

Equine Toxicity Series: Poisonous Plants to Horses

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The United States is home to numerous plants that are poisonous to horses. Some are rare, but most are common weeds and trees. The toxicity of the plant generally depends on soil, climate and life stage of the plant as well as the horse's age, weight and tolerance. Normally, a horse must ingest a large amount of the plant before toxicity occurs, while others require only a slight nibble or repeated grazing to be deadly. Most poisonous plants have low palatability, and horses tend to avoid them. However, when they are hungry, horses will eat anything they can access. The most common cause of ingestion is hunger when a horse is on an overgrazed pasture or its nutrition is not balanced. In addition to pasture plants, toxins can also be found in hay, contaminated grain, ornamentals and clippings.

Red Maple (*Acer rubrum*)

The red maple tree is a medium-sized tree that can be identified from its bright red-stemmed leaves containing shallow notches. Red maple leaves turn a distinct red in the fall. Red maple toxicosis occurs in horses when wilted or dry leaves are consumed. Fresh leaves and red autumn leaves are less toxic, but care should still be taken to avoid any consumption. Toxicity occurs in a 1,000-pound horse when approximately 1.5 pounds of leaves are consumed. Three pounds of leaves can be a lethal amount. Dried and wilted red maple leaves damage hemoglobin in red blood cells, inhibiting their ability to transport oxygen. Clinical signs usually occur one to two days after ingestion and include general symptoms such as weakness, depression, lack of appetite, and increased respiratory and heart rates. Yellow/brown mucous membranes and dark red urine are also classic signs of red maple toxicity.



Figure 1. Red Maple Tree (*Acer rubrum*)

Prevention

To prevent red maple toxicity, minimize access to red maple trees. It is important to check pastures after storms or high winds and remove any leaves that have fallen prematurely. Also, provide adequate forage so that horses are not tempted to eat the leaves. Death occurs in 75 percent of cases, so it is critical that appropriate measures be taken to minimize exposure to red maple leaves.

Pyrolyzadine Alkaloids (PA) Toxicity

Numerous species of plants in the United States cause Pyrolyzadine Alkaloid (PA) toxicity. Two common genera are *Crotalaria* and *Senecio*. *Crotalaria* are hardy annuals with yellow flowers. *Senecio* are multistemmed annuals or perennials with small, daisy-like yellow flowers. They include ragworts and groundsels. Every part of the plant of these two genera is toxic to horses whether fresh or dry. Consumption of these plants causes liver damage. Cell growth is slowed and cells are unable to divide. The damage is cumulative and irreversible. This poison is extremely dangerous because clinical signs can take weeks or months after ingestion to appear. Weight loss, anorexia and weakness commonly occur with PA toxicity as well as incoordination, jaundice and photosensitization. In some cases, coma can occur and lead to death. Death can also be sudden if a large amount of toxin is ingested.



Figure 2: Showy *Crotalaria*. Photo courtesy of University of Florida Extension.

Prevention

PA toxicity can be diagnosed if there is a history of consumption and availability to the horse. Increased liver enzymes indicate PA toxicity, and a liver biopsy can confirm the diagnosis. Horses showing signs of PA toxicity rarely recover. A low-protein diet that has less nitrogen is recommended as it lessens the liver workload. It is important to always provide adequate forage to discourage horses from grazing on weeds. Also, keeping pastures mowed appropriately will decrease weeds, resulting in decreased exposure.



Figure 3: *Senecio* species. Photo courtesy of Wikipedia.

Oleander (*Nerium oleander*)

Oleander is an evergreen shrub with red, white or pink clusters of flowers. All parts of the oleander plant are toxic, including dried leaves. Oleander contains a cardiotoxic compound, oleandrin, that disrupts the normal heartbeat, leading to cardiac arrest and death. Approximately 30-40 leaves can be lethal to a horse, and death usually occurs within 24 hours after symptoms appear. Colic, diarrhea, labored breathing, weakness and muscle tremors, and an inability to stand are clinical signs of oleander poisoning. An irregular or weak pulse is another classic sign.



Figure 4: Oleander. Photo courtesy of Plant Master.

