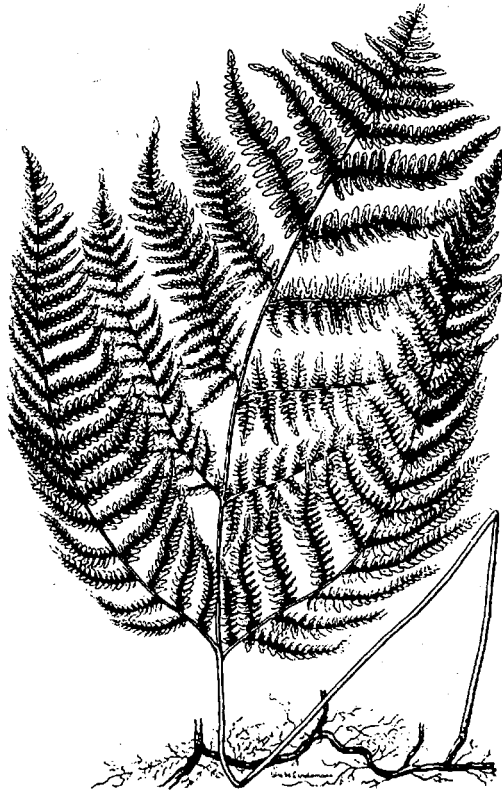
This bulletin identifies and describes many of the poisonous plants in Minnesota. It describes their appearance, where they grow, the parts of the plant that are poisonous and when they are most poisonous. It also describes poisoning symptoms and names some of the toxic compounds present in the plant. Knowing how to correctly identify poisonous plants will help prevent potential problems and perhaps death of an animal. Other management tips to avoid problems include:

1. Avoid overgrazing pastures.
2. Avoid turning hungry animals into new pastures.
3. Learn to identify poisonous plants.
4. Fence off areas in pastures where poisonous plants occur.
5. Control and/or manage plants to avoid poisoning problems.
6. Follow herbicide grazing restrictions.
7. Rotate pastures to prevent overgrazing.
8. Provide adequate supplies of clean, fresh water for livestock.
9. Consult your veterinarian to correctly identify a suspected poisoning from plants, in order to prevent it from happening in the future.

Table 1 contains information to help you identify poisonous plants and recognize signs of poisonings. Table 2 lists other references that may also be helpful in identification and control of poisonous plants.

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Brackenfern

(Pteridium aquilinum)

Brackenfern is a perennial reproducing by spores and thick, scaly underground rhizomes. It usually is found growing in colonies. On established plants, leaves (fronds) arise directly from the rhizomes and reach a height of one to four feet. The leaf is three-parted or branched, and each leaf is composed of many tiny leaflets. The three-parted leaf is a characteristic of this plant distinguishing it from other ferns. Spores are borne on the underside of each leaflet in a narrow band on the leaf margins.

Butterfly Milkweed

(Asclepias tuberosa)

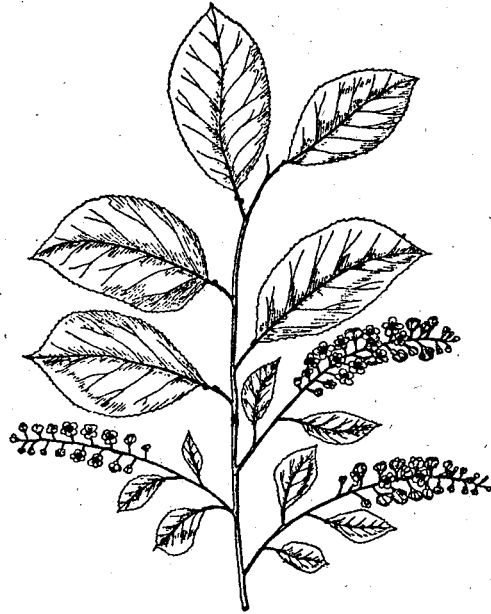


Butterfly milkweed is the most poisonous of the plants in the milkweed family. It is a perennial, reproducing by rootstalks and seeds. Stems are stout and terminally branched. They are generally clumped and may reach two feet tall. Stems contain a watery juice rather than a milky juice found in other milkweeds. Leaves are lance-shaped with pointed tips, six inches long and alternate along the stem. Flowering occurs from June to September. Flowers are brilliant orange, red or yellow and are arranged in rounded bunches at the top of the plant. One to two spindle-shaped pods, three to five inches long, are produced per plant, each containing many seeds. Pods split open in the fall to release the seeds. A silky plume on the top of each seed provides for easy wind distribution.

