



Poisonous Plants and Range Management Alternatives

Hundreds of plants contain properties that at one time or another can be harmful to farm animals. Many of these plants occur on western ranges. Direct economic losses to cattle producers from poisonous plants were estimated to be \$91.3 million in 1978. Poisonous plants cause indirect losses also, such as reduced animal performance, reducing the optimum level of resource use, and increasing costs of management. Often considered an animal health problem, beef producers will be better able to prevent and/or reduce losses if poisonous plants are thought of as a range management subject.

What they are—where they grow

A poisonous plant is one that contains a toxic substance that can cause detriment to health or even death of the animals that eat it. Noxious plants are usually classified as unwanted and undesirable, nonpoisonous plants. Some plants irritate parts of the body but are nonpoisonous. Whether an animal just gets sick or gets sick and dies depends on the characteristics of the toxin, the dose, and the time over which the dose was received. In some cases abortions or deformed offspring may result. Many poisonous plants are not palatable and will not be consumed when the area is properly stocked with other forage plants. The concentration of the toxic substance often declines as the plant matures and the plants tend to be early season growers which decreases their relative abundance as the growing season advances. However, there are exceptions.

Plants that contain toxic or poisonous principles are natural components of the vegetation on many rangelands. Their relative amount depends on the ecological status of the species and the past use of the range. They can be part of the climax plant community, as with the larkspurs, or they can be found only in low ecological condition situations, as with arrowgrass. Poisonous plants tend to be much more abundant on poor to fair condition ranges than on good to excellent condition ones.

Management to reduce or prevent problems

To prevent losses the producer must know: (1) the plant ecology on the ranges, (2) the identity of poisonous plants and where they occur, (3) how a species affects livestock, and (4) when the plants are most poisonous. Poisonous plant problems will be minimized if a producer stays aware of the fact that good range management means: (1) proper stocking rate, (2) grazing at times when plant productivity will be least affected, (3) distributing grazing pressure evenly, and (4) using the proper kind and class of livestock.

Graze to maintain or improve range condition. Even if poisonous plants are present, there should be more other forage available to allow stock to be selective enough to avoid the harmful plants. Treatment of affected animals is often too late. Be

Prepared by Thomas E. Bedell, Extension rangeland resources specialist, Oregon State University, Corvallis.

aware that seasonal and site differences can expose stock to abnormal populations of some plants. This is why knowledge of plant identity is so important.

Management considerations

- Do not graze beyond the grazing capacity. Overgrazed ranges can mean increased proportions of poisonous plants, because more preferred species have been removed or because preferred plants are so low in production that livestock must graze the less preferred ones.

- Do not graze too early in the season. Let the desired forage plants get a good start before turnout. Often, early growing poisonous plants such as low larkspur and death camas are the first to turn green.

- Do not turn hungry stock onto infested ranges. Normally stock are selective grazers, but when hungry, they tend to eat whatever is within reach.

- Move stock carefully through infested areas. Also, don't crowd too much. Crowded animals consume anything they can, just as hungry ones do. Stock should have full stomachs before being trailed.

- Take care about turning animals onto an unfamiliar area, especially one which may contain some poisonous plants. Such stock may be less selective in their grazing.

- Make certain stock have free access to salt, phosphorous, and other needed elements. Move salting locations to aid grazing distribution. Moving locations can serve to lure stock from poisonous plant areas. Be sure to move the cattle so they know the new locations.

- Adequate water is extremely important. Also, if water is near poisonous plant areas, consider fencing stock from it so they will not be attracted there during the high-susceptibility season.

- Do not make hay from areas with poisonous plants. Plants such as arrowgrass commonly grow in areas that could be hayed. Stock do not eat hay selectively so would get more of the poisonous plant than they might if the same area were grazed.

- Do not graze when poisonous plants are the most dangerous. Try to develop management strategies to avoid or minimize the possibility of grazing at the worst time.

- Use another kind or class of stock if that will help. Larkspur-infested ranges can be grazed safely by sheep.

- Be cognizant of special environmental conditions that will either restrict animal movement or forage availability. Examples are: (a) Drought.

