

TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE

Boise, Idaho

SOIL CONSERVATION SERVICE

TN - RANGE NO. 1

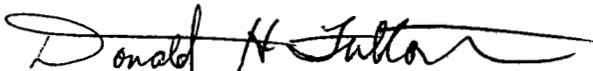
August 10, 1972

POISONOUS PLANTS

This Technical Note on Poisonous Plants will cancel TN-RANGE 1, dated June 13, 1957.

The attached material was developed by LaMar Mason, State Range Conservationist of Utah, in consultation with Dr. Binns and Dr. James of the ARS at Logan, Utah.

Please disregard the note at the bottom of each page of the attachment referring to conservation plants handbook.



Donald H. Fulton
State Range Conservationist

Attachment

POISONOUS PLANT GROUPS

GROUPED BY KIND
OF POISON

For Additional Information
See the Individual
Plant Description

FACTS ABOUT POISON PLANTS HELPFUL IN RANCH PLANNING

Prepared by Lamar Mason by Use of Reference Listed

This was reviewed, discussed and revised with Dr. Wayne Binns and Dr. Lynn James of the Agricultural Research Service, Poisonous Plant Research Laboratory. They contributed greatly to this document.

Losses are particularly heavy if:

1. Animals graze ranges where poisonous plants are present during the time when these species are most dangerous.
2. Animals are driven or trailed through infested areas or unloaded onto infested areas after being trucked or hauled.
3. Animals are not watered regularly. After thirsty animals get water, they readily eat poisonous plants that they otherwise would avoid.

It is always better to avoid or prevent poisoning instead of relying on treatment. Losses can be prevented through proper livestock and range management.

To protect animals from poisoning:

1. Learn to identify poisonous plants.
2. Inspect ranges for poisonous plants before putting animals out to graze and develop a grazing plan if possible.
3. Do not let hungry or thirsty animals graze areas heavily infested with poisonous plants.
4. Be sure desirable forage plants have made good growth before putting animals on range to graze.
5. If feasible, give supplemental feed and water to animals being trailed or transported to new ranges where poison plants exist.
6. Supply adequate salt and phosphorous well distributed over the range throughout the grazing season.
7. Eradicate poisonous plants where economically possible.
8. Do not let animals overgraze. Seed poison infested, poor condition range where possible and practical.
9. Remove animals from infested ranges when poisonous plants are most dangerous.
10. Provide adequate livestock water.
11. Livestock often seem to have an ability to learn to live with poison plants. Therefore, with new replacement animals, care should be taken when grazing where poisonous plants occur.

File in Conservation Plants Handbook - Poison Plants

1/72

2. PLANTS CONTAINING ALKALOIDS

A. List of plants

- | | |
|---------------------|-----------------------|
| 1). Water hemlock | Cicuta douglasii |
| 2). Poison Hemlock | Conium maculatum |
| 3). Ergot | Claviceps spp |
| 4). Lupines | Lupinus spp |
| 5). Death camas | Zygadenus |
| 6). Wild tobacco | Nicotiana Spp |
| 7). False hellebore | Veratrum californicum |
| 8). Nightshades | Solanum spp |
| 9). Larkspur | Delphinium spp |

These are examples of the most toxic only. Many other plants cause poisoning from alkaloids.

Poisonous Property

Complex compounds containing nitrogen that are alkaline in reaction and generally insoluble in water. They form salts with acids which are soluble and absorbable.

Conditions Under Which Plants May Cause Poisoning

All plant parts if eaten may cause poisoning. Changes in poisonous properties may also occur with growing season differences.

Livestock Symptoms

Violent or chronic reactions. Strong physiological reaction primarily through the nervous system. In some cases, liver damage may result. Staggering, falling, nausea, bloating and paralyzes.

Treatment and Loss Reduction

Prevention and sick care are the only remedial measures possible. Cannot be treated successfully with antidotes. Losses can be reduced by avoiding heavily infested ranges until plants have flowered or fence these areas from cattle use or change from cattle to sheep.

