

AGRI-FACTS

Practical Information for Alberta's Agriculture Industry

Agdex 130/666-1

Poisonous Plants on Range and Pasture

About 200 species of plants have been implicated in livestock poisonings in Alberta. Plants are considered poisonous if they contain or produce toxic substances in sufficient amounts to harm livestock. Depending on the type of poison and the amount of plant material eaten, an animal's reaction may range from reduced performance to death. Plants are not easily classified as poisonous or non-poisonous. Some poisonous plants are good forage when eaten in small amounts because the poison is eliminated or diluted as rapidly as it is ingested. Most poisonous plants are dangerous only when consumed in large quantities and even then may be harmless at certain times of the year. However, a few species such as western water hemlock are extremely poisonous even in small amounts.

Prevention of livestock losses depends on a good knowledge of poisonous plants and the seasons in which they are the most dangerous. Most losses due to poisonous plants result from a headman's failure to observe good management practices or a poor knowledge of pasture land.

Many poisonous species of plants are native to range and pasture lands. These plants are neither grazed nor browsed under normal conditions because they are unpalatable or few in number. Under exceptional circumstances other plants such as choke cherry can cause poisoning losses during drought conditions. Unusual conditions that force livestock to eat toxic quantities of poisonous plants may cause large losses. This happens when biting insects force cattle to spend a long time in brush where larkspur is prevalent. Cattle may eat large amounts of larkspur just to maintain their daily intake requirements.

Poisonous plants

Tall larkspur

Among all of the poisonous plants, tall larkspur (*Delphinium glaucum* S. Wars.) causes the greatest number of cattle deaths in Alberta. Tall larkspur is a member of the buttercup family and it stands from 0.6 to 2 metres

(2 to 6 ft.) tall. The flowers are deep blue or purple and have the characteristic spurs of the delphinium flower group. Tall larkspur is found in the foothills of the Rocky mountains, growing in moist draws or coulees and on hillsides at higher elevations. Larkspur needs some shade and a well-drained, fertile soil. The common habitat of larkspur is aspen forests. Large amounts of larkspur may be found in recently cleared land that has been left unbroken. Therefore, as livestock move from one pasture to another, the risk of livestock poisoning will vary.

Until recently tall larkspur had been considered more poisonous when it is young than at any other stage of growth. However, new research indicates that the principle poisoning agent, methyllycaconitine, is found throughout the tissue of young larkspur, and concentrates in the reproductive parts of the plant as the plant matures. In mature plants, only the seeds are considered poisonous.

Animals that consume as little as 0.7 per cent of their body weight in larkspur during a one hour period will die from the effects of methyllycaconitine, a diterpenoid alkaloid that is a powerful neuromuscular blocking agent.

Constipation and bloating are common signs of larkspur poisoning. The appearance of these signs leads to the use of many home remedies tailored to relieve the gas in bloated animals. An affected animal should be kept quiet with its head uphill. Subcutaneous injections of physostigmin salicylate, pilocarpin hydrochloride or strychnine sulphate are beneficial if the animal is not unduly excited by the treatment.

Tall larkspur causes poisoning in June and July, depending on the elevation. At lower elevations the plant material is not considered poisonous after August 15.

Low larkspur

Low larkspur (*Delphinium bicolor* Nutt) grows to a height of 45 cm (18 in.) and blossoms in May and early June. It is found in grasslands around Cypress Hills and at higher elevations in southwestern Alberta. Methyllycaconitine is the poisonous principle in both low and tall larkspurs.

Low larkspur is considered dangerous in the spring because it reaches a grazable height before most, grasses do. The low larkspur that is found in pastures can kill livestock if the pasture is grazed too early. Low larkspur dies back in early July and is not considered a problem after that time.

Ranchers, who use habitat where low larkspur is found, believe the plant is responsible for the death of a few calves each year. Cattle will not avoid larkspur. Both low and tall larkspur are readily grazed by cattle. A large patch of larkspur will allow animals to consume a lethal dose. Four pounds of larkspur will kill a 600 pound animal and 14 pounds will kill a 2000 pound animal. Based on body weight, light yearlings and calves are the most susceptible to poisoning, whereas heavy bulls or heavy cows are the least susceptible.