Take special care during drought, as poisonous plants could make up a higher proportion of forage and would be more attractive than normal. (b) Unseasonal snow conditions. These may restrict the diet to undesirable, perhaps poisonous species. (c) Extremely wet conditions. These can bring out higher levels of toxicity in some plants or perhaps the tubers or roots will be pulled up when grazing. Tubers and roots often contain the highest concentration of toxin.

Control of poisonous plants

When livestock management changes are not possible to make or would not be of benefit, it may be possible to control the plant through chemical or mechanical means. Some species lend themselves to this very well, whereas, others do not. First, learn the ecology so as to predict the results of removing the plant on the total plant community. The plants you remove should be replaced with more desirable plants, since nature will not leave a vacuum. Only after it is determined that control is feasible should chemicals be used. Examples of successful control vary. Low larkspur, fortunately, can be controlled by 2,4-D ester at normal sagebrush spray rates and at the same time. Conversely, chemical control of tall larkspur is more difficult and must be repeated.

Examples of plants poisonous to cattle

- *Arrowgrass*. Grass-like. Perennial. 1 to 3 feet tall. Found in wet areas, often in rush-sedge hayed meadows. Often in saline-alkaline areas. Contains hydrocyanic acid. Lethal dose is 0.1 to 0.5 percent body weight, consumed in a period of an hour or so. Poisonous in both green state and in hay. Much worse when stressed by moisture shortage or frost. Management: Do not graze infested areas when arrowgrass has been drought or frost stressed. If in hay, feed with good hay to dilute the arrowgrass.

- *Low larkspurs*. Several species poisonous. Low-growing perennial forbs. Generally 6 to 24 inches tall. Depending upon species, found on grass or shrub-grass ranges in plains, dry meadows, and foothills. Contains alkaloids. Lethal dose is 0.5 to 3.0 percent body weight. One of the earliest growing plants on spring ranges. Young growth is most poisonous. Palatable. Matures early. Sheep not affected. Management: (1) Graze with sheep during early part of season. (2) Delay cattle use until larkspur has flowered. (3) Control with 2 pounds 2,4-D ester per acre in early growth stage.

- *Tall larkspurs*. Large, erect, perennial forbs. 3 to 7 feet tall. Grow in areas shaded by trees or tall shrubs in mountains. Often with aspen. Mostly occurs in patches. Contains alkaloids. Lethal dose

is 0.5 to 3.0 percent of body weight. Relatively late maturing. Poisonous at all times, although least at maturity except for seeds. Palatable. Management: (1) spot chemical control or hand grubbing often only feasible approach. (2) Graze with sheep. (3) Delay grazing with cattle. (4) Fence out worst areas.

- **Water hemlock.** Stout, erect, perennial forb with tuberous, thickened roots. Small white flowers on an umbrella-like cluster. Leaves divided into two or three leaflets with saw-toothed edges. Grows along streams, ditches, and in swampy areas. Roots must be in water or wet soil. Extremely poisonous to all animals including man. Walnut-sized piece of root stock will kill a cow. Early growth of leaves and stems and the roots are the most poisonous. Management: (1) grub out plants. Be sure to remove tubers. (2) Delay use until preferred forage available. (3) Chemicals effective but may have to be reapplied.

- **Poison hemlock.** Erect biennial (sometimes perennial) forb. 2 to 10 feet tall. Stems branched, hollow, and purple-spotted. Leaves finely divided. More so than water hemlock. Leaf veins terminate at tips of leaf teeth; those on water hemlock terminate between leaf teeth. Flowers are like water hemlock. When foliage is crushed, it has offensive odor and taste, parsnip or mouse-like. Found in damp areas not as wet as for water hemlock. Contains at least five alkaloids. Lethal dose is 0.1 to 0.5 percent body weight of green material. Not palatable, but if no other available forage, cattle will graze it since it grows early in spring. Management: Delay turnout until adequate amounts of preferred forage are available.