3. GLUCOSIDES

Sneezeweed (*Helenium hoopesii*) causes "Spewing" sickness. The poisonous substance is glucoside which has a cumulative effect. An animal may die by eating small quantities over a long period. Sheep can be poisoned by eating 2 pounds per day for 10 days. Recovery may occur if animals are taken off the infested area. Symptoms are depression, weakness, irregular pulse, frothing at the mouth, coughing, chronic vomiting or spewing and bloating. Remove affected animals and confine in a shaded pen, give them fresh water and green feed. Put them on a browse range for 10 to 14 days after recovery. Practice open herding and free movement. Sneezeweed can be controlled with 2, 4-D. Proper mineral supplementation may possibly help prevent losses.

4. GLYCOSIDES - CYANOGENETIC PLANTS

A. Species

- | | |
|---------------------------------|---------------------|
| 1). Chokecherry | Prunus virginiana |
| 2). Sudangrass and Johnsongrass | Sorghum spp |
| 3). Flax | Linum spp |
| 4). Birdsfoot trefoil | Lotus corniculatus |
| 5). White sweet clover | Melilotus alba |
| 6). Arrowgrass | Triglochin maritima |
| 7). Sweetclover | Melilotus spp |
| 8). Corn | Zea mays |

Poisonous Property

These plants may contain glycosides which release hydrocyanic acid (HCN) upon hydrolysis.

Conditions Under Which Plants May Cause Poisoning

When normal growth has been interrupted by drought, frost, trampling or other causes, hydrocyanic acid may develop to a point where the plants become toxic to livestock. Young plants and sprouts are more harmful than mature ones.

Livestock Symptoms

Nervous, abnormal breathing - rapid or slow and deep, trembling or jerking muscles, blue coloration of the lining of the mouth, spasms or convulsions until respiratory failure causes death. Blood is cherry red.

Treatment and How to Reduce Losses

Keep animals off areas where these plants have been retarded by drought, frost or other causes. Action is so fast that it is usually too late to treat an animal after poisoning signs are recognized. Some animals may be saved with an intraperitoneal injection, using 20cc of a 10 percent solution of sodium thiosulfate to which 10 cc of a 10 percent solution of sodium nitrate has been added.

5. PLANTS CONTAINING HYDRAQUINONE

Cocklebur (*Xanthium* spp) seeds and young plants contain hydroquinone. Hogs readily feed on the seedlings and are more susceptible to poisoning by cocklebur than any other class of livestock.

6. PLANTS CAUSING NITRATE POISONING

A. Species

1). Pigweed	Amaranthus spp
2). Musk thistle	Carduus spp
3). Lambsquarter	Chenopodium spp
4). Canada thistle	Cirsium arvense
5). Rocky mountain beeplant	Cleome serrulata
6). Poison hemlock	Conium maculatum
7). Morning glory	Convolvulus spp
8). Jimson weed	Datura stramonium
9). Barnyard grass	Echinochloa crusgalli
10). Milk purslane	Euphorbia maculata
11). White or bur ragweed	Franseria discolor
12). Wild sunflower	Helianthus annuus
13). Kochia	Kochia scoparia
14). Prickly lettuce	Lactuca serriola
15). Skeletonweed	Lygodesmia juncea
16). Cheeseweed	Malva neglecta
17). Sweetclover	Melilotus officinalis
18). Smartweeds	Polygonum spp
19). Dock	Rumex spp
20). Russian thistle	Salsola kali
21). Elderberry	Sambucus spp
22). Nightshades	Solanum spp
23). Goldenrod	Solidago spp
24). Sow thistle	Sonchus spp
25). Chickweed	Stellaria media
26). Mustard	Thelypodium lasiophyllum
27). Puncturevine	Tribulus terrestris
28). Stinging Nettle	Urtica procera
29). Barley	Hordeum vulgare
30). Alfalfa	Medicago sativa
31). Rye	Secale cereale
32). Sundangrass	Sorghum vulgare
33). Wheat	Triticum aestivum
34). Corn	Zea mays

Poisonous Property

Nitrate in plants over 1.5 percent (as KNO_3 , dry weight) may prove lethal to livestock. Sublethal nitrate poisoning has been attributed to ingestion of feed containing between 1.5 and 0.5 percent.

