

# Poisonous Native Plants and Noxious Weeds

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# Castor Bean – *Ricinus communis*





# **Factors predisposing plant poisoning**

**Lack of adequate forage**

**Time of year**

**Drought**

**Adaptation to new plants**

**Snow cover**



**How great a risk is there in this pasture?**









**“It is the dose that makes the poison”  
(Paracelsus 1555)**





# Variation in susceptibility to plant poisoning





**‘The dose makes the poison’**





# Invasive and Noxious Weeds of Montana

*Acroptilon repens*

*Cardaria draba*

*Centaurea diffusa*

*Centaurea solstitialis*

*Centaurea maculosa*

*Chondrilla juncea*

*Cirsium arvense*

*Convolvulus arvensis*

*Crupina vulgaris*

*Cynoglossum officinale*

*Euphorbia esula*

*Hieracium aurantiacum*

*Hieracium spp.*

*Iris pseudacurus*

*Isatis tinctorum*

*Lepidium latifolium*

*Chrysanthemum leucanthemum*

*Linaria dalmatica*

*Linaria vulgaris*

*Lythrum spp.*

*Myrophyllum spicatum*

*Potentilla recta*

*Ranunculus acris*

*Senecio jacobea*

*Tamarix sp.*

*Tanacetum vulgare*



# Poisonous Native Plants

To name but a few...

- Locoweeds
- Larkspur
- Veratrum
- Death camas
- Sage
- Ponderosa
- Snakeweed
- Water hemlock











**What is the  
most  
poisonous  
Native Plant in  
Montana?**

**Water Hemlock  
*Cicuta maculata***







# Water Hemlock *Cicuta spp.*





# Water Hemlock (*Cicuta maculata*)



4 species Indigenous  
to North America

Marshy habitat

Root is the most toxic

Poisonous to all animals





# Water Hemlock Roots (*Cicuta maculata*)

**Cicutoxin**



**2gm/kg b.w lethal**

**Blocks ion channels  
Inhibits GABA  
Violent Convulsant**



# Poison Hemlock

## *Conium maculatum*





# Poison Hemlock

## *Conium maculatum*



Biennial noxious weed  
Coniine alkaloid  
Neurotoxic  
Teratogenic

Lethal dose  $>0.5\%$  of b.w.





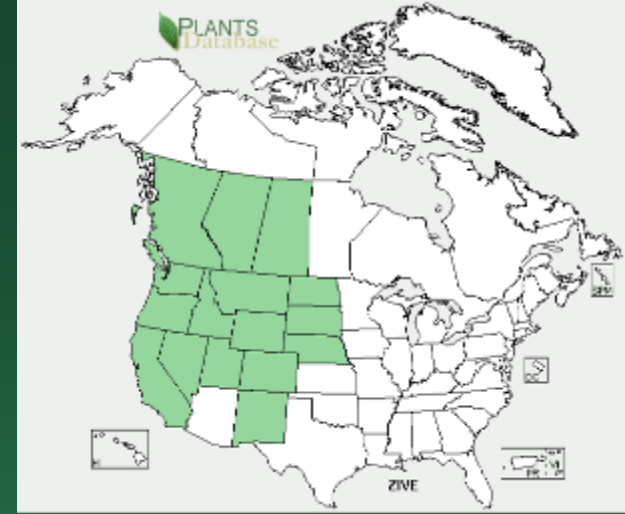
**Death Camas**  
**Genus: *Zigadenus***  
**(*Toxicoscordion*)**  
**14 species**  
**Native to North America**