Choke-cherry

(Prunus virginiana)

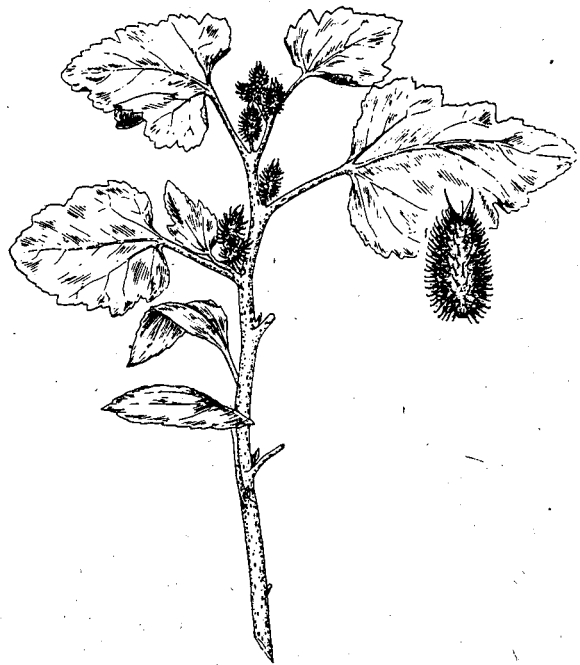
Choke-cherry grows as a large shrub or small tree from four to twenty-five feet tall. Bark is gray to brown, smooth to somewhat scaly. Leaves are alternate, ovate shaped, one to three inches long, one and one-half inches wide, and sharply toothed. Flowers are white or pink, produced in clusters two to three inches long. Fruits are like small cherries, red at first, turning purple to black at maturity. Twigs give off a strong odor when crushed.

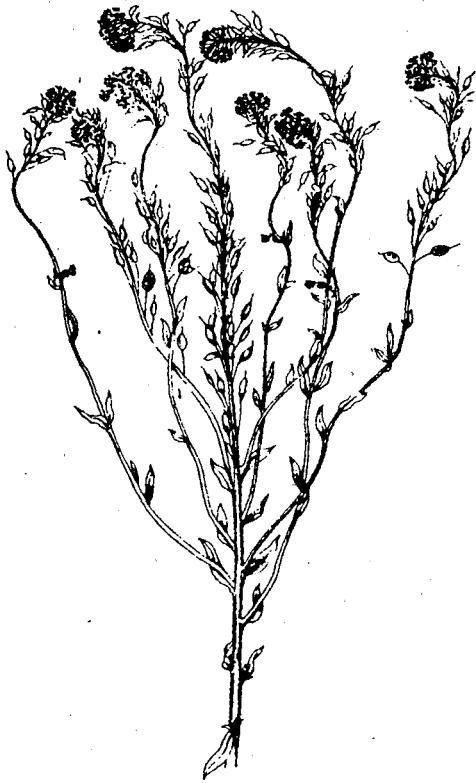


Cocklebur

(Xanthium strumarium)

Cocklebur is an annual plant, reproducing only by seeds. The root is a taproot, woody and stout. Stems are hairy, rough to the touch, erect and reach two to four feet tall. Stems are branched and frequently spotted with red. Leaves are alternate and attached to stems by long stems, are simple and vary from heart-shaped to kidney-shaped. The leaf surface is hairy and rough to the touch. Flowers are small and green, borne together in clusters in the axils of the upper leaves. Fruit is a two-seeded bur which is hard, woody and covered with hooked spines. Cocklebur seedlings have long, narrow cotyledons which taper to a point at the tip. Seedling/cotyledons tend to be triple veined at the base, reach a length of about three inches, are sessile and covered with rough hairs. The first leaves are opposite, triple veined at the base, with prominent veins and are covered with rough hairs. Later emerging leaves are alternate.