Conditions Under Which Plants May Cause Poisoning

Anytime a condition occurs which cause certain plant species to accumulate moderately large concentrations of nitrates. The capacity of soils to supply nitrates to these plants is a factor. Growth under drought conditions and lessened light tend to promote increased nitrate content. Spraying some plants with 2, 4-D may cause nitrate to accumulate to a toxic level.

Livestock Symptoms

Abortion is common. Depression of lactation, discolored urine, digestive disturbances and symptoms of vitamin A deficiency may occur. Trembling and weakness, lesions of the respiratory and digestion systems, and chocolate brown blood occur.

Treatment and Loss Reduction

Antibiotics which upset the rumen's capacity to convert nitrate to nitrite may temporarily and partially protect animals on high nitrate forage. Keep animals quiet and inactive. Use caution and avoid grazing areas where plants of high nitrate accumulation grow. Maintain animals on a nutritionally good diet. Avoid grazing plants such as corn and other nitrate accumulation plants under drought conditions. Avoid grazing unimproved, weedy, wet, low lying pastures where soils by nature are high in nitrogen. Avoid making silage from forage with abnormally high concentrations of nitrate.

7. OXALATE PRODUCING PLANTS (Organic Acids)

A. Species

- | | |
|----------------|-------------------------|
| 1). Halogeton | Halogeton glomeratus |
| 2). Greasewood | Sarcobatus vermiculatus |
| 3). Dock | Rumex spp |

Poisonous Property

Sodium oxalate and potassium oxalate.

Conditions Under Which Plants May Cause Poisoning

When amounts of these oxalates are consumed in excess of the capacity of the digestive tract to degrade them or change them into calcium salt, the oxalates are absorbed and are available to react with the calcium of the body fluids. Drift animals into areas of halogeton slowly to allow rumen microflora to become conditioned to the oxalate. Grazing shadscale for a time prior to being placed on halogeton will aid rumen microflora to be functioning when animals start grazing halogeton and will aid in preventing loss. In greasewood, the amount of oxalate increases as the plant matures.

About 12 ounces of halogeton will kill a sheep that has been without feed or 18 ounces if it has had other forage.

Livestock Symptoms

First signs occur 2 to 6 hours after animal eats a fatal amount. Death usually occurs in 9 to 11 hours, although some may linger on for several days. Early signs are dullness, colic, loss of appetite, lowering of head and reluctance to follow the band. Advanced signs are drooling with white or reddish froth, progressive weakening, animal unable to stand, rapid, shallow breathing, coma and death.

Treatment and How to Reduce Losses

No known treatment. Maintain good forage. Supplemental feeding helps prevent poisoning while trailing through infested areas or if unloaded in infested areas. Due to heavy seed production, every year plant is difficult to eradicate. Spraying with 2, 4-D will kill one year's crop. If repeated for 6 to 10 years, most seed production can be controlled. Control of halogeton can best be done by good range management.

8. PLANTS CAUSING SENSITIZATION OF LIVESTOCK TO SUNLIGHT
(Photosensitizing substances)

A. Species

- | | |
|---|-----------------------|
| 1). St. Johnswort or Klamath weed | Hypericum perforatum |
| 2). Littleleaf horsebrush or
Smooth horsebrush | Tetradymia glabrata |
| 3). Spineless horsebrush | Tetradymia canescens |
| 4). Spiny horsebrush | Tetradymia spinescens |
| 5). Spring parsley | Cymopterus watsoni |
| 6). Buckwheat | Fagopyrum esculentum |
| 7). Puncturevine | Tribulus terrestris |

Several clovers (alsike, red, white dutch, subterranean, and vetches) at times.

Poisonous Property

Also some of above plants contain unknown photodynamic substances and substances that damage the liver.