Arrowgrass

Arrowgrass (*Typhochloa maritima* L.) is the second major livestock killer in Alberta. Arrowgrass is an erect, grass-like, perennial herb that grows from 15 to 75 cm (6 to 30 in.) tall. The new leaves are basal and rush like, flat on one side and rounded on the other. The greenish flowers are small and inconspicuously clustered along spike-like flower stalks. Arrowgrass may be distinguished from other grasses by its thick fleshy leaves.

Arrowgrass grows in salt marshes and alkaline sloughs throughout Western Canada. It is under water for all or part of the growing season. Arrowgrass is found in single clumps and large patches. It may also be found growing with sedges, rushes and slough grass.

Arrowgrass contains a complex sugar that can form hydrocyanic or prussic acid when the plant is moistened and ground up. Chewing or grazing on arrowgrass releases an enzyme in the plant, which then breaks down the complex sugar to release highly toxic prussic acid. Older parts of plants generally have less potential to form poison than the young leaves. As little as 2 kg of plant material, is fatal if eaten over a short time period. Heavy grazing may trigger the plant to accumulate the complex sugar. Large amounts of arrowgrass in slough hay may be poisonous, so solid patches of arrowgrass should be left uncut during haying operations.

Western water hemlock

Western water hemlock, (*Cicuta douglasii* [DC] Coult. & Rose), is the most poisonous plant in North America and is known by many names including poison parsnip, wild parsnip, poison hemlock, wild carrot, and spotted parsley.

The toxin produced by water hemlock is cicutoxin, and it has been shown to be toxic to all classes of stock and to human beings. One root can kill a cow. Cicutoxin is a

violent convulsant that acts directly on the central nervous system. The convulsions are extremely violent and may cause an animal to kick, bellow and groan. Symptoms appear within 15 minutes to one hour after ingesting a lethal dose. Most livestock losses occur in the spring when the toxin is found in all parts of the lush growing plant. By late summer the toxin is confined to the roots, but the plant is dangerous even until fall when very wet weather makes it possible for cattle to eat the roots because of the pulling action of their normal grazing activity. The new toxic growth of water hemlock appears before other palatable forage becomes available in the spring.

Western water hemlock is found in wet areas such as ground springs in marshy areas or at the edge of streams. Water hemlock belongs to the Umbelliferae or carrot family. All members of this family resemble each other closely. Water hemlock is difficult to identify unless you know exactly what to look for. Therefore, if any Umbelliferae heads are spotted in a wet area, the plants should be identified. When there are only a few hemlock plants, they may be pulled and burned. If there are a great number of plants, they can be fenced-off to exclude animals.

Other poisonous plants

Range and pasture management greatly affects the livestock losses caused by poisonous plants. The number of poisonous plant problems a rancher may encounter are affected by:

1. How heavy the stocking rates are placed on pastures, and
2. The date of initial grazing.

There are several plants besides water hemlock, arrowgrass, and larkspur that a rancher should recognize and keep an eye on for possible problems. They are:

Black nightshade (*Solanum nigrum* L.),
Choke cherries (*Prunus* spp.), Corydalis (*Corydalis* spp.),
Death camas (*Zygadenus gramineus* Rydb.),
Dogbane (*Agocynum* spp.),
Early yellow Iocoweed (*Oxytropis macounii* [Greene] Rydb.),
Horsetails or scouring rush (*Equisetum* spp.),
Lady's-thumb (*Polygonum* spp.),
Lupines (*Lupinus* spp.),
Milk-vetchs (*Astragalus* spp.),
Monkshood (*Aconitum columbianum* Nutt.),
Mushrooms,
Mustards (Cruciferae family)
Saskatoon (*Amelanchier alnifolia* Nutt.),
Showy milkweed (*Asclepias speciosa* Torr.).

Grazing hazards to avoid

1. Trailing livestock from place to place. While on the move, animals tend to grab and swallow any green plant along the trail. Trailing animals too far and too fast will cause animal stress that may be paid for in poisoning incidents.
2. The scarcity of palatable forage for long periods of time. Hungry animals may show little discrimination in their choice of forage.
3. The lack of salt or minerals will cause a depraved appetite for strange things.
4. Grazing too early in the spring, before forage species have produced much growth, which leads to overgrazing of the pasture.
5. Grazing new pasture before making a careful inspection of the field.

More information is available in the following publications, *Stock Poisoning Plants of Western Canada*, by Jan Looman, Walter Majak, and Sylvester Smoliak, C.D.A. Pub. 1982-7E, and *Poisonous Plants of the United States and Canada* by John M. Kingsbury.

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1991