Prevention

A veterinarian should be contacted immediately after symptoms appear or ingestion is observed. If a lethal amount has not been consumed, horses can be treated with a guarded prognosis for recovery. To prevent oleander poisoning, pastures should be kept clean of oleander leaves, and all plants should be removed from the property.

Yew (*Taxus spp.*)

Yew is a woody, evergreen shrub with bright red or yellow berries. All parts of the yew shrub are toxic to horses, even when dried. Taxine, the toxic alkaloid in yew plants, mainly affects the heart and causes cardiac collapse and respiratory failure. A single mouthful of yew needles can be lethal within minutes of consumption. Death usually occurs within a few hours of ingestion. Clinical signs include muscle tremors, incoordination, difficulty breathing, decreased heart rate and diarrhea.



Figure 5: Yew. Photo courtesy of Wikipedia.

Prevention

There is no treatment for yew poisoning, but the amount consumed determines the treatment plan. A veterinarian should be contacted immediately when yew poisoning is suspected. The best prevention for yew poisoning is to avoid planting them anywhere on properties with horses. Additionally, avoid throwing clippings of yew plants on manure piles or other areas horses have access to, because, even dried, the plant is still toxic.

Poison Hemlock (*Conium maculatum*)

Poison hemlock is a biennial herb with toothed, fern-like leaves with small white flower clusters and stems with distinct purple spots near the base of the plant. Hemlock grows all over North America. Neurotoxins found in the leaves, stems and seeds are lethal to horses when 4-5 pounds are consumed. The plant is not highly palatable, and most animals avoid it. Loss of appetite, excessive salivation, bloating, fast but weak pulse and muscle tremors occur with hemlock poisoning. Additionally, horses will present with extreme abdominal discomfort and frequently urinate and defecate. If death occurs, it is due to respiratory paralysis that leads to cardiac arrest.



Figure 6: Poison hemlock. Photo courtesy of Minnesota Department of Agriculture.

Prevention

Poison hemlock is not treatable. To avoid poisoning, pastures should be kept mowed and weeded.

Rhododendron, Azalea and Mountain Laurel

Rhododendron and mountain laurel are plants within the family Ericaceae (heather family). Azaleas are a member of the *Rhododendron* genus. Normally, these plants are not found in pastures but are ornamentals planted in yards and gardens. Grayanotoxins are contained within all parts of these plants; however, the leaves contain the greatest amount of toxin. Approximately 2 pounds of the plant per 1,000 pounds of body weight can be toxic. The toxins inhibit normal cell function and cause gastrointestinal problems. Clinical signs include excessive salivating, diarrhea and colic. When a significant amount of one of these plants is consumed, heart rate and coordination can be affected and death can occur.



Figure 7: Rhododendron



Figure 8: Azalea



Figure 9: Mountain Laurel

Prevention

As soon as a horse presents with these symptoms or is observed ingesting one of these plants, a veterinarian should be contacted. There is no specific treatment for this toxicity, but supportive care should be given. Depending on the amount of plant ingested, some horses have a chance of recovery. Horses should not have access to areas with these plants. Clippings of these plants should not be dumped into pastures, and pastures should be checked often for leaves.

Johnsongrass (*Sorghum halepense*)

Johnsongrass is a warm-season perennial grass that is drought-tolerant. When drought conditions occur, Johnsongrass becomes stressed and prussic acid (cyanide) builds up in the leaves and stems. Nitrates can also accumulate to toxic levels. If adequate hay is not supplemented, horses can consume large amounts of Johnsongrass, leading to toxicity. Over time, horses can develop cystitis-ataxia syndrome. Cystitis is inflammation of the bladder. The lack of muscle coordination, ataxia, is a result of damage to the spinal cord. Clinical signs of Johnsongrass toxicity include lack of coordination in the hindquarters, paralysis of tail and hind end, frequent and dribbling urination, scalding of the hind legs from urine, and fetal development problems or abortion.