Conditions Under Which Plants Cause Poisoning

In sheep, the sensitization is most commonly observed after shearing on light colored skin exposed to sunlight.

In horses, alsike clover may cause a reddening of the skin by sunlight, followed by necrosis of the skin or a swelling and serious discharge.

Horsebrush causes swelling of sheep's heads, a condition commonly called "bighead". Plants are most toxic during active growth - March to May. Toxicity decreases rapidly after the plants have flowered and are dormant.

Livestock Symptoms

Sheep affected by littleleaf horsebrush may die sometimes so quickly that signs of poisoning do not develop. If a 100 pound sheep eats 1/2 pound of leaves and fine stems of littleleaf horsebrush or 1 1/4 pounds of gray horsebrush bighead results. Symptoms are depression, weakness, swelling of head, neck, ears, eyelids and nose; heavy drooping ears that hang straight down; loss of milk in nursing ewes, peeling of skin and wool from head, ears and back.

Treatment and How to Reduce Losses

Avoid horsebrush range while trailing sheep. Do not let animals graze infested areas immediately after watering. Move affected animals to shade as soon as you notice signs of bighead. Give them water and feed and leave them undisturbed for a few days. Pasture or range rotation or supplemental feeding during the danger season may prevent harmful affects.

9. SELENIUM PLANTS (Require Selenium for Growth).

A. List of selenium plants

1). Poisonvetches (astragalus) - 21 species and 3 varieties

a.	Alkali poisonvetch	Astragalus racemosus
b.	Beath poisonvetch (not in Utah)	Astragalus beathii
c.	Cibola poisonvetch (not in Utah)	Astragalus albulus
d.	Eastwood poisonvetch	Astragalus eastwoodae
e.	Grays' poisonvetch (not in Utah)	Astragalus grayi
f.	Hayden poisonvetch (not in Utah)	Astragalus bisulcatus var. haydenianus
g.	Moenkopi poisonvetch	Astragalus moencoppensis
h.	Osterhout poisonvetch (not in Utah)	Astragalus osterhouti
i.	Patterson locoweed	Astragalus pattersoni
j.	Preuss poisonvetch	Astragalus preussii
k.	Rattlebox poisonvetch (not in Utah)	Astragalus crotalariae
l.	Straightstem poisonvetch	Astragalus sabulosus
m.	Tineleaved poisonvetch	Astragalus pectinatus
n.	Toano poisonvetch	Astragalus toanus
o.	Twogrooved poisonvetch	Astragalus bisulcatus
p.		(not in Utah) Astragalus oocalycis
q.		(not in Utah) Astragalus praelongus

- 2). Woody aster Machaeranthera glabriuscula var villosa
- 3). Goldenweed Haplipappus spp
- 4). Prince's plump Stanleya spp
- 5). Aster Aster spp
- 6). Saltbushes Atriplex spp
- 7). Indian paintbrushes Castilleja spp
- 8). Penstemons Penstemon spp
- 9). Bastard toadflax Comandra pallida
- 10). Hopsages Grayia spp
- 11). Crops such as corn, wheat, barley, grass and hay.

Conditions Under Which Plants May Cause Poisoning

Plants may be poisonous if the selenium accumulating power of the plant and the soil's selenium supplying power result in selenium concentration high enough to cause poisoning and if the animals eat a sufficient amount. Five ppm selenium in a plant renders it potentially toxic.*

Livestock Symptoms

Animals will not consume plants with high selenium content unless there are few or no other plants to graze. Symptoms appear in a few hours to a day or two and are depression, coma and death through respiratory and myocardial failure. The pulse is rapid and weak. Lesions consist of acute passive congestion, severe enteritis and widespread hemorrhage. The liver and kidney present early acute degenerative changes. Dullness, emaciation and lameness may occur. Hoof may be deformed or cracked and may slough off. Long hairs of tail may drop off. Animals may kneel to graze and may die of starvation or thirst due to lameness. They may be anemic.