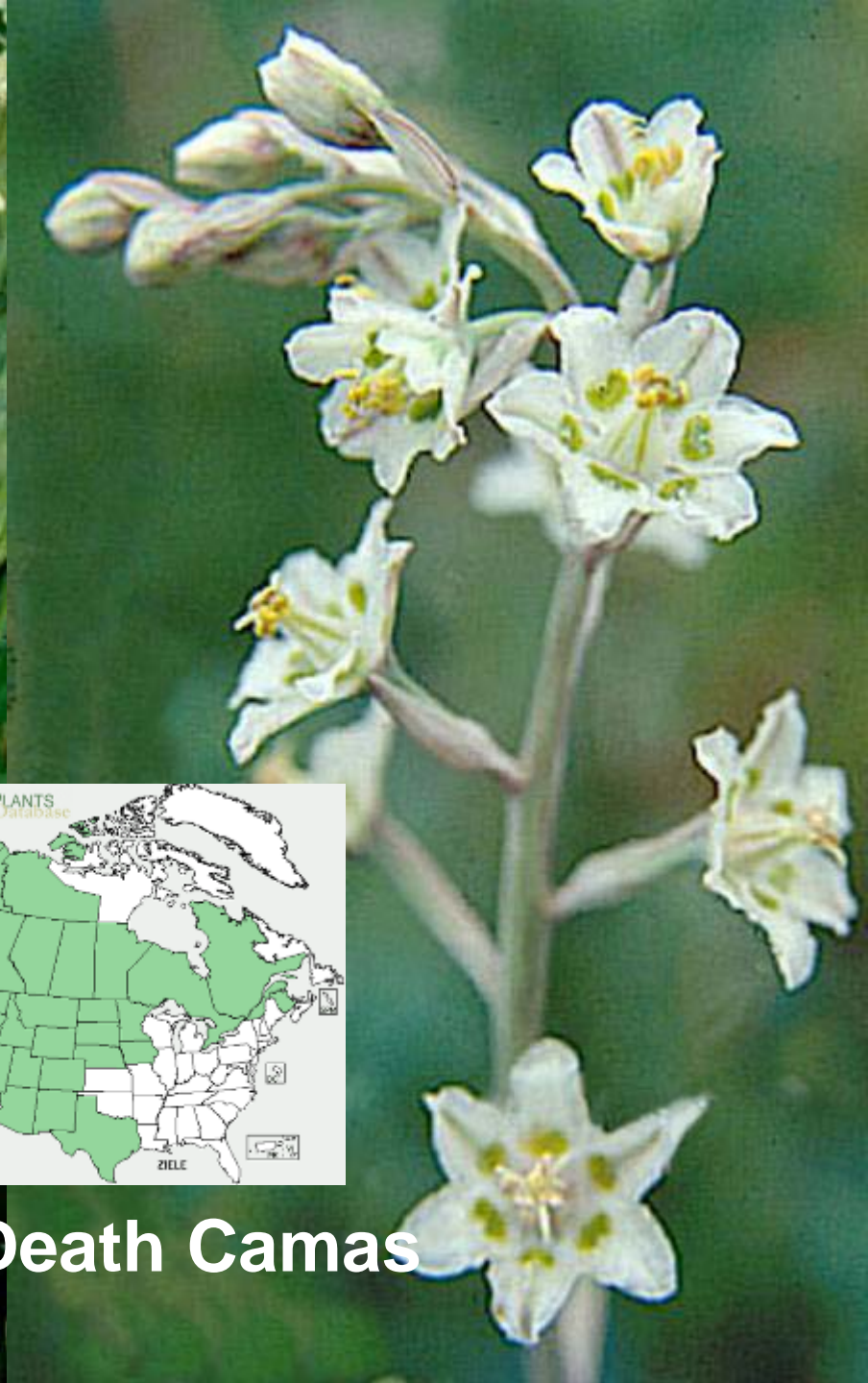
**Foothills Death Camas**  
*Zigadenus paniculatus*





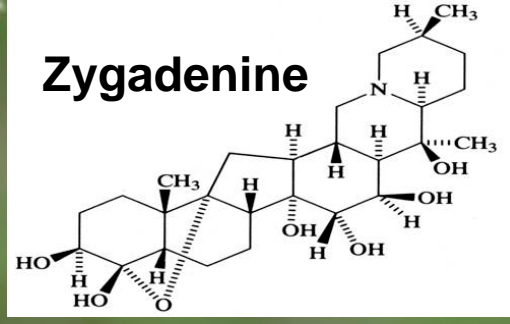
***Meadow Death camas***  
***Zigadenus venenosus***



