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Red maple trees

ID: A medium-sized tree with leaves that are green in the spring and summer, with shallow notches, bright red stems and a whitish underside; in fall, the leaves turn bright red. The bark is smooth and pale gray on young trees, and becomes dark and broken on older trees.

Range: The native range is eastern North America, from Canada to Florida and west to Minnesota and eastern Texas, but ornamental specimens have been planted all over the country.

The danger: Ingestion of fresh, growing red maple leaves seems to do little or no harm, but when the leaves *wilt* they become extremely toxic to horses. Access to wilted leaves is most common after storms, which may cause branches to fall into pastures, or in the autumn when the leaves fall and are blown into grazing areas. The toxins in wilted red maple leaves cause the red blood cells to break down so that the blood can no longer carry oxygen; the kidneys, liver and other organs may also be damaged. As little as a pound or two of leaves can be fatal.

Signs: Depending on how many leaves were eaten, signs can appear within a few hours or as long as four or five days after consumption. Signs include lethargy; refusal to eat; dark red-brown or black urine; pale yellowish gums and mucous membranes at first, advancing to dark muddy brown; increased respiratory rate; rapid heart rate; dehydration.

What to do: The only treatment is the administration of large amounts of intravenous fluids and possibly blood transfusions. Recovery depends on how many leaves were consumed and how promptly the horse receives care. *Special note:* Research indicates that the leaves of at least two related species--the silver and sugar maples--may contain the same toxic elements as red maples, but in less toxic amounts.



Bracken fern

Also known as: brake fern, eagle fern

ID: A perennial fern with triangular leaves that can reach two to three feet high. Grows in clumps in woodlands and moist open areas.

Range: Coast to coast, except for the Mediterranean and desert climates of Southern California and the Southwest.

The danger: Bracken fern contains thiaminase, which inhibits absorption of thiamin, which is vitamin B1. Thiamin is necessary to nerve function, and deficiencies can lead to neurological impairment. The relative toxicity of individual leaves is low--horses must consume hundreds of pounds to experience ill effects. However, bracken fern is unique among the toxic plants in that some horses seem to develop a taste for it and will seek it out even when other forages are available.

Signs: Signs are related to neural dysfunctions resulting from vitamin B1 deficiency and can include depression, incoordination and blindness.

What to do: Large doses of thiamin over the course of a week or two can aid in the recovery of horses whose bracken consumption is discovered before the neurological signs are severe.



TANSY RAGWORT (*Senecio* spp.)

Also known as: Tansy ragwort, groundsel

ID: A multistemmed weed with alternating leaves that produces clusters of small daisylike yellow flowers.

Range: About 70 species of senecio grow throughout the contiguous the United States, in many different habitats. Many are common in pastures and along roadsides.

The danger: Levels of toxicity vary among different members of the species, but all are thought to contain at least some concentration of pyrrolizidine alkaloids, which inhibit cell division, especially in the liver. Damage to the liver is cumulative and irreversible, and most horses succumb to chronic exposure over time, after consuming between 50 and 150 pounds, in total.

Signs: Often, there is no evidence of consumption until signs of liver failure begin to appear: photosensitization, diminished appetite and weight loss, progressing to depression, incoordination and jaundice.

What to do: There is no treatment for advanced stages of liver disease due to this toxin.



BLACK NIGHTSHADE, DEADLY NIGHTSHADE

Description: A hairless, spineless, erect, or trailing, branched annual plant with simple, ovate to lanceolate sinuate-toothed leaves. The flowers have 5 petals arranged in a 6-10 mm star. The flower clusters arise from a stalk that is situated between leaf nodes. The smooth, round, 5-10 mm fruits are initially green, turning black when ripe. The green fruits are toxic, but the ripe, black fruits are edible. Huckleberry is very similar in appearance, and is arguably a variety of *S. nigrum*.

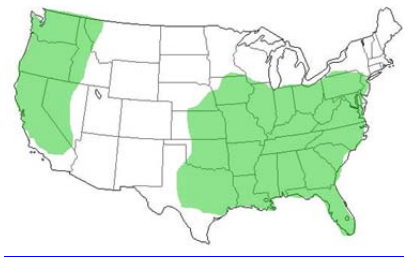
Habitat: Climbing nightshade, prefers disturbed soils, growing along roadsides, fences, and edges of cultivated fields.

Toxic Principle: Stems and leaves are poisonous. Nightshade contains alkaloids that interfere with digestion by inhibiting the autonomic and parasympathetic nervous systems and by directly irritating the digestive system. Nightshades may also accumulate toxic levels of nitrate.

Symptoms: Abdominal pain, diarrhea, muscle tremors and weakness, dilated pupils, death

Special Notes: Cooking destroys the toxic alkaloids in members of the nightshade family. Other members of the night shade family including potatoes and tomatoes, hairy nightshade (*Solanum sarrachoides*), cut leaf nightshade (*Solanum triflorum*), and silverleaf nightshade (*S. elaeagnifolium*) are toxic in the green state.

Treatment: Supportive therapy including intravenous fluids and electrolytes, intestinal protectants. Physostigmine may be tried cautiously to reverse some of the atropine-like effects.