Treatment and Loss Reduction

Keep animals from grazing on soils containing selenium - where indicator plants occur. Under some circumstances addition of organic and inorganic arsenic compounds, sulfur compounds and protein supplements such as linseed meal to the diet have arrested or countered some or all the effects. Results have been erratic and nothing seems to be completely effective or specific.

- * Five parts per million of selenium renders a plant potentially toxic. Higher amounts of selenium in plants can be detected by the characteristic garlicky odor they impart.

10. PLANTS WITH TANNIN AS A POISONING AGENT

Oak (*Quercus gambellii*). More than 50 percent oak in the diet will cause sickness in cattle and 75 percent may cause death. Toxic substance is tannins. Symptoms are gaunt, tucked up appearance, constipation, frequently followed by profuse diarrhea, weakness, tendency to remain near water, reluctance to follow the herd, emaciation, mucus in droppings, dark-colored urine and collapse. Avoid loss by practicing proper grazing use and proper season of use. Keep off oak ranges until other forage is abundant. At first symptoms remove animals from range and give them adequate feed and water. A mild laxative such as mineral oil may be beneficial.

11. PLANTS PRODUCING TERATOGENESIS AND EMBRYONIC DEATH

A. List of Plant Producing Teratogenesis

1). Locoweeds and crazyweeds

- | | |
|------------------------------------|--|
| a. Blue locoweed (not in Utah) | Astragalus lentiginosus var. diphysus |
| b. Greenriver locoweed | Astragalus pubentissimus |
| c. Lambert crazyweed | Oxytropis lambertii |
| d. Patterson locoweed | Astragalus pattersoni |
| e. Sheep locoweed (not in Utah) | Astragalus nothoxys |
| f. Silky crazyweed | Oxytropis sericea |
| g. Silverleaved locoweed | Astragalus argophyllus |
| h. Specklepod locoweed | Astragalus lentiginosus |
| i. Thompson locoweed (not in Utah) | Astragalus mollissimus var. thompsonae |
| j. Thurber locoweed (not in Utah) | Astragalus thurberi |
| k. Woolly locoweed | Astragalus mollissimus |
| l. Wooton locoweed | Astragalus wootoni |

- 2). Silky lupine Lupinus sericeus
3). Tailcup lupine Lupinus candatus
4). Falsehellebore Veratrum californicum

5). There are no doubt other plants in addition to the above which have not yet been definitely identified with this group.

Poisonous Property

Properties vary greatly but they have not yet been identified.

Conditions Under Which Plants May Cause Poisoning

When cows and ewes feed upon the above species, abortion and congenial skeletal malformations frequently occur.

Above lupine species are dangerous from the time they start growth until they mature. They are most dangerous during the seed stage. Pods and seeds retain toxicity after the plants mature.

Hellebore, if eaten during early pregnancy, may cause deformities in the offspring of cattle, sheep and goats. Ewes on the 14th day of conception eating veratrum may produce lambs with one eye, shortened upper jaw and protruding lower jaw.

Livestock Symptoms

Locoweed must be grazed for a period of 2 or 3 weeks before signs of poisoning appear. These symptoms are loss of flesh, irregular gait, loss of sense of direction, nervousness, weakness, withdrawal from other animals, loss of muscular control, and violent actions may result to stressed animals.

Treatment and Loss Reduction

Keep animals off loco or lupine infested areas until the good forage species growth is abundant. These plants can be controlled by spraying the actively growing or budding plants with 2, 4-D at the rate of 2 to 3 pounds of acid equivalent per acre.

Do not let sheep graze false hellebore infested areas during the first quarter of gestation (first 50 days).

12. PLANTS WITH UNKNOWN POISONING AGENTS

Copperweed (*Oxytenia acerosa*). Poisonous properties unknown. Mostly cattle but occasionally sheep are affected. Poison toxicity reaches a peak as the plant matures. Poisoned cattle may die in 24 to 48 hours, sheep 1 to 3 weeks. Symptoms are loss of appetite, depression, weakness and coma. Provide adequate forage. Use supplemental feed when grazing or driving animals through infested areas.