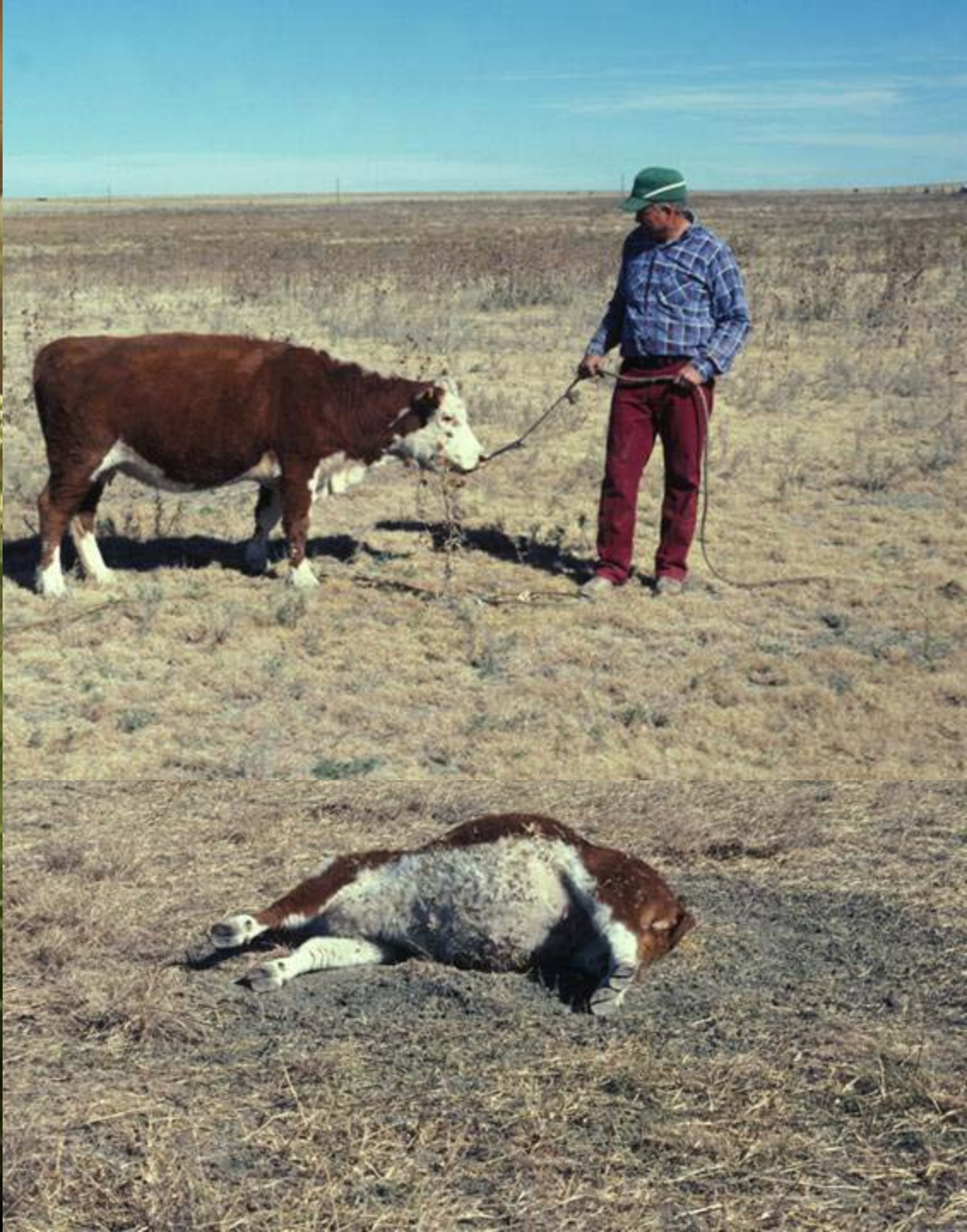


**Mountain or Elegant Death Camas**  
***Zigadenus elegans***











# Milkweeds (*Asclepias* spp.)





# Milkweeds

## *Asclepiadaceae*

*Asclepias speciosa*







**Whorled Milkweed**  
*Asclepias subverticillata*



**Showy Milkweed**  
*Asclepias speciosa*



- Throughout North America
- Narrow leaved species most toxic
- Principal Toxin:  
Cardenolides  
Digitalis-like glycosides
- All animals susceptible
- >2%. toxic
- Toxic in hay



