

# Plants Poisonous to Goats

By Paul G. Johnson

Per the USDA, livestock poisoning attributed to common poisonous plants is an underreported but very real danger to livestock nationwide. Although unknown to many grazing animal farmers, common plants such as the Japanese yew, the red maple, and the wild black cherry, in addition to hundreds of less common plants, can be fatal to livestock. The Cornell University Poisonous Plants Internet Web Page answers approximately 1,200 electronic requests for information each work day (700 to 800 on weekends and holidays). This world wide web service of the University's Animal Science Department provides pictures of more than 100 species of toxic plants and extensive technical and clinical information. It also serves as the principal source of images for the Canadian Poisonous Plants Information System.

Lists abound of what plants are poisonous to goats. I have made an attempt to consolidate several separate lists into one useful format. Results of ingestion of poisonous plants vary including no effect, birth defects, photosensitization (see article on page 18 of May 1997 issue), and death. We have observed goats nibbling the leaves of a poisonous plant in passing while grazing a pasture with no (apparent) effects. However, even small amounts of some plants, such as hemlock or rhododendron, can be fatal within minutes.

My goal is to inform, not unnecessarily frighten you. For example, our property contains numerous oak trees. While ingestion of a great quantity of spring oak buds are considered toxic, we have experienced no problems. Many plants listed are not toxic unless eaten in a large quantity at one time. We

count ourselves lucky that the goats like poison oak and, despite its name, it is not poisonous. As shown below, time of year plays a part in many plants. In the spring, our pastures abound with Buttercups, a poisonous plant, yet the goats (thankfully!) pass them by.

When in doubt about a particular plant, check with your county extension agent, State University, or local veterinarian.

Be thankful you have goats! Based on our research, they are hardier than almost any other critter, and have bad reactions to far fewer toxic plants than sheep, cattle, horses, dogs or cats. The ruminants themselves have a natural "immunity" against many poisons not available to the single-stomached animals. The microorganisms in their digestive system metabolize most of the naturally occurring toxins present in feeds. They change the toxins into substances which do not pose a threat to the animal's health. These internal microorganisms are thus considered the first line of defense against toxicity. However, some compounds are metabolized into toxic substances in the rumen or the compounds themselves inhibit the production of other essential compounds thereby causing distress in the animal.

Ruminants naturally acquire tolerance to increased concentrations of toxic materials in feeds. Increased tolerance to toxins is caused by a change in the microbial population in the rumen.

## Contributing Factors

There are factors besides the goats' access to a poisonous plant which can contribute to poisoning. These factors include starvation, acciden-

tal ingestion and browsing habits of animals. Starvation is the most frequent contributing factor. Most swampy or forested land contains many species of poisonous plants. However, the goat normally will only eat these when they have nothing else left to eat.

Some plants are accidentally eaten by the goat as they graze. An example is water hemlock. This plant grows in wet areas in the early spring, a time when the animals are eager to eat fresh, young grass. They accidentally ingest the water hemlock along with fresh shoots of grass. A plant may also be consumed accidentally when it is baled in hay fed to the animals.

Poisonous plants are consumed due to the nature of the browsing animal. Goats like variety in their diet. Even if they have plenty of food in their lush green pasture, an ornamental (poisonous) shrub they can just reach over the fence may be sought as a variation in their diet.

The affect a poisonous plant will have on an animal once ingested depends on several factors including the amount of the plant ingested, which part of the plant was eaten, condition of the poisonous plant and the age, size and condition of the goat. Therefore, some animals may eat a poisonous plant and show no symptoms, while another animal, or that same animal at a different time, may eat the plant and die.

## Cyanogenetic Plants

Plants may be "poisonous" to the animals for a variety of reasons. Some plants contain a harmful acid under certain conditions. This poison interferes with the oxygen-carrying ability of the blood and death is usually rapid with no outward symptoms noticeable. These plants include wild cherries, peaches,

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**Poisonouse Plants**

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plums and other stone-fruited plants, sudan grass, sorghums, milkweed, horse nettle, black nightshade, mountain laurel and sorghums. Wilting of green leaves following a frost or other damage changes substances in the leaves to acid and sugar. These sweet, wilted leaves can be attractive as food to your little browsers. When completely dry, the leaves apparently lose their poison.

**Deadly Alkaloid-containing Plants**

These plants, as their title states, contain a deadly amount of alkaloids. Most of these plans are unpalatable for most animals, but, when eaten, they are deadly. These plants include water hemlock, poison hemlock, mayapple, bloodroot, pokeweed, nightshade and hellebore.