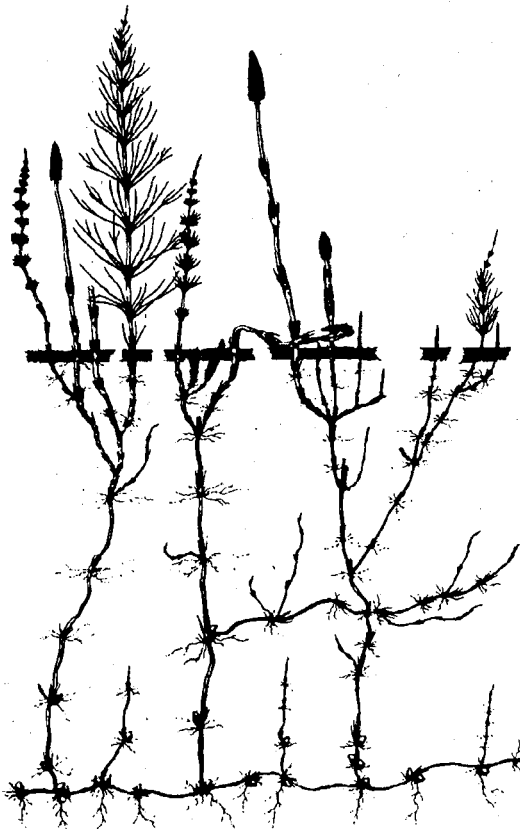




Hoary Alyssum

(*Berteroa incana*)

Hoary alyssum can grow as an annual, biennial or short-lived perennial, reproducing by seeds. Stems are gray-green, hairy, one to three feet tall, with many branches near the top. Leaves are alternate, oblong, gray-green and covered with rough hairs, and are one-half to three inches long with smooth edges. Flowers are white with four deeply divided petals. Seed pods are hairy, oblong and swollen, with a short beak on the end.



Horsetail

(*Equisetum arvense*)

Horsetail is a perennial, reproducing by spores and creeping rhizomes. The rhizomes are attached to tiny underground tubers. The plant has two forms; vegetative and reproductive. The vegetative form produces shoots that can reach up to two feet tall. The shoots are jointed, and have whorled branches at each joint. Branches are jointed and look somewhat like a coarse elongated pine needle. The plant resembles a small evergreen tree. The reproductive form is a rush-like plant. Shoots are hollow, jointed, branchless and leafless, with a toothed sheath at each node. The fruiting heads contain masses of tiny, pale greenish spores in a pine cone-like structure.

Nightshade Family

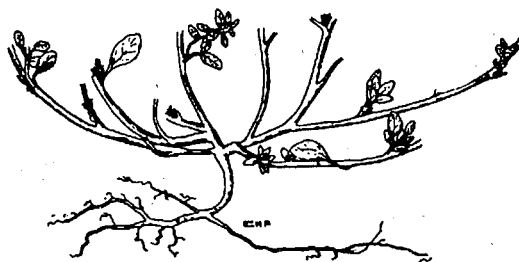
(Solanum species)

Nightshades are mostly annuals, reproducing by seed. Stems are erect or spreading, becoming widely branched, growing one to two feet tall. Leaves are egg-shaped, one to three inches long, alternate, with wavy edges. Flowers occur in small clusters, white, five-lobed and about one fourth inch across. The plants produce berry-like fruit. Berries are smooth, three eighths inch in diameter, green in color, turning black at maturity, and contain numerous seeds.



Nitrate Accumulators

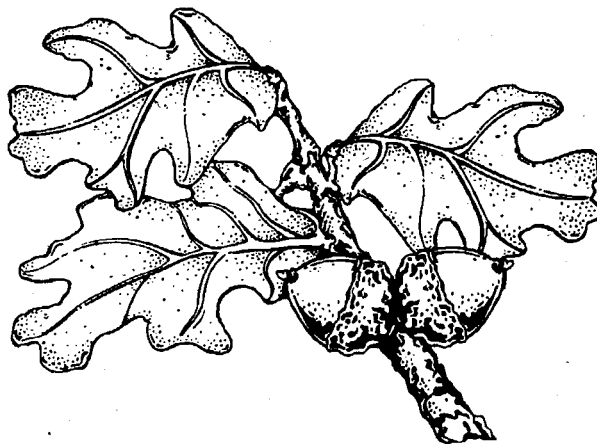
Pigweeds and lambsquarters are annual weeds common throughout the United States. They will accumulate nitrates when grown under drought stress and high nitrogen fertility. Grasses, such as corn, sorghum and sorghum-sudans, will also accumulate nitrates when grown under similar conditions.