**Dwarf milkweed**  
*Asclepias pumilla*



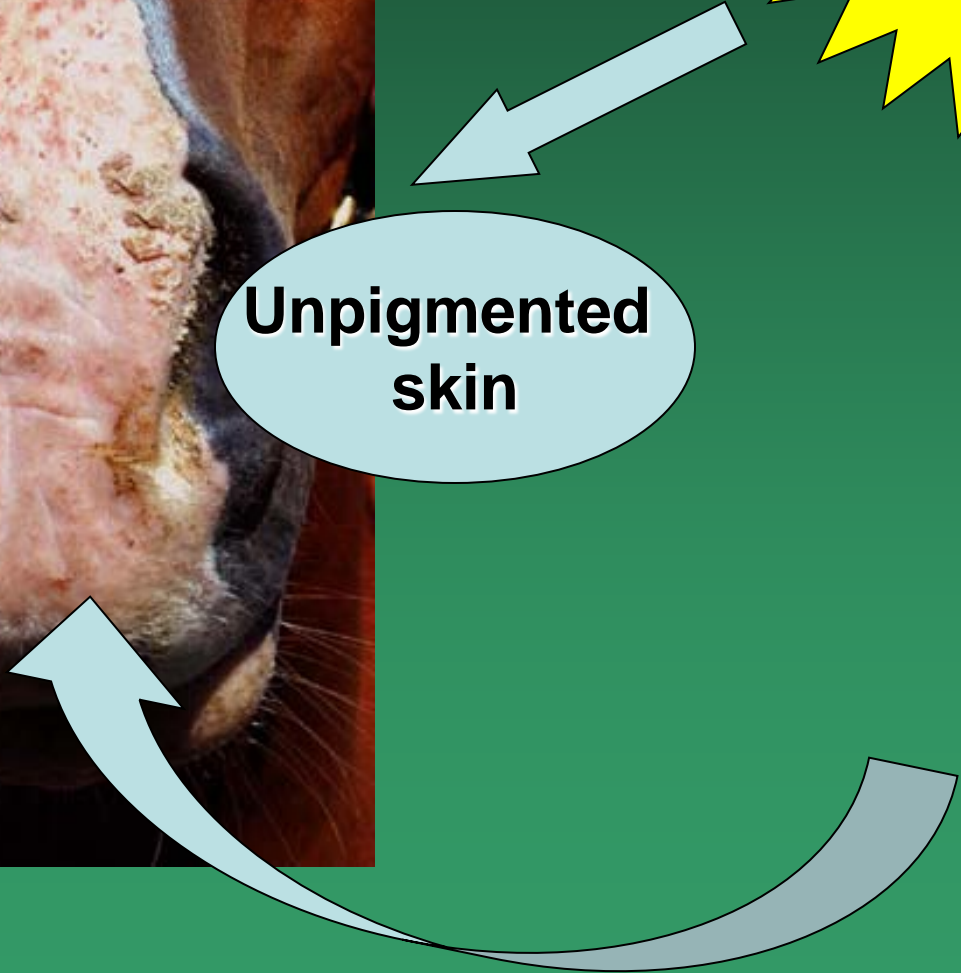
# Photosensitization







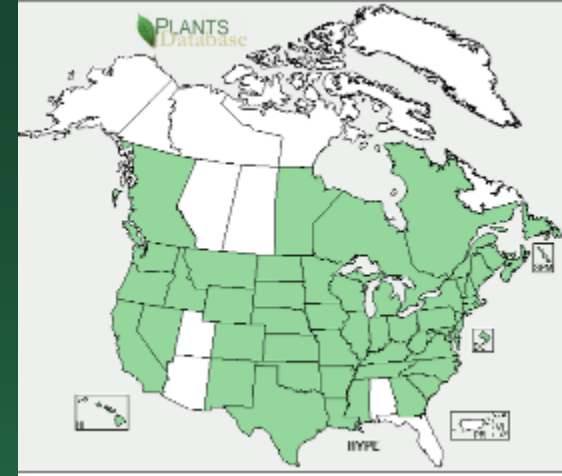
**Unpigmented  
skin**





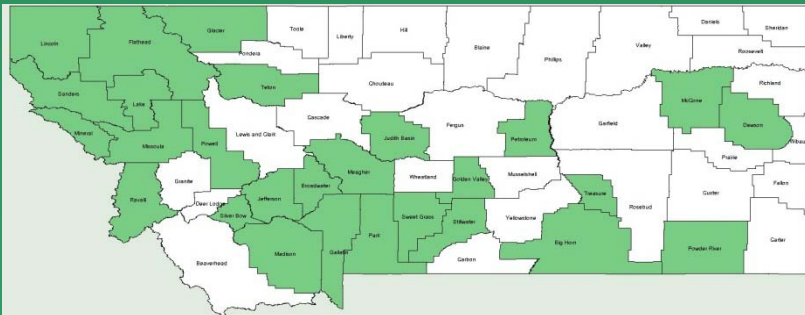
# St John's wort

## *Hypericum perforatum*



A Noxious Weed of the North  
Western States

Other Primary Photosensitizers  
Buckwheat (*Fagopyrum esculentum*)  
Spring parsely (*Cymnopteris spp.*)