**Photodynamic Plants**

These plants cause a reaction in photosensitive animals. For a problem to occur, the animal must have unpigmented (white) skin, they must eat a sufficient amount of the plant, and then they must be exposed to bright sun. White goats may become severely affected.

Common photodynamic plants in-

clude rape, alsike clover, buckwheat, lantana, St. John's wort and ornamental Hypericum.

**Plants Which Cause Mechanical Injury**

Some plants have spiny coverings, long beards or fine hairs which may cause mechanical injuries or cause the formation of hair balls in the stomach and intestines of the goat. These plants include sand bur, downy brome grass, squirrel-tail grass, poverty grass, mesquite, cocklebur and clover.

Comparatively few poisonous plants grow in areas usually used as pastures, so for the most part, harmful plants may become a problem when goats are grazed in non-pasture areas (woods, swamps) or when the little darlings escape and eat the ornamentals in your or your neighbor's yard.

For the most part, awareness of your risk and good management practices will prevent most poisoning accidents. Good management practices include maintaining your goats' general health, providing an adequate selection of nonpoisonous food for their enjoyment and keeping them confined in areas of your choice.

**Sources of Information**

If you have internet access, check-

ing these sites for identification of a particular plant is useful. The internet addresses are:

<http://www.agnic.org/agdb/cuppp.html>

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

The contact at the University for poisonous plants is as follows:

Daniel Brown  
Cornell University  
Department of Animal Science  
123 Morrison Hall  
Ithaca, NY 14853  
Telephone: 607-255-44706  
Fax: 607-255-9829  
E-mail: [dlb20@cornell.edu](mailto:dlb20@cornell.edu)

Other good references about poisonous plants are:

National Goat Handbook, USDA/ University of Maryland, National Dairy Goat Data Base  
<http://www.reeusda.gov/agsys/adds/livestok/goats/ngd.htm>

NetVet - Washington University, Division of Comparative Medicine  
<http://netvet.wustl.edu/smrum.htm>

The Merck Veterinary Manual, 7<sup>th</sup> edition

List of Poisonous Plants

<u>Name</u>	<u>Where found in North America</u>	<u>Season Most Toxic</u>	<u>Possible Effect on goats</u>
Beargrass / <i>Nolina texana</i>	SW and Mexico	Spring	photosensitization, anorexia, lesions
Oaks / <i>Quercus spp.</i>	All areas	Spring	diarrhea (dark), anorexia, rumen problems, edema, death (must represent over 1/2 of diet to be toxic)
Cocklebur / <i>Xanthium spp.</i> (seeds)	All areas	Spring	anorexia, vomiting, convulsions

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## List of Poisonous Plants (continued from previous page)

<b>Name</b>	<b>Where found in North America</b>	<b>Season Most Toxic</b>	<b>Possible Effect on goats</b>
Buckeye / <i>Aesculus spp.</i> (young shoots and seeds)	East & Calif.	Spring/ Summer	paralysis, twitching, inflammation of mucous membranes
Buttercup / <i>Ranunculus spp.</i> Crow foot	Various	Spring/ Summer	blisters, inflamed intestinal tract
Crow Poison / <i>Amianthium</i> Stagger Grass <i>muscaetoxicum</i> Fly Poison	East	Spring/ Summer	vomiting, salivation, respiration difficulties, can be fatal
Coffee Pod / <i>Cassia obtusifolia</i> Sickle Pod	Eastern US some in Midwest	Spring/ Summer	diarrhea, heart problems, liver problems
Coffee Senna / <i>C. occidentalis</i> Coffee Weed Wild Coffee	Eastern US some in Midwest	Spring/ Summer	diarrhea, heart problems, liver problems, heart failure
Larkspur / <i>delphinium spp.</i> (young plants and seeds most toxic)	West	Spring/ Summer (seeds in fall)	vomiting, constipation, bloat, heart/lung problems, falling down, can be fatal
Lantana / <i>Lantana spp.</i>	SE US, So. Calif.	Spring/ Summer	anorexia, jaundice, liver or kidney failure, photosensitization
Water Hemlock / <i>cicuta spp</i> (member of carrot family)	All areas	Spring/ Fall	convulsions, coma, death—all within minutes!
Pinque / <i>Hymenoxys richardsonii</i> Colorado Rubberweed	West high and arid	Spring/ Fall	vomiting, green nasal discharge, anorexia, abdominal pain
Dog Bane / <i>Apocynum spp.</i>	All areas	Summer/ Fall	dilated pupils, anorexia, can be fatal
Mesquite / <i>Prosopis glandulosa</i>	SW US, Mexico	Summer/ Fall	anemia, edema, rumen problems
Black Locust / <i>robiia pseudoracacia</i> Locust tree False Acacia	Eastern US	Summer/ Fall	anorexia, diarrhea, weakness
Nightshade / <i>Solanum spp.</i> Belladonna / <i>Atropa belladonna</i>	All areas	Summer/ Fall	upset stomachs (rumen), trembling, salivating, progressive paralysis, death
Rattlebox / <i>Daubentonia (Sesbania)</i> Purple Sesbane (seeds)	SE US <i>punicea</i>	Fall/ Winter	diarrhea, respiration problems, can be fatal
Cloak Fern / <i>Notholaena sinuata</i> Jimmy Fern <i>var cochisensis</i>	SW US, Mexico	Fall/ Winter	trembling, arched back, nervous, respiratory rate and pulse increased, can be fatal without rest
Bladder Pod / <i>Sesbania</i> Rattlebox ( <i>Glottidium vesicaria</i> ) Sesbane Coffee bean	All areas	Fall/ Winter	diarrhea, respiration difficulties, coma, death
Mescal Bean / <i>Sophora</i> Mountain laurel <i>secundiflora</i>	SW US, Mexico	Fall/ Winter	falling, trembling, stiff gait, laying down, mystical visions (all temporary)