Rubberweed (*hymenoxys richardsoni*) - is a dangerous poison weed. It is found mostly in the southern part of the state south of Salina. Often found on bedgrounds and other overgrazed areas. Poisonous throughout the summer mostly to sheep. This plant is quite unpalatable so only becomes dangerous when few if any forage plants are available for grazing. The poison appears to accumulate in the system and general emaciation, weakness and vomiting may occur by eating small quantities of the plant over long periods of time. Prevention of poisoning is good range management. Don't graze range in the spring until forage plants are growing and producing good volume.

Milkweed (*Asclepias labriformis* and *A. subverticillata*) usually occurs where range is overgrazed or in areas where the vegetation has been disturbed (corrals, trails, roadside, etc.). Not palatable so only dangerous where other feed is not available or animals are forced to eat it. Poisonous at all seasons. No cure is known. Animals breathe noisily from respiratory difficulties and die with violent spasms resulting from respiratory failure.

13. PLANTS PRODUCING A THIAMINE DEFICIENCY

A. Species

- 1). Bracken fern Pteridium aquilinum
- 2). Horsetail Equisetum spp

Poisonous Property

Not completely understood.

Conditions Under Which Plants May Cause Poisoning

Grazing these plants leads to a thiamine deficiency in horses. Cattle and pigs may be affected but not as susceptible as horses. Sheep are generally resistant. Consumption of horsetail by cattle and sheep causes rapid loss in condition and complete cessation of milk flow. Bracken fern eaten over a period of time may cause cancer.

Livestock Symptoms

In cattle and sheep, high fever, loss of appetite, depression, difficulty in breathing, excessive salivation, nasal and rectal bleeding, bloody urine and hemorrhages in mucous membranes. Small doses over period of time produces cancer of bladder.

Treatment and How to Reduce Losses

Provide adequate forage so livestock will not eat these species. Do not overgraze range. Provide supplements toward end of grazing season. Few cattle have recovered after signs of acute poisoning appear.