Yew (*Taxus* spp.)

ID: A woody evergreen shrub with closely spaced, flat, needlelike leaves a half-inch to one inch long. Berries are bright red or yellow, soft and juicy with a hole in the end, where the dark seed is visible.

Range: Western yew and American yew are native to the West Coast and to the Eastern and central United States, respectively, but these two species along with the Japanese and English yews are commonly planted as ornamentals nationwide.

The danger: All parts of the yew plant, except for the fleshy portion of the berries, contain taxine, an alkaloid that causes respiratory and cardiac collapse. The leaves remain toxic even after dried. A single mouthful can be deadly to a horse within minutes.

Signs: Sudden death is the most typical sign of yew ingestion. Animals found alive may be trembling and colicky, with difficulty breathing and a slowed heart rate.

What to do: There is no treatment for yew poisoning. Avoidance is critical; most yew poisonings occur when trimmings are thrown into a pasture after a pruning.



Hemlock

Also known as: poison hemlock, spotted hemlock

ID: A relatively common range or pasture plant often found along roadsides, fence lines, creek beds and in pastures. This plant kills a number of cattle, sheep and horses each year and is also toxic to humans. This plant is not very palatable and is unlikely to be ingested when other forage is available. However, since poison hemlock is one of the first plants to grow in the spring, horses may eat this plant in the absence of other green feeds. Early in the spring, before the plant flowers, the leaves are especially poisonous.

Range: Grows wild along roadsides and other open uncultivated areas throughout North America.

The danger: Hemlock leaves, stems and seeds contain several potent neurotoxins that affect both the central and peripheral nervous systems. Four to five pounds is a lethal dose for a horse. Most animals will avoid the plant.

Signs: Signs appear within an hour or two of consumption, starting with nervousness, tremors and incoordination, progressing to depression and diminished heart and respiratory rates and possibly colic. Death results from respiratory failure.

What to do: There is no treatment, but if smaller doses were consumed, animals may recover with supportive care.



Oleander

Also known as: Rose laurel, adelfa, rosenlorbeer

ID: An evergreen shrub that can reach the size of a small tree, oleander has elongated, thick leathery leaves that can grow to three to 10 inches long. The flowers, which grow in large clusters at the end of branches, are one to three inches in diameter and can be white, pink or red.

Range: Hardy only in hot climates, oleander is used extensively in landscaping across the southern United States, from California to Florida. It is also grown as a potted plant in northern areas.

The danger: All parts of the plant contain the toxins oleandrin and neriin, which disrupt the beating of the heart. The leaves remain toxic when dried. About 30 to 40 leaves can be deadly to a horse.

Signs: Effects are usually seen several hours after ingestion and last over 24 hours. Signs include colic, difficulty breathing, tremors, recumbency and an irregular heart rate. The pulse may be either slowed or accelerated.

What to do: Horses can survive if treated early with supportive care, such as the administration of activated charcoal to inhibit further toxin absorption and the use of anti-arrhythmic drugs to stabilize the heart.



Author: Kurt Stueber



Locoweed

Also known as: Crazy weed

ID: Leafy perennials with short stems and compound leaves that grow in tuftlike forms from a single taproot. Some species may be covered with silvery hairs. The flowers, often white or purple, are borne on leafless stalks.

Range: Different species of locoweed--spotted or blue, woolly, purple, Lambert's, two-grooved milk vetch, white-point--grow in varied terrains throughout the West and Southwest, often in dry, sandy soil.

The danger: All fresh plants are toxic. All toxic species of locoweed contain swainsonine, an alkaloid that inhibits the production of the enzyme necessary for saccharide metabolism, and the resulting sugar buildup disrupts the function of brain cells. Some species are also selenium accumulators. Horses can tolerate very little selenium above the recommended intakes, and accumulator plants often have levels drastically beyond the safe level. For the species that are selenium accumulators, the plant will remain toxic after it is dried. Horses can become addicted to locoweed after tasting it a few times, so it must be completely removed from their access to prevent continual poisoning.

Signs: Strange behavior is usually the first evidence noticed; horses may bob their heads, adopt exaggerated, high-stepping gaits or stagger and fall. Other symptoms include excess salivation, chronic weight loss, and vision problems.

What to do: The cure for locoweed poisoning involves administering sedatives and laxatives while keeping the horse as quiet as possible. The earlier the horse is removed from the source of toxicity, the better. The earlier in the disease that the horse is removed, the better his prognosis will be. If access to the plant is removed before he starts showing advanced symptoms, he will usually have a slow but successful recovery from the toxicity.



Water hemlock

Also known as: Spotted water hemlock

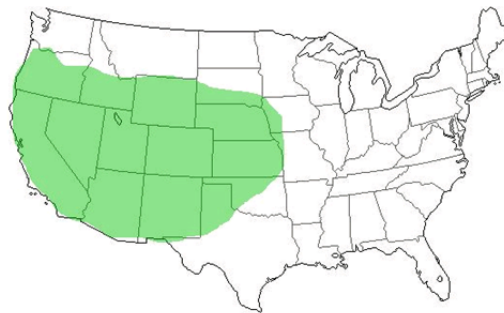
ID: A perennial weed with erect hairless stems that can grow to six feet from clusters of fleshy roots. The stems are hollow and branching, thicker at the base. Leaves are elongated and toothed, and the small white flowers form flat, umbrella-shaped clusters at the ends of branches.