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## List of Poisonous Plants (continued from previous page)

<u>Name</u>	<u>Where found in North America</u>	<u>Season Most Toxic</u>	<u>Possible Effect on goats</u>
Chinaberry / <i>Melia azedarach</i> (fruit most toxic part)	SE US	Fall/Winter Spring	vomiting, constipation, death within 24 hours
Guajillo / <i>Acacia berlandieri</i>	SW US, Mexico	All year esp. Spring	prostration, excitation, can be fatal from starvation
Lechequilla/ <i>Agave lechequilla</i>	SW US, Mexico usually during dry season	All Year esp. Spring	photosensitization, anorexia, listlessness, discharge from nose, coma, death
Corn Cockle / <i>Agrostemma githago</i>	All areas	All Year esp. Spring	diarrhea, vomiting, weakness, can be fatal
Milkweed / <i>Asclepias</i> spp.	SW US, Mexico dry areas	All year esp. Spring	convulsions, dilated pupils, staggering, bloating, can be fatal
Locoweed / <i>Asragalus</i> spp. <i>Oxytropis</i> spp.	West US, Canada, No. Mexico	All year esp. Spring	uncoordinated behavior, hair dry without luster, abortion
Milk Vetch / <i>Astragalus</i> spp. (pre-flower stage worst)	All areas (not all species)	All year esp. Spring	some paralysis, rough-looking coat, "goose-stepping," death
Poison Hemlock / <i>conium maculatum</i>	all areas	All year esp. Spring	dilated pupils, weak, slow irregular breathing, death
Crotalaria / <i>crotalaria</i> spp. rattlebox	East & Central	All year esp. Spring	bloody diarrhea, unthrifty-body & coat, edema, death can occur in days, weeks, or or even months after ingested
Jimson Weed / <i>Datura</i> (seeds worst, <i>stramonium</i> but rest is bad too)	All areas	All year esp. Spring	convulsions, dilated pupils, uncoordinated, coma
Drymary / <i>Drymaria</i> Inkweed <i>pachyphylla</i>	SW, Mexico	All year esp. Spring	diarrhea, coma, death
Evening Trumpet / <i>Gelsemium</i> Yellow Jessamine, <i>sempervirens</i> Carolina Jessamine	SE US	All year esp. Spring	convulsions, dilated pupils, coma, death within 48 hours
Broomweed / <i>Gutierrezia</i> Snakeweed, Turpentine weed	SW, Mexico	All year esp. Spring	anorexia, diarrhea, followed by constipation, listlessness
Smallhead / <i>Helenium</i> Sneezeweed	Southern US	All year esp. Spring	weakness, vomiting, restlessness, salivating
Goatweed / <i>Hypericum</i> St.John's Wort <i>performatum</i> Kalamath weed	All areas	All year esp. Spring	photosensitization, convulsions, blindness, diarrhea, can be fatal
Lambkill / <i>Kalmia</i> spp. Laurel, Ivybush	East , NW	All year esp. Spring	vomiting, bloat, coma, muscle spasm, can be fatal