COMMON POISON PLANTS

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group and Cause</u>
Alfalfa	Medicago sativa	6. Nitrates
Alkali poisonvetch	Astragalus racemosus	9. Selenium
Alsike clover	Trifolium hybridum	8. Photosensitizing
Arrowgrass	Triglochin maritima	4. Glycosides
Aster	Aster spp	9. Selenium
Barley	Hordeum vulgare	6. Nitrates
Barnyard grass	Echinochloa crusgalli	6. Nitrates
Bastard toadflax	Comandra pallida	9. Selenium
Bee flower	Cleome serrulata	6. Nitrates
Birdsfoot trefoil	Lotus corniculatus	4. Glycosides
Blue locoweed	Astragalus lentiginosus (not in Utah)	1. Abortion 11. Teratogenesis
Bracken fern	Pteridium aquilinum	13. Thiamine deficiency
Bristle thistle	Carduus spp	6. Nitrates
Buckwheat	Fagopyrum esculentum	8. Photosensitizing
Burdock	Arctium minus	1. Abortion
Bur ragweed	Franseria discolor	1. Abortion 6. Nitrates
California false hellebore	Veratrum californicum	11. Teratogenesis
Canada thistle	Cirsium arvense	6. Nitrates
Cheeseweed	Malva neglecta	6. Nitrates
Chickweed	Stellaria media	6. Nitrates
Chokecherry	Prunus virginiana	4. Glycosides
Cocklebur	Xanthium spp	5. Hydroquinone
Copperweed	Oxytenia acerosa	12. Unknown
Corn	Zea mays	6. Nitrates 4. Glycosides
Curlycup gumweed	Grindelia squarrosa	9. Selenium
Death camas	Zygadenus spp	2. Alkaloids
Dock	Rumex spp	7. Oxalates 6. Nitrates
Eastwood Poisonvetch	Astragalus eastwoodae	9. Selenium
Elderberry	Sambucus spp	6. Nitrates 1. Abortion
Ergot	Claviceps spp	2. Alkaloids
Falsehellebore	Veratrum californicum	1. Abortion 2. Alkaloids and 11. Teratogenesis
Flax	Linum spp	4. Glycosides
Goldenrod	Solidago spp	6. Nitrates
Goldenweed	Haplopappus spp	9. Selenium
Greaseweed	Sarcobatus vermiculatus	7. Oxalates
Greenriver locoweed	Astragalus pubentissimus	11. Teratogenesis and 1. Abortion
Halfmoon loco	Astragalus allochrous	11. Teratogenesis and 9. Selenium
Halogeton	Halogeton glomeratus	7. Oxalates
Hopsages	Grayia spp	9. Selenium
Horsetail	Equisetum spp	13. Thiamin deficiency
Indian paintbrushes	Castilleja spp	9. Selenium
Jimson weed	Datura stramonium	6. Nitrates
Johnsongrass	Sorghum halepense	4. Glycosides
Klamath weed	Hypericum perforatum	8. Photosensitizing
Kochia	Kochia scoparia	6. Nitrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group and Cause</u>
Labriform milkweed	<i>Asclepias labriformis</i>	12. Unknown
Lambert crazyweed	<i>Oxytropis lambertii</i>	11. Teratogenesis and 9. Selenium
Lambsquarter	<i>Chenopodium album</i>	1. Abortion 6. Nitrates
Larkspur	<i>Delphinium spp</i>	2. Alkaloids
Littleleaf horsebrush	<i>Tetradymia glabrata</i>	8. Photosensitizing
Lupines	<i>Lupinus spp</i>	2. Alkaloids
Milk purslane	<i>Euphorbia maculata</i>	6. Nitrates
Milkweed	<i>Asclepias labriformis</i> and <i>A. subverticillata</i>	12. Unknown
Moenkopi poisonvetch	<i>Astragalus moencoppensis</i>	9. Selenium
Morning glory	<i>Convolvulus spp</i>	6. Nitrates
Muskthistle	<i>Carduus spp</i>	6. Nitrates
Mustard	<i>Thelypodium lasiophyllum</i>	6. Nitrates
Narrowleaf poisonvetch	<i>Astragalus pectinatus</i>	9. Selenium
Nightshades	<i>Solanum spp</i>	6. Nitrates 2. Alkaloids
Oakbrush	<i>Quercus gambelii</i>	10. Tannin
Oats (hay)	<i>Avena fatua</i>	1. Abortion
Patterson locoweed	<i>Astragalus pattersoni</i>	11. Teratogenesis and 1. Abortion 9. Selenium
Penstemons	<i>Penstemon spp</i>	9. Selenium
Pigweed	<i>Amaranthus spp</i>	6. Nitrates
Pine needles	<i>Pinus spp</i>	1. Abortion
Poison hemlock	<i>Conium maculatum</i>	6. Nitrates 1. Abortions and 2. Alkaloids
Preuss Poisonvetch	<i>Astragalus preussii</i>	9. Selenium
Prickly lettuce	<i>Lactuca serriola</i>	6. Nitrates
Princesplume	<i>Stanleya spp</i>	9. Selenium
Puncturevine	<i>Tribulus terrestris</i>	6. Nitrates and 8. Photosensitizing
Red clover	<i>Trifolium pratense</i>	8. Photosensitizing
Redroot	<i>Amaranthus spp</i>	6. Nitrates
Rocky mountain beeplant	<i>Cleome serrulata</i>	6. Nitrates
Rubberweed	<i>Hymenoxys richardsoni</i>	12. Unknown
Russian thistle	<i>Salsola Kali</i>	6. Nitrates
Rye	<i>Secale cereale</i>	6. Nitrates
Saltbushes	<i>Atriplex spp</i>	9. Selenium
Sheep locoweed (not in Utah)	<i>Astragalus nothoxys</i>	1. Abortion and 11. Teratogenesis
Silky crazyweed	<i>Oxytropis sericea</i>	11. Teratogenesis/Abortion
Silky lupine	<i>Lupinus sericeus</i>	11. Teratogenesis
Silverleaved locoweed	<i>Astragalus argophyllus</i>	1. Abortion and 11. Teratogenesis
Skeletonweed	<i>Lygodesmia juncea</i>	6. Nitrates
Smartweeds	<i>Polygonum spp</i>	1. Abortion 6. Nitrates
Smooth horsebrush	<i>Tetradymia glabrata</i>	8. Photosensitizing
Snakeweed	<i>Gutierrezia sarothrae</i>	1. Abortion
Sneezeweed	<i>Helenium hoopesii</i>	3. Glucoside
Sowthistle	<i>Sonchus spp</i>	6. Nitrates
Specklepod locoweed	<i>Astragalus lentiginosus</i>	11. Teratogenesis and 1. Abortion
Spineless horsebrush	<i>Tetradymia canescens</i>	8. Photosensitizing
Spiny horsebrush	<i>Tetradymia spinescens</i>	8. Photosensitizing
Spring parsley	<i>Cymopterus watsoni</i>	8. Photosensitizing