Figure 10: Johnsongrass (*Sorghum halepense*)

Prevention

As soon as symptoms appear, a veterinarian should be contacted. A veterinarian can prescribe antibiotics to fight the cystitis, but once ataxia develops, the damage is permanent and prognosis poor. To prevent Johnsongrass poisoning, exposure to it should be minimal or avoided. Johnsongrass can be controlled in pastures through mowing and herbicides.

Cherry Trees (*Prunus* spp.)

Cherry trees are a common fencerow species that poses a threat to grazing animals. Wilted leaves are highly toxic as prussic acid, a hydrogen cyanide toxin, is contained in them. Prussic acid prevents oxygen from being transported properly in blood cells. Ingestion of wilted cherry leaves can lead to death within minutes in horses. Clinical signs include difficulty breathing, weakness, muscle tremors and rapid heartbeat.



Figure 11: Black cherry tree. Photo courtesy of Iowa State University Extension.

Prevention

If a horse presents with these symptoms, or was seen consuming wilted cherry leaves, a veterinarian should be contacted immediately. Pastures should be checked regularly for cherry branches, and cherry trees should not be planted on properties with horses.

Pokeweed (*Phytolacca americana*)

Pokeweed is a common pasture weed that can grow up to 10 feet tall and has clusters of dark purple berries at maturity. Horses can be poisoned from the stem and leaves, but the roots are the most toxic part of the plant. Clinical signs of pokeweed toxicity include severe colic and diarrhea.



Figure 12: Pokeweed (*Phytolacca americana*)

Prevention

There is no direct treatment for pokeweed toxicity. A veterinarian should be contacted immediately, and the horse should be treated with supportive therapy. Pokeweed has low palatability, so horses tend to not consume it unless extremely hungry. To avoid pokeweed poisoning, make sure horses have access to grass and additional forage if needed. Pastures and fence lines should be kept mowed and checked often for pokeweed.

Nightshade

Nightshade plants have small, white, star-shaped flowers and green berries when unripe. Multiple factors determine how toxic nightshade is to horses; however, unripened berries are highly toxic. Nightshade poisoning causes neurological damage, and horses can die within minutes, a few days, or eventually recover. Clinical signs include drowsiness, depression, progressive weakening of muscles, rapid heartbeat and weak pulse, and lack of coordination. A classic sign of nightshade poisoning is paralysis of the hind end.

Prevention

A veterinarian should be contacted immediately upon discovering a horse presenting with nightshade poisoning symptoms. Sudden death can occur if a large enough amount of the plant is ingested. If nightshade is present in pastures, it should be removed immediately. Pastures should be kept mowed to reduce the chance of invasive species growing.



Figure 13: Horsenettle (a member of the Nightshade family)

Jimsonweed (*Datura stamonium*)

Jimsonweed commonly grows in overgrazed pastures. It can grow up to 5 feet and has distinct white or purple trumpet-like flowers. The entire plant contains tropane alkaloids, which are highly toxic to horses. Clinical signs include colic, diarrhea, a weak and rapid pulse, and incoordination.

Prevention

A veterinarian should be contacted immediately if a horse shows signs of jimsonweed toxicity. Jimsonweed has low palatability, so horses will avoid it unless there is not adequate forage. Pastures should not be overstocked to avoid overgrazing.



Figure 14: Jimsonweed (*Datura stamonium*)

What to Do?

As soon as toxicity is suspected, remove the horse from the source and call your veterinarian immediately. Attempt to determine how much was ingested as this will help the vet create a treatment plan. Some toxins have antidotes specific to the plant, while others are treated symptomatically. Supportive care should be given. Even with treatment, damage can be permanent and lead to death. Do not attempt to treat your horse for poison without consulting your veterinarian. Some general signs of poisoning include difficulty swallowing or breathing, colic, laminitis, incoordination and weakness, stocking up, photosensitivity, and sudden death. To help prevent accidental poisoning, ensure your horse has access to an adequate amount of forage to discourage grazing weeds. Make sure pastures are not overgrazed so that weeds do not invade and begin to look appetizing to the horse. Only buy hay and grain from reputable sources and

inspect them before feeding. It is important as a horse owner to have a general idea of poisonous plants. Resources to help identify toxic plants include your veterinarian, local Extension agent, local universities, as well as florists and botanists.

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