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## List of Poisonous Plants (continued from page 22)

<u>Name</u>	<u>Where found in North America</u>	<u>Season Most Toxic</u>	<u>Possible Effect on goats</u>
Hedgeplant / <i>Ligustrum spp.</i> Privet, Ligustrum	All areas	All year esp. Winter & Spring	convulsions, diarrhea, hypothermia, can be fatal
Bluebonnet / <i>Lupinus spp.</i> Lupines (seed the worst)	All areas, most poisonous in West	All year esp. Winter & Spring	no appetite, convulsions, respiratory paralysis, death
Heavenly or / <i>Nandina</i> Chinese Bamboo, <i>domestica</i> Nandina	South (decorative)	All year esp. Winter & Spring	cyanide poisoning (if still alive after an hour, will probably get well!)
Oleanders / <i>Nerium</i> <i>oleander</i>	South	All year esp. Winter Spring	vomiting, diarrhea, weakness, death
Photina: / <i>photina-fraseri</i> , Fraser's; <i>p.glabra</i> , Chinese; <i>p.serrulata</i> Redleaf; Redtip	South	All year esp. Winter & Spring	cyanide poisoning, death within 1 hour
Bracken fern / <i>Pterium</i> <i>aquilinum</i>	All areas	All year	blindness, anorexia, hemorrhaging, may be fatal
Cherry Laurel / <i>Prunus</i> <i>carolinus</i>	South	All year	bloat, convulsions, staggering followed by death
Peaches, / <i>Prunus spp.</i> Chokecherries, Wild Cherries	All areas	All year	convulsions, uncoordination, death by asphyziation within 15 minutes
Castor Bean / <i>Ricinus</i> <i>communis</i>	South	All year	salivation, vomiting, bloody diarrhea, uncoordinated gait
Johnson Grass / <i>Sorghum</i> <i>halepense</i>	South, North from NY to Iowa	All year	breathing difficulty, bloat, staggering, convulsions, can be fatal
Sorghum, / <i>Sorghum</i> Sudan Grass, <i>vulgare</i> Kafir, Durra Broomcorn, Schrock	All areas	All year	breathing difficulty, bloat, staggering, convulsions, can be fatal
Yew / <i>taxus spp.</i>	All areas	All year	diarrhea, dilated pupils, vomiting, tremors, may have rapid death

In addition to the above list, there are many ornamental or house plants which are toxic to goats—including rhododendron, which is very toxic.

## **Rhododendrons - They're Pretty But... They're Poisonous to Goats**

Rhododendrons and other members of the heath (Ericaceae) family including laurels, azaleas, lily of the valley and Japanese pieris, are poisonous to goats. They contain andromedotoxin, a substance which acts primarily on the autonomic nervous system of the goat. Ingestion of these plants will induce vomiting and other symptoms including hypotension (low blood pressure). It doesn't take much to cause a problem—as little as 0.1% of the animal's body weight ingested as fresh leaves may cause clinical signs.

Within 6 hours of eating the plant, the goat may show signs of depression, weakness, anorexia, salivation, abdominal pain, vomiting and maybe bloat or diarrhea. If small amounts of the plants are consumed, the harmful substance will eventually be eliminated—through one end or the other. If a large enough quantity is ingested, death may occur.

If exposure is noticed before symptoms occur, a rumenotomy before onset of signs is recommended. This is a procedure where rumen contents are removed. If symptoms are present, they may last several days and your treatment would be only symptomatic. Treatment might include intravenous fluid therapy to counteract the hypotension, insertion of stomach tube to release bloat if necessary, oral treatment with magnesium hydroxide and activated charcoal and injections of calcium. To prevent aspiration pneumonia due to vomiting, an antibiotic may also be useful.

If much has been ingested or if you are unsure of the amount, you will want to work with your vet.

### **An Experiment with Rhododendrons**

An experiment was conducted with goats and rhododendrons. Eighteen goats were offered free choice rhododendron clippings. Of the test subjects, two of them suffered convulsions and died. All of the remaining goats lived to tell the tale, but suffered a weight loss. Seven of them showed a sudden drop in milk production.

Before you conduct your own inadvertent experiment with rhododendrons or azaleas, you may want to make sure that your goats do not have access and that well-meaning neighbors are also aware of the danger.

Most of us have our tales to tell about goats and rhododendrons. Often goats will discover forgotten rhododendrons in the middle of a brush patch or those well-meaning neighbors will toss their yard trimmings over the fence for your herd.