Oaks

(Quercus spp.)

Oaks are perennial shrubs to large deciduous trees. Leaves grow in clusters of two to four leaves at the tips of all twigs. Most species can cause livestock poisonings. Gamble and shinny oak are responsible for most livestock poisonings. Bur oak has deeply furrowed bark with deeply lobed leaves, ten inches long. Upper surfaces of the leaves are dark green; undersides are silver and hairy. Pin oak, red oak and white oak are also common oak species found in the upper Midwest region of the United States.





Poison Hemlock

(Conium maculatum)

Poison hemlock is a biennial, reproducing only by seeds. A basal rosette forms the first year, followed by an erect, flowering stalk the second year. Taproot is fleshy, parsnip-like and the biennial roots resemble small white carrots. Stems are erect, hollow between the node, hairless and reach a height of two to seven feet. The stem is much branched, slightly grooved and is often spotted with purple. Leaves are alternate, large, four to five times compound, finely divided and toothed, with lacey appearance, and are smooth and dark green in color. When crushed, leaves give off a parsnip odor. Flowers are borne in large, terminal, flat-topped to slightly convex umbels. Petals are white and appear from mid-summer through mid-autumn.



Smallflower Buttercup

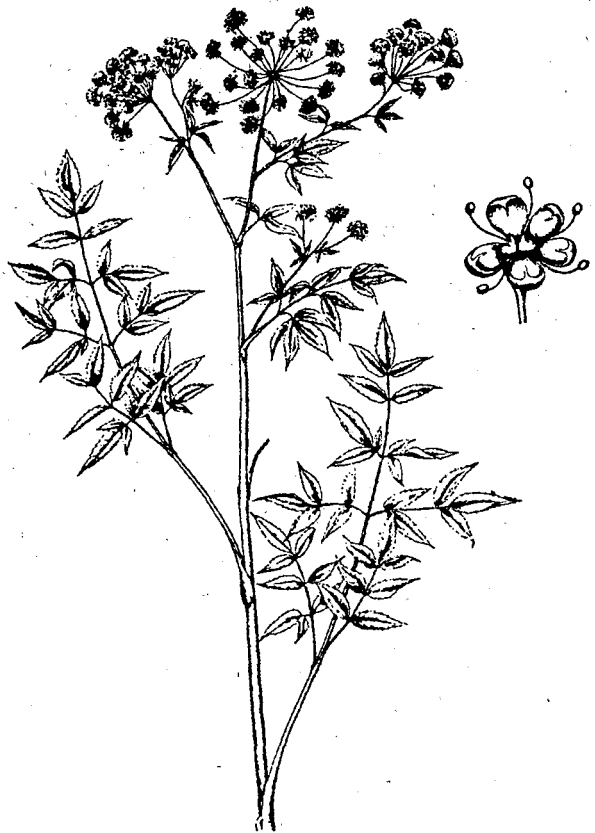
(Ranunculus abortivus)

Smallflower buttercup grows as an annual or biennial, reproducing by seed. Stems are slender, slightly hairy, branched from the base, reaching six to twenty inches tall. Lower leaves are round, palmately veined, bright green, with round-toothed margins, and are borne on long stems arising from the base of the plant. Upper leaves are borne on shorter stems, alternate, and divided into three to five leaflets with somewhat toothed margins. Flowers are small, yellow, with five to seven oblong petals.