File in Conservation Plants - Poison Plants

1/72

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group and Cause</u>
Stinging nettle	<i>Urtica dioica</i> var <i>procera</i>	6. Nitrates
St. Johnswort	<i>Hypericum perforatum</i>	8. Photosensitizing
Straightstem poisonvetch	<i>Astragalus sabulosus</i>	9. Selenium
Subterranean clover	<i>Trifolium subterraneum</i>	8. Photosensitizing
Sudangrass	<i>Sorghum sudanense</i>	4. Glycosides 6. Nitrates
Sugar beet (tops)	<i>Beta Vulgaris</i>	1. Abortion
Sunflower	<i>Helianthus annuus</i>	6. Nitrates
Sweet clover	<i>Melilotus</i> spp	4. Glycosides 6. Nitrates
Tailcup lupine	<i>Lupinus caudatus</i>	11. Teratogenesis
Thelypod mustard	<i>Thelypodium lasiophyllum</i>	6. Nitrates
Thompson locoweed (not in U)	<i>Astragalus mollissimus</i> var <i>thompsonae</i>	1. Abortion and 11. Teratogenesis
Threadleaf snakeweed	<i>Gutierrezia microcephala</i>	1. Abortion
Thurber locoweed (not in U)	<i>Astragalus thurberi</i>	1. Abortion and 11. Teratogenesis
Tineleaved poisonvetch	<i>Astragalus pectinatus</i>	9. Selenium
Twogrooved poisonvetch	<i>Astragalus bisulcatus</i>	9. Selenium
Vetches	<i>Vicia</i> spp	8. Photosensitizing
Water hemlock	<i>Cicuta douglasii</i>	2. Alkaloids
Toano poisonvetch	<i>Astragalus toanus</i>	9. Selenium
Weedy milkvetch	<i>Astragalus miser</i>	11. Teratogenesis
Western bracken	<i>Pteridium aquilinum</i>	13. Thiamin deficiency
Wheat	<i>Triticum</i> spp	6. Nitrates
White Dutch clover	<i>Trifolium repens</i>	8. Photosensitizing
White sweet clover	<i>Melilotus alba</i>	4. Glycosides
White ragweed	<i>Franseria discolor</i>	6. Nitrates
Whorled milkweed	<i>Asclepias subverticillata</i>	12. Unknown
Wild Sunflower	<i>Helianthus annuus</i>	6. Nitrates
Wild tobacco	<i>Nicotiana</i> spp	2. Alkaloids
Woody aster	<i>Machaeranthera glaberiusenla</i> var <i>villosa</i>	9. Selenium
Wooly locoweed	<i>Astragalus mollissimus</i>	11. Teratogenesis and 1. Abortion
Wooton locoweed	<i>Astragalus wootoni</i>	11. Teratogenesis and 1. Abortion
Yellow blossom sweetclover	<i>Melilotus officinalis</i> <i>Astragalus pattersoni</i> <i>Astragalus pectinatus</i>	6. Nitrates 9. Selenium 9. Selenium

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