Range: Water hemlock grows throughout the contiguous United States and is most likely to be found in marshy areas of meadows and along streams and irrigation ditches.

The danger: Water hemlock is considered one of the most toxic plants in the United States. All parts of the plant contain a cicutoxin alkaloid that affects the central nervous system, but the toxin is most concentrated in the root. Because cattle are more likely to pull up and consume the root, that species is considered most at risk of poisoning, but horses have also been known to browse the plant; less than a pound of the leaves and stems can be fatal. The toxin levels in the leaves and stems diminish as the plant ages during the growing season, and additional amounts of toxin are lost when the plant is dried, but water hemlock is never considered safe for consumption. Most animals will avoid the plant.

Signs: The toxins affect neurons primarily within the brain, causing various signs, including excessive salivation, dilated pupils and nervousness, progressing rapidly to difficult breathing, degeneration of the heart and skeletal muscles, seizures and convulsions; death usually results from respiratory paralysis. Signs of poisoning appear within an hour of ingestion, and death typically follows within two to three hours.

What to do: Supportive care initiated before the convulsions begin can offset the worst effects of the seizures, but horses who survive are likely to have experienced permanent damage to the heart and skeletal muscles.



Yellow star thistle/Russian knapweed

Also known as: Barnaby's thistle

ID: Yellow star thistle is an annual weed that branches out from a single base stem to form a spherical plant up to three feet tall; its round yellow flowers are surrounded by stiff spines 1/2 to 3/4 of an inch long. Russian knapweed spreads via a creeping root system; its erect, stiff stems grow two to three feet high and are covered with gray hairs, and its thistlelike flowers range from purple to white; Russian knapweed has no spines or prickles.

Range: Both plants appear throughout the Western United States, approximately from Missouri to California, and from Mexico northward, almost to Canada. They appear as weeds along roadsides, in cultivated fields and pastures.

The danger: Both plants contain a toxic agent that has a neurological effect on the brain that inhibits the nerves and control chewing. The poisoning is chronic in nature; to receive a toxic dose, horses must consume 50 to 200 percent of their body weight over 30 to 90 days.

Signs: Affected horses may appear to have tense or clenched facial muscles, and they are unable to bite or chew their food effectively. Weight loss is also common.

What to do: There is no treatment, and any neural damage is permanent. Euthanasia is recommended if the horse is too debilitated to eat.



JOHNSONGRASS

ID: Johnson grass is a coarse, drought tolerant, perennial grass, with long hairless, broad leaves, growing to 6 feet when in flower. It spreads by rhizomatous scaly roots, and by seed. Seeds are yellow-purple and are produced in large branched clusters. Sudan grass (*Sorghum bicolor*) and its hybrids are annuals.

Range: A common weedy grass of roadsides, waste areas and alluvial bottom land in the Eastern and Southern States.

The danger: Cyanogenic glycoside dhurrin which is hydrolysed by rumen microorganisms to free hydrogen cyanide (HCN). All parts of the plant are poisonous especially if wilted or in regrowth after the grass is cut. The Cyanide blocks the action of the cellular enzyme cytochrome oxidase thus preventing hemoglobin from releasing oxygen to the tissues. Death results rapidly from anoxia. Johnson grass may also accumulate toxic levels of nitrates especially under drought conditions or heavy fertilization. Horses are not affected by the acute effects of cyanide or nitrate in sorghums. When sorghums are grazed over a period of time they may cause neurological disease resulting in degeneration of the nerves of the hindquarters. Affected animals (horses, cattle, sheep) show hind leg weakness, ataxia, and urinary incontinence.

Signs: Initially animals show difficulty in breathing. Open mouth breathing is common as the animal becomes oxygen deprived. Mucous membranes appear cherry-red. Venous blood is cherry-red in color. Stressing the animal rapidly leads to collapse and death

Diagnosis: Commercial test kits for cyanide are available.

Special Notes: Hay made from some cyanide containing sorghum grasses are known to cause a chronic and irreversible disease in horses. Some varieties of sorghum contain lathyrogens -substances converted from cyanide or nitriles that cause demyelination/degeneration of the peripheral nerves of the hind legs and urinary bladder. Once affected, animals do not recover and are usually euthanized because of permanent damage to the nerves controlling the bladder and hind legs. Unless it is certain that the sorghum hay is from species of sorghum that have been selected to be free of cyanide, it is risky to feed the sorghum hay to horses for extended periods. Johnson and Sudan grass can also be a cause of nitrate poisoning.

Treatment: Without stressing the animal, sodium thiosulfate and sodium nitrite solution should be given intravenously. A mixture of 1ml 20% sodium nitrite and 3ml of 20% thiosulfate should be prepared and given at the rate of 4 ml of the mixture per 100lbs body weight.