Spotted Water Hemlock

(Cicuta maculata)

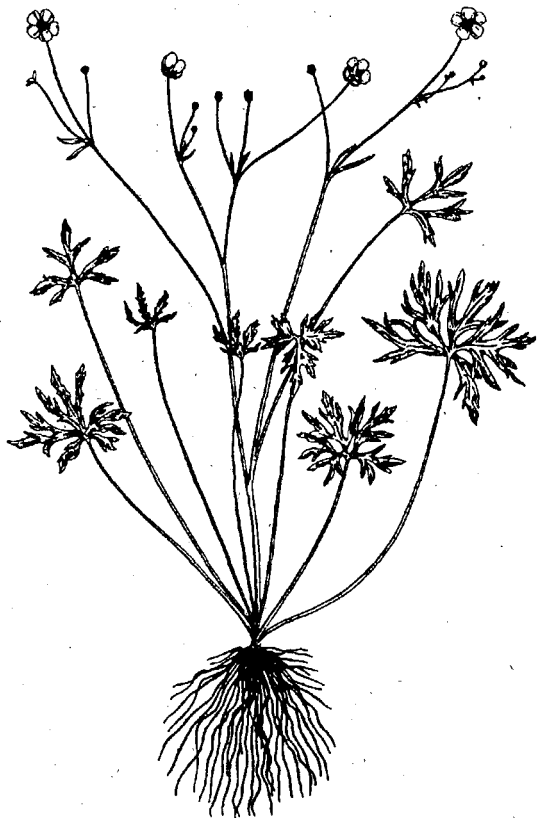
Spotted water hemlock is a perennial, reproducing by seeds and tuberous roots. Fleshy roots arise from a chambered rootstalk. Perennial roots consist of a bundle of several fingerlike, white tubers that are easily pulled from the soil. Stems are erect, two to six feet tall, branched at the top, hollow inside except at the nodes. Stems are smooth and often mottled with purple, especially at the base. Roots and stems may produce a yellowish oil when cut that is fragrant and poisonous. Leaves are alternate, eight to twelve inches long, compound and smooth with toothed edges. Veins on the leaflets end in the notches. Leaves are divided into three groups of leaflets per leaf. Leaf stalk grasps the stem like a celery bunch. Crushed leaves and stalks smell like parsnips or parsley, sometimes unpleasant. Flowers have five small, white petals and are borne in compound terminal umbels with stalks of unequal length.



Tall Buttercup

(Ranunculus acris)

Tall buttercup is a perennial, reproducing by seeds. Stems are erect, hairy, one to three and one-half feet tall, branching at the top. Leaves are alternate, and divided into narrow segments and usually three-cleft. Leaves are covered with hairs. Flowers have five to seven shiny, oblong petals that are bright yellow, but may sometimes be cream-colored. Flower size varies from one-eighth to one inch in diameter.





White Snakeroot

(Eupatorium rugosum)

White snakeroot is a perennial, reproducing by seeds and short rhizomes. The roots are much branched and fibrous. Stems grow from one to three feet tall and are smooth and erect, branching at the top. Leaves are opposite, three-veined with toothed edges and taper to a pointed end. Flowers are small and white and generally appear in late August.

Glossary

Alternate (leaf arrangement): One leaf attached at each stem node.

Annual: A plant that completes its life cycle in one year or less, and reproduces only by seed.

Biennial: A plant that completes its life cycle in two years, and reproduces only by seed.

Compound (leaf type): A leaf divided into two or more distinct leaflets.

Cotyledons: Seed leaves; the first leaflike structures appearing above the ground in broadleaf plants.

Opposite (leaf arrangement): Leaves attached in pairs at each stem node.

Perennial: A plant that may live for more than two years, and reproduces by seeds, rhizomes or other underground plant parts.

Photosensitization: An increase in sensitivity to sunlight, resulting in sunburned skin when exposed to ultraviolet light.

Rhizome: An underground stem; found on perennial plants.

Rosette: A basal cluster of leaves, like a dandelion. The first year's growth of biennial plants.

Stocking Up: Swelling of any of the lower legs because of interference with circulation or bruising of the tissues.