**Secondary photosensitivity**  
**- Poor prognosis**  
**80% liver damaged**



# Hounds tongue (*Cynoglossum officinale*)

Pyrrolizidine alkaloids



Noxious  
Weed





**Hounds Tongue**  
*Cynoglossum officinale*



# Senecio, groundsel

Pyrrolizidine alkaloids









# Treatment

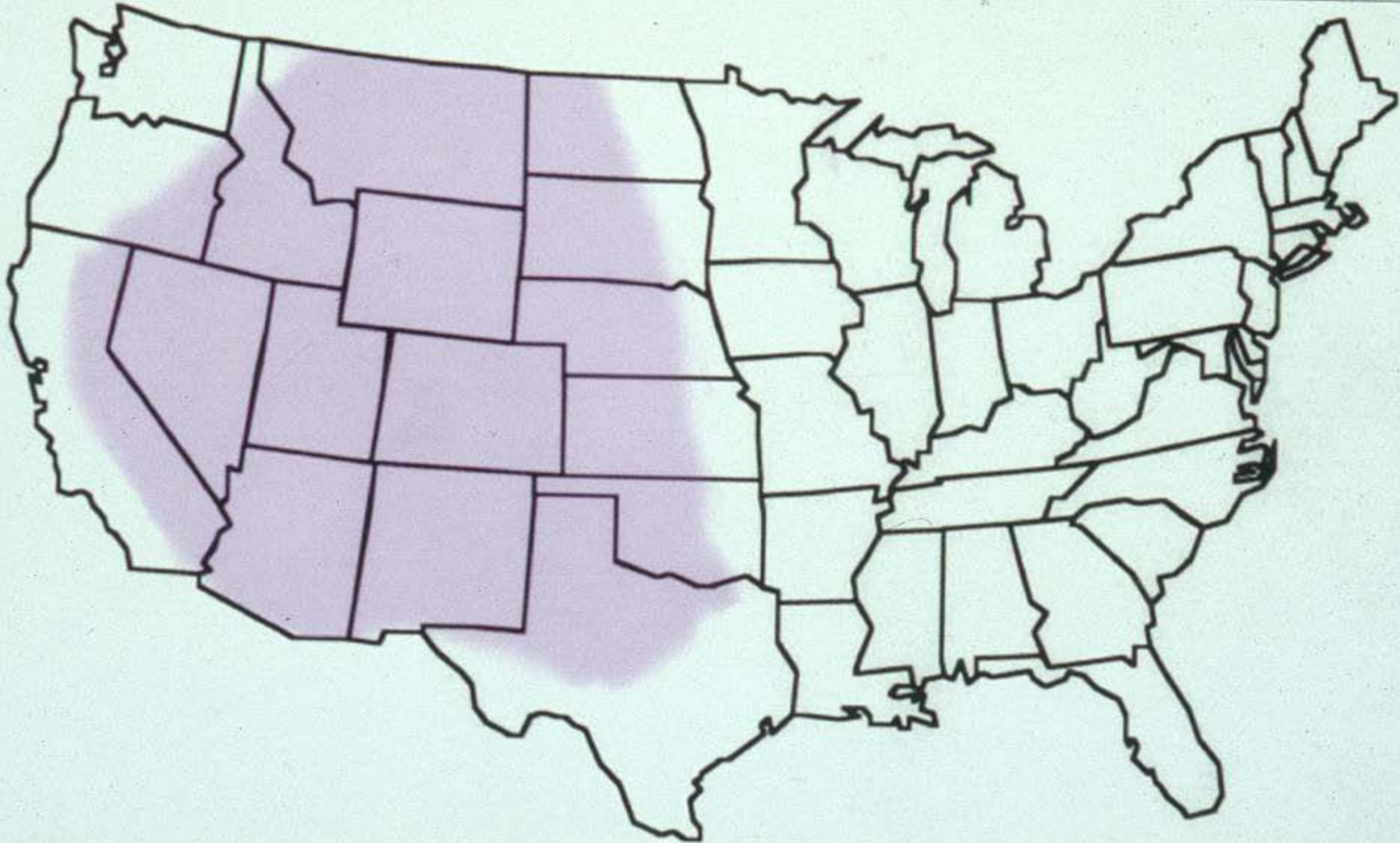








# Locoweed Distribution





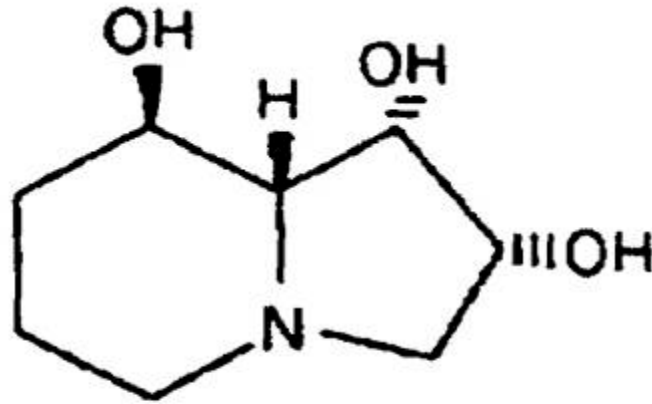


***White locoweed***  
***Oxytropis sericea***



