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Poisonous plants on Colorado rangelands

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Quick Facts

- Ranchers in the 17 western states suffer an annual direct loss (i.e., death and reduced lamb and calf crops) of \$234 million from poisonous plants.
- Poisoning on rangeland occurs with irregularity because of changes in climatic conditions.
- Many poisonous plants increase in abundance when rangelands are overgrazed.
- The palatability and toxicity of poisonous plants vary seasonally on rangelands.
- Proper grazing of livestock on rangelands that contain poisonous plants requires that ranchers know what class of livestock is most susceptible, be able to recognize poisonous plants, and know in what season(s) or under what conditions poisonous plants are most dangerous.
- The best way to reduce livestock losses on rangelands from poisonous plants is to maintain a good cover of forage species.

Livestock losses to poisonous plants on Colorado rangelands are among the serious problems that face today's ranchers. Although the exact economic impact to Colorado is unclear, estimated annual losses caused by poisonous plants in the 17 western states is over \$234 million. These were only direct losses from livestock death and reduced calf and lamb crops. Additional financial losses associated with poisonous plants include reduced weight gains, reduction in value of livestock and land, increased management costs (e.g., labor, veterinary, fencing, etc.), control costs, and decreased forage production due to competition. Poisoning on rangeland occurs with irregularity

because of changes in climatic conditions. This contributes to the risk involved in ranching.

Poisonous plants are normal components of range ecosystems, and our interest in them probably predates recorded time. Two important factors, however, have made their presence more serious on most western rangeland. First, many poisonous plants, such as sneezeweed and lupine, are "increasers" and have spread in abundance as range condition declined due to overgrazing. Second, several poisonous species have been introduced into western rangelands. Halogeton first appeared in Utah in 1935. Since that time, it has spread throughout much of the cold desert (salt-desert and sagebrush communities) in the Great Basin and Colorado Plateau.

Factors Affecting Poisoning

Most poisonous plants only kill animals if eaten in relatively large amounts and consumed over a short time period. Since livestock usually eat a variety of plants, ranges that are in good or excellent condition and provide a variety of forage are generally safe.

Most poisonous plants are not equally toxic to all classes of livestock: Larkspur, for example, cause more cattle deaths than any other plant species on western rangelands. Sheep, however, are only occasionally poisoned by larkspur and can graze ranges that are unsafe for cattle.

The physiological stage of an animal also can affect its susceptibility to poisonous plants. Cattle that ingest certain species of lupine between the 40th and 70th days of gestation may give birth to calves with crooked legs (crooked calf disease) and other congenital deformities. Similarly, ewes that consume western false hellebore on about the 14th day of gestation may produce lambs that have congenital head deformities (monkey-faced lambs). In both cases, deformities do not occur outside these time periods.

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The risk to livestock that graze ranges with poisonous plants varies throughout the year. Low larkspur and death camas, for example, generally are most troublesome in early spring when livestock are first turned on the range. In contrast, poisoning from tall larkspur is most prevalent in mid-summer at about its flowering time. During this period (i.e., toxic window), both palatability and toxicity of tall larkspur are sufficiently high to cause severe losses in cattle.

During periods of drought, many of the more palatable range plants mature and dry up early. Thus, little good forage is produced during much of the grazing season. In contrast, several poisonous plants have the ability to remain green during these periods. As a result, these poisonous plants increase in relative palatability and receive considerable use.

The adverse effects caused by drought are greatly intensified on overgrazed ranges. On abused ranges, the more palatable nonpoisonous plants are already in a weakened condition, and even a slight drought can cause severe problems. These ranges also are susceptible to a sudden flourish of poisonous plants in the wetter years following the drought. Ranges should be properly grazed, leaving a carry-over of desirable forage that may be used in times of drought. In periods of extended drought, livestock numbers may need to be reduced or supplemental feeding initiated.

Temporary drought or extended dry periods also may cause some plants to wilt and become highly toxic. Arrowgrass and chokecherry are most troublesome under these conditions.

Preventing Livestock Poisoning

Prevention of livestock poisoning on rangelands is easier to accomplish than curing poisoned animals. Although sound animal and grazing management may not eliminate all losses to poisonous plants, it is generally the most economical approach. If the following practices are employed, the majority of livestock losses on rangelands can be prevented.

1. Livestock operators should use good grazing management. Ranges should be grazed during the correct season and stocked with the proper number of animals. After desirable forage plants have been utilized, animals should be removed from the range.
2. Hungry animals should never be released onto, kept on or driven through poisonous plant areas. Animals graze less selectively when they are hungry than when they are satisfied; hungry animals tend to eat whatever is within reach.
3. Livestock should not be placed on the range until desirable forage has made sufficient growth to support grazing. Several poisonous plants (e.g., low larkspur, death camas, etc.) are among the first range plants to "green-up" in spring. If the more preferred, nonpoisonous species are overutilized, stock seek out the remaining species, many of which are poisonous.
4. Open herding methods with slow movement should be used when grazing areas with poisonous plants. This will allow animals to select a variety of desirable forage plants.
5. Avoid driving or bedding animals in dangerous areas. If this is unavoidable, animals should be driven through these areas slowly and with full stomachs.
6. Provide ample salt, minerals and water. A shortage of salt may cause animals to consume poisonous plants or plants they would not otherwise graze. Phosphorous shortages may cause abnormal appetites, and animals on such diets may consume poisonous plants. Lack of water also will alter grazing preferences and patterns.
7. Avoid grazing ranges during their most dangerous times. Ranges should be examined for the kinds, quantities and distribution of poisonous plants before stock are turned in. Some areas should be avoided during their most dangerous season if they support poisonous plants. This may require fencing infested areas to control cattle distribution or by proper herding of sheep.
8. Graze with the type of livestock that is least susceptible to the poisonous plants on the range. (NOTE: Economics and personal preference also play an important role in selection of correct type of livestock.)
9. Avoid grazing ranges that contain poisonous plants after they have been sprayed or fertilized. Spraying or fertilizing may increase the palatability and toxicity of poisonous plants. Keep all animals off sprayed areas until the poisonous plants are dead and dried up and for an indefinite period following fertilization.
10. Avoid grazing during extreme environmental conditions. Late spring and early fall snowstorms cover much of the preferred forage and result in abnormal consumption of poisonous plants, especially when in fruit. Wind storms also can increase the availability of oak and ponderosa pine foliage, thus increasing their risk of poisoning. Drought frequently increases the risk of livestock poisoning on ranges as well.
11. Livestock that are new to an area should be watched carefully. These animals, especially if confined, tend to be less selective in grazing habits and consume more undesirable (including poisonous) plants than animals that are familiar with the range.
12. Most poisonous plants can be killed by selective herbicides. Herbicidal control may be feasible where poisonous plants occur in dense concentrations and pose persistent risks of poisoning.

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Summary

Poisonous plants cause significant economic losses to Colorado's range livestock industry. Because poisonous plants are spread widely throughout the range ecosystem, herbicidal control generally has not been effective, except for

spot or localized spraying. To solve poisonous plant problems on rangelands learn to 1) recognize poisonous plants, 2) know the season that plants are most dangerous and the kinds of animals affected, and 3) practice sound grazing management that allow desirable forage species to crowd out the poisonous ones.

Table 1: Important poisonous plants on Colorado rangelands.

Name	Habitat	Livestock Affected	Dangerous Season(s)
Arrowgrass (<i>Triglochin maritima</i>) (<i>T. palustris</i>)	Meadows and alkaline flats; common in meadow hay	All	All, especially in dry season or after fall frost.
Broom snakeweed (<i>Gutierrezia sarothrae</i>)	Rocky plains and dry hillsides	Sheep and cattle	Spring
Chokecherry (<i>Prunus virginiana</i>)	Along streams and roadsides in lower valleys	All	All, especially early spring
Death camas (<i>Zygadenus</i> spp.)	Meadows and lower elevations	Sheep, occasionally cattle and horses	Early spring
Gambel oak (<i>Quercus gambelii</i>)	Foothills and mountain slopes	Cattle	Spring
Greasewood (<i>Sarcobatus vermiculatus</i>)	Alkaline flats	Sheep, occasionally cattle	Spring
Halogeton (<i>Halogeton glomeratus</i>)	Roadsides, overgrazed areas, especially on alkaline soils	Sheep, occasionally cattle	Late fall and early winter
Horsebrush (<i>Tetradymia canescens</i>)	Dry hills, ridges, plains; most abundant in sagebrush ranges	Sheep	Spring
Low larkspur (<i>Delphinium</i> spp.)	Foothills, sagebrush ranges	Cattle, occasionally sheep and horses	Early spring
Tall larkspur (<i>Delphinium</i> spp.)	Aspen and spruce-fir forests	Cattle, occasionally sheep and horses	Summer
Locoweed (<i>Oxytropis</i> spp.) (<i>Astragalus</i> spp.)	Foothills, plains, semi-desert regions	All, especially horses	All, especially spring
Lupine (<i>Lupinus</i> spp.)	Sagebrush ranges, grassy slopes	Sheep, occasionally cattle and horses	Late summer
Milkvetch (<i>Astragalus</i> spp.)	Forests, meadows and deserts	All	Summer
Ponderosa pine (<i>Pinus ponderosa</i>)	Mostly in southern Colorado at 4,000-9,000 feet elevation	Cattle	Late fall to early spring
Sneezeweed (<i>Helenium hoopesii</i>)	Meadows in aspen zone	Sheep, occasionally cattle	Summer
Senecio/groundsel (<i>Senecio</i> spp.)	Dry, gravelly soils on plains and foothills	All, especially cattle	Summer



Conditions of Poisoning

Troublesome in hay; toxicity increases 5 to 10 times during drought

Causes abortion and occasionally death; most troublesome on overgrazed ranges

Especially dangerous when frozen or wilted; large quantities are required for poisoning

Losses can be high when animals lack other forage

Poisoning generally occurs when oak makes up more than 50% of diet

Large quantities must be consumed by hungry animals in a short time

Greatest losses when hungry animals are exposed to dense stands

Heaviest losses during stormy weather when sheep are trailed through dense stands

Most troublesome in early spring when other forage is scarce

Species is palatable and may require deferment from grazing until after flowering

Some species not poisonous; generally consumed when feed is scarce; animals may become addicted

Hungry animals exposed to dense stands in the early growth stage and in late summer when plants are in fruit; malformation of calves when consumed between the 40th and 70th day of gestation

When ranges are overgrazed and when animals graze milkvetch for extended periods

Abortions most frequent during last trimester of pregnancy; browsing of pine needles increases with stress (e.g., snow, cold, hunger, etc.)

Poisoning is "cumulative;" generally consumed in summer or fall when palatable forage is scarce; causes chronic vomiting

Young animals most susceptible; generally consumed when livestock are short of palatable forage