Table 1. Poisonous plants found in Minnesota

Plant	Conditions of Poisoning	Habitat	Animals	Symptoms of Poisoning
Brackenfern	All season and when dried in hay	Dry, poor soil, open woods, pastures and sandy ridges. Found in northern half of Minnesota.	All grazing animals	Cattle, accumulative poisoning over at least 1 month. Clots of blood in feces, swelling of throat region in young animals. Causes aplastic anemia. Unthriftiness, weight loss and weakness. Horses, loss of appetite, "star-gazing" Vitamin B1 deficiency.
Buttercups	Early spring and summer. Not toxic when dried in hay.	Pastures, meadows, streams, and wastelands. Mostly found in the northern half of Minnesota.	All animals, especially cattle	Leaves cause skin blistering minutes to a few hours after eating. Burning irritation in mouth and throat, followed by increased salivation, redness and blistering of the mouth and throat. Swallowing causes abdominal pain, vomiting and diarrhea. Large amounts cause dizziness, delirium, tremors and convulsions. May also cause kidney damage, excessive urine production, blood in urine followed by a decrease in urine flow. Lactating cattle suffer a drop in milk production and milk is bitter and red tinted. Sheep may collapse suddenly. Pigs may show paralysis. Toxin is an acrid yellow oil, protoanemonin, which can be driven off with drying, such as when cured for hay.
Butterfly Milkweed	Spring	Dry open areas, waste places, prairies, abandoned roads and streambeds. Found throughout Minnesota.	All grazing animals	Loss of muscle control, spasms, bloating, increased pulse rate, weak rapid breathing, fever, coma, and death. Symptoms occur within one to two days after eating. Toxin is a resinoid, galitoxin. Also contains glucosides and alkaloids.
Choke-cherry	All season leaves, bark and seeds.	Along streams and open forests, waste areas, fence rows, woods, prairies, orchards and dry slopes. Found throughout Minnesota.	All grazing animals	Slobbering, muscle tremors, increased respiration rate, rapid and weak pulse, convulsions, labored breathing, abdominal pain, depression, paralysis, coma and death. Symptoms noticed in 30 minutes to 1 hour. Caused by glycoside amygdalin which upon hydrolysis yields HCN.
Cocklebur	Spring as seedlings, especially 2-leaf (cotyledon) stage.	Lowlands, barnyards, fields, roadsides, poor pastures, wastelands, exposed shores of lakes, ponds and rivers. Found throughout Minnesota.	All animals, especially hogs & cattle	Loss of appetite, depression, uncoordination, twitching, paralysis. Seedlings have caused death in pigs. Caused by hydroquinone. Symptoms noticed a few hours to 2 days after eating. Death may occur in 3 days.
Hoary Alyssum	All season and when dried in hay.	Meadows, pastures, hay fields, waste places, particularly on sandy soils. Found throughout Minnesota.	Horses	Horses experience depression and "stocking up" or swelling of the lower legs, 12 to 24 hours after eating. A fever and occasional short term diarrhea may also occur. Symptoms normally subside 2 to 4 days after feed removal. Potential for problems increase when hay or feed contains more than 30% hoary alyssum. Cattle and sheep may reject eating feed containing hoary alyssum.
Horsetail	Spring, summer and when abundant in hay.	Damp, wet places, roadsides, fields, waste places. Sandy, gravelly soils. Found throughout Minnesota.	Sheep Cattle Horses	Loss of condition, excitability, unthriftiness, staggering gait, rapid pulse, difficult breathing, diarrhea and emaciation. Death preceded by convulsions and coma. Decreased milk production in cows. Trembling in sheep. Poisoning accumulative over one month.