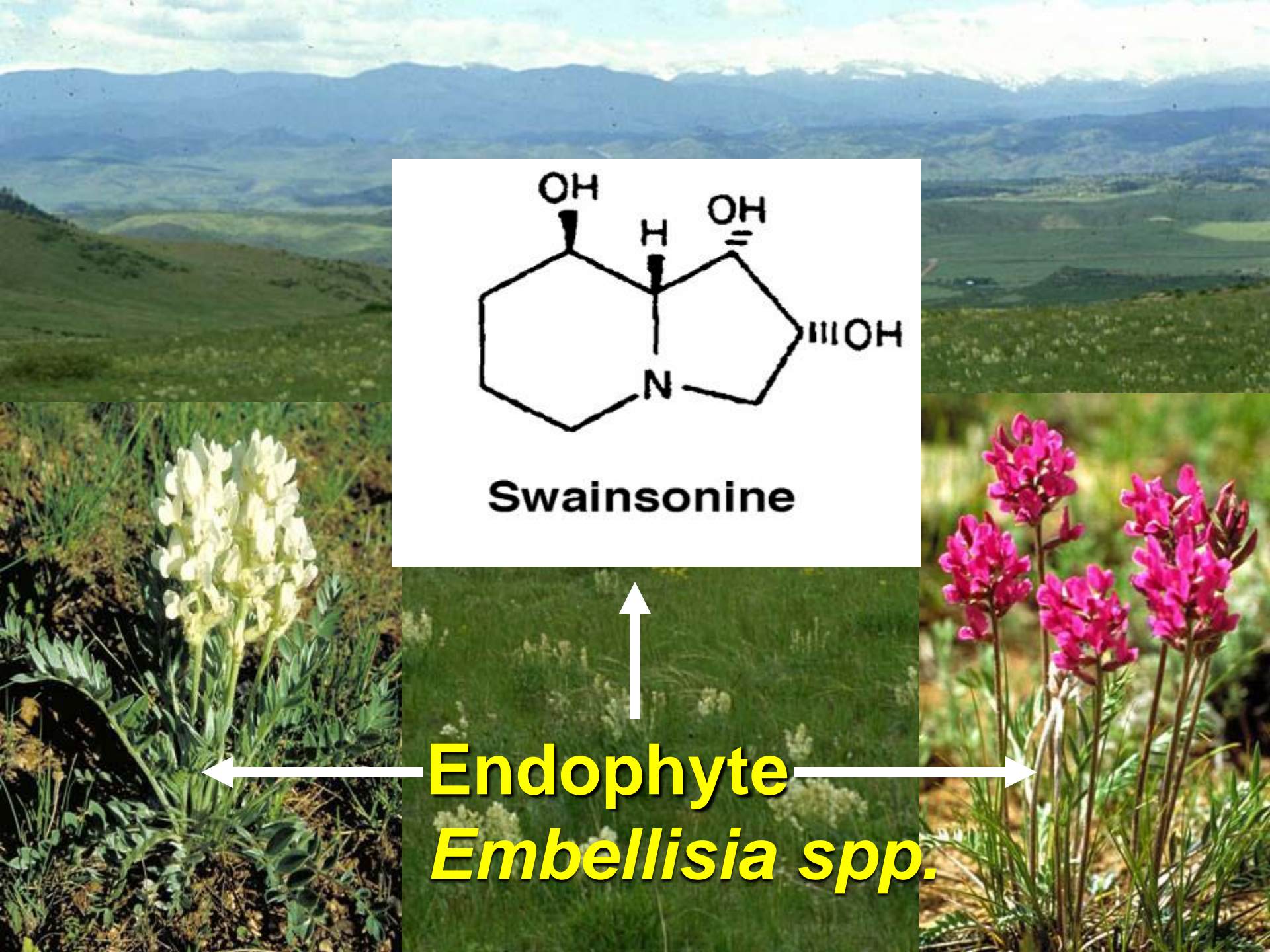
***Purple locoweed***  
***Oxytropis lambertii***





**Swainsonine**

**Endophyte**  
***Embellisia* spp.**

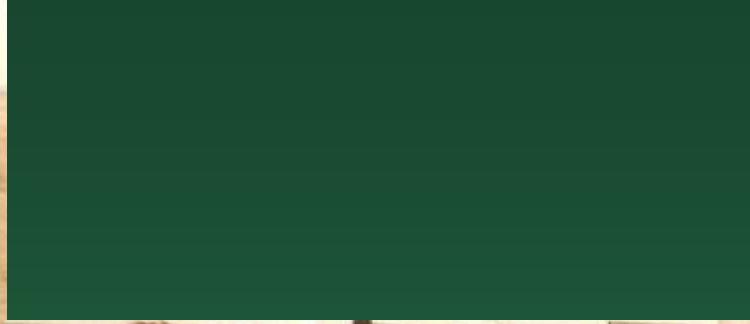






***Embellisia spp.***