- **Milkvetches.** Milkvetch, poison vetch, locoweeds (*Astragalus* spp.). Low-growing perennial forb in the pea family. Flowers white to purple on leafy stems. Not all species poisonous. Found on dry plains and slopes, generally, but one species, timber milkvetch, grows in better sites, often in open, forested conditions. Three main kinds of situations: (1) Milkvetches, poison vetches that accumulate selenium, causing both acute or chronic poisoning. (2) Locoweeds, causing locoism or affect the animals' judgment. Generally chronic poisoning. (3) Timber milkvetch, containing nitro compounds that cause acute or chronic poisoning. Selenium-containing milkvetches or poison vetches are usually not palatable, but do convert selenium into compounds readily absorbed by associated, preferred, forage species from the soil. Thus, cattle can be poisoned by grazing plants within their normal dietary preferences. Locoweeds: cattle normally will not prefer them, but once grazed, they will become addicted. The ef-

fects are cumulative. Timber milkvetch is palatable, with as little as 2 pounds of green material fatal to a cow. Management: Chemicals may be effective but distribution is often too sparse to warrant their use. Provision of adequate preferred forage through good grazing management is best alternative.

- **Prince's plume.** Selenium-containing, coarse, many-branched, yellow-flowered, perennial forb. Found on relatively dry sites in soil high in selenium. Poisoning may be either acute or chronic. Quite unpalatable. Not widespread in occurrence.

- **Point locos or point vetches.** (*Oxytropis* spp.). Often confused with *Astragalus* locoweeds. Are low-growing perennial forbs, with white to purple flowers on leaflet stems. *Oxytropis* has keel (lower most) petals narrowed to beak-like points; whereas, *Astragalus* has rounded keel petals. Not all *Oxytropis* species are poisonous. Found mostly on open plains and grasslands. Causes same loco problem as *Astragalus* species.

- **Lupines.** Many species on western ranges: Most are not poisonous. Effects on cattle are teratogenic (congenital deformities), although direct poisoning from alkaloids does occur rarely. Three main teratogenic-causing species: silky (*Lupinus sericeus*), tailcup (*L. caudatus*), spur (*L. Laxiflorus*). Erect, perennial forb, 5 to 7 finger-like leaflets, flowers white, pink, yellow, or blue and white. Found in moist but well-drained sites. Widespread. Pregnant cows that eat as little as 1½ pounds per day when in the 40th to 70th day of gestation have produced "crooked calves." Alkaloid concentration is quite high at early growth stages, but declines markedly as the plant matures. Mature seeds contain high concentrations, however. Management: Avoid grazing infested areas when cows are in 40th to 70th day of gestation, when lupine is in pre-flower stages, and when seed is ripe.

- **Chokecherry.** Shrub or small tree up to 30 feet tall. Oval, pointed tip, dark green leaves. Yellow-white flowers in dense clusters. Found mostly on seasonally moist sites in valley bottoms and hill sides. Contains hydrocyanic acid. As little as 0.25 percent of body weight as fresh green leaves is lethal if consumed in a period of an hour or less. Drinking water intensifies the reaction. Toxicity declines as the plant matures. Not very palatable. Main problem in early spring before adequate preferred forage available. Best to avoid grazing chokecherry areas at this time.

Plants that may cause occasional problems

- *St. Johnswort, goatweed, klamath weed.* Yellow-flowered perennial forb, 1 to 3 feet tall. Leaves with small dots. Found mostly in disturbed areas. Causes photosynthetization, so affects light-skinned cattle. Unpalatable. Generally not fatal but causes seriously decreased performance. Easily controlled biologically with an adapted beetle.
- *Bracken fern.* Unpalatable. Problems more commonly occur if in hay. Widespread on more moist but well-drained sites. Cumulative effect. Cattle must consume an amount equal to their body weight over a 1- to 4-month period to be fatal.
- *Death camas.* Perennial, basal leafed herb with onionlike bulb and white to yellow flowers. Mainly a problem for sheep. Grows early in spring. Contains alkaloids. Relatively unpalatable.
- *Milkweeds.* Several species. Mostly affects sheep, but cattle are susceptible. Large forbs usually with milky juice. Occupies many habitats. Very unpalatable. Most poisonous when green, but retains toxicity even when dry.
- *Ponderosa pine.* Causes pine needle abortion. Cows may die as well as abort the fetus. Avoid exposing pregnant cows to fresh available pine needles.
- *Greasewood.* Contains oxalate. Not a problem unless no other forage available. Considered good forage as long as mixed in the diet. Oxalate content increases with plant age, but palatability declines, so spring period is most hazardous.

Almost every state has a good publication on poisonous plants. One of the best is "Poisonous Range Plants of Montana," Bulletin 348, June 1977, available for \$1.95 from Montana State University, Bozeman 59715.