Plant	Conditions of Poisoning	Habitat	Animals	Symptoms of Poisoning
Nightshade family	Summer and fall. Unripe berries especially poisonous.	Crop fields, waste places, fence rows, yards, gardens and open woods. Grows well on loamy or gravelly soils. Found throughout Minnesota.	All animals	Weakness, trembling, labored breathing, nausea, constipation or diarrhea, death. First symptoms may be paralysis of tongue and dilated pupils. Symptoms occur within a few hours or up to 1 to 2 days after eating. Toxin is glycoalkaloids.
Nitrate accumulators	Especially a problem when plants are grown under drought stress and high N fertility.	Pigweeds, lambsquarters, corn, sorghums, and other grasses.	All grazing animals	Increased salivation, labored breathing, incoordination, weak pulse, muscle tremors, vomiting, diarrhea, suffocation, death. Symptoms 2 to 6 hours after eating.
Oak	Bud and leafing out stage. Young oak and sprouts. Declines as leaves mature. Acorns.	In most deciduous woods. Found throughout Minnesota.	All grazing animals	Loss of appetite, constipation, dry muzzle, black, pelleted feces followed by diarrhea with blood and mucus. Frequent urination, weak, rapid pulse. Death may occur a few days to 2 weeks after symptoms start. Caused by gallotannins.
Poison Hemlock	All parts, all season and when dried in hay. Seeds especially poisonous.	Wet, disturbed ground like ditches and field edges. Warm sites, stream edges and gardens. Found throughout Minnesota.	All animals	Loss of appetite, salivation, bloating, feeble pulse, paralysis, birth defects. Temporary stimulation of nervous system, followed by general depression of the nervous system. Similar symptoms as spotted water hemlock, no convulsions. Death painful because victim remains conscious. Symptoms occur in minutes to a few hours after eating. Death occurs as soon as 15 minutes up to 8 hours after eating. Toxin is a group of nicotine-like alkaloids; most important is coline.
Spotted Water Hemlock	All parts poisonous, especially roots. Roots can poison drinking water. All season and when dried in hay.	Damp, open habitats, ditches, wet meadows, swamps, lowlands and streams. Found throughout Minnesota.	All animals, especially swine	Burning sensation in mouth a few minutes to a few hours after eating. Difficulty in swallowing, foaming at the mouth, excessive salivation, dilation of the pupils. Internal symptoms--nausea, diaphragm contractions, vomiting, diarrhea, violent convulsions. Affects nervous system, resulting in nervousness, muscle twitching, violent teeth clenching, slowing of the heart, weak pulse, visual disturbances, heart failure, loss of consciousness and death. Occurs in 15 minutes to 1 hour. Poison is an unsaturated alcohol, cicutoxin. A piece the size of a walnut can kill a cow.
White Snakeroot	All season and when dried in hay.	Shaded areas, woods, clearings, hardwood pastures and waste places. Moist and fertile soils. Found throughout Minnesota.	All grazing animals	Plant contains tremetone, which causes depression, labored breathing, tremors, nausea and death. Milk sickness in cattle. Tremetol may be transmitted through the milk and butterfat to humans and other animals, causing milk sickness in them. Causes trembles in sheep. Onset of symptoms noticed 2 to 3 days after eating.

Table 2.
References for Identification and Control of Poisonous Plants

- Berndt Bergland and Clare E. Bolsby. *The Edible Wild*. 1971. Charles Scribner's & Sons Publishing.
- Edited by Nina L Etkin. *Plants in Indigenous Medicine and Diet Biobehavioral Approaches*. 1986. Redgrave Publishing Company, New York.
- Edited by Richard F. Keeler, Kent R. VanKampen, Lynn F. James. *Effects of Poisonous Plants on Livestock*. 1978. Academic Press, New York, London and San Francisco.
- Thor Kommedahl and Herbert G. Johnson. *Pesky Plants*. Minnesota Extension Bulletin AG-MI-3733. Revised 1989.
- Charles Lingsley Levy and Richard B. Primack. *A Field Guide to Poisonous Plants and Mushrooms of North America*. 1984. Boston University. The Stephen Greene Press.
- Alice E. Marczewski. *Pasture Plants Toxic to Livestock in Michigan*. Michigan State University Extension Bulletin E-1725. 1983.
- Frank B. Morrison. *Feeds and Feeding*. 22nd edition; 1959. Morrison Publishing Company.
- North Central Regional. *Weeds of the North Central States*. Research Publication No. 281. 1981.4.
- Sylvan T Runkel and Dean M. Roosa. *Wildflowers of the Tallgrass Prairie. The Upper Midwest*. Iowa State University Press, 1989.
- O.A. Stevens and Larry W. Mitch. *Plants Which May Be Poisonous*. North Dakota State University Circular A-471. 1977.
- Edited by Malcolm Stuart. *VNR Color Dictionary of Herbs and Herbalism*. Published by Van Nostrand Reinhold Company 1982.
- USDA. *16 Plants Poisonous to Livestock in the Western States*. Farmers Bulletin No. 2106. 1958. Washington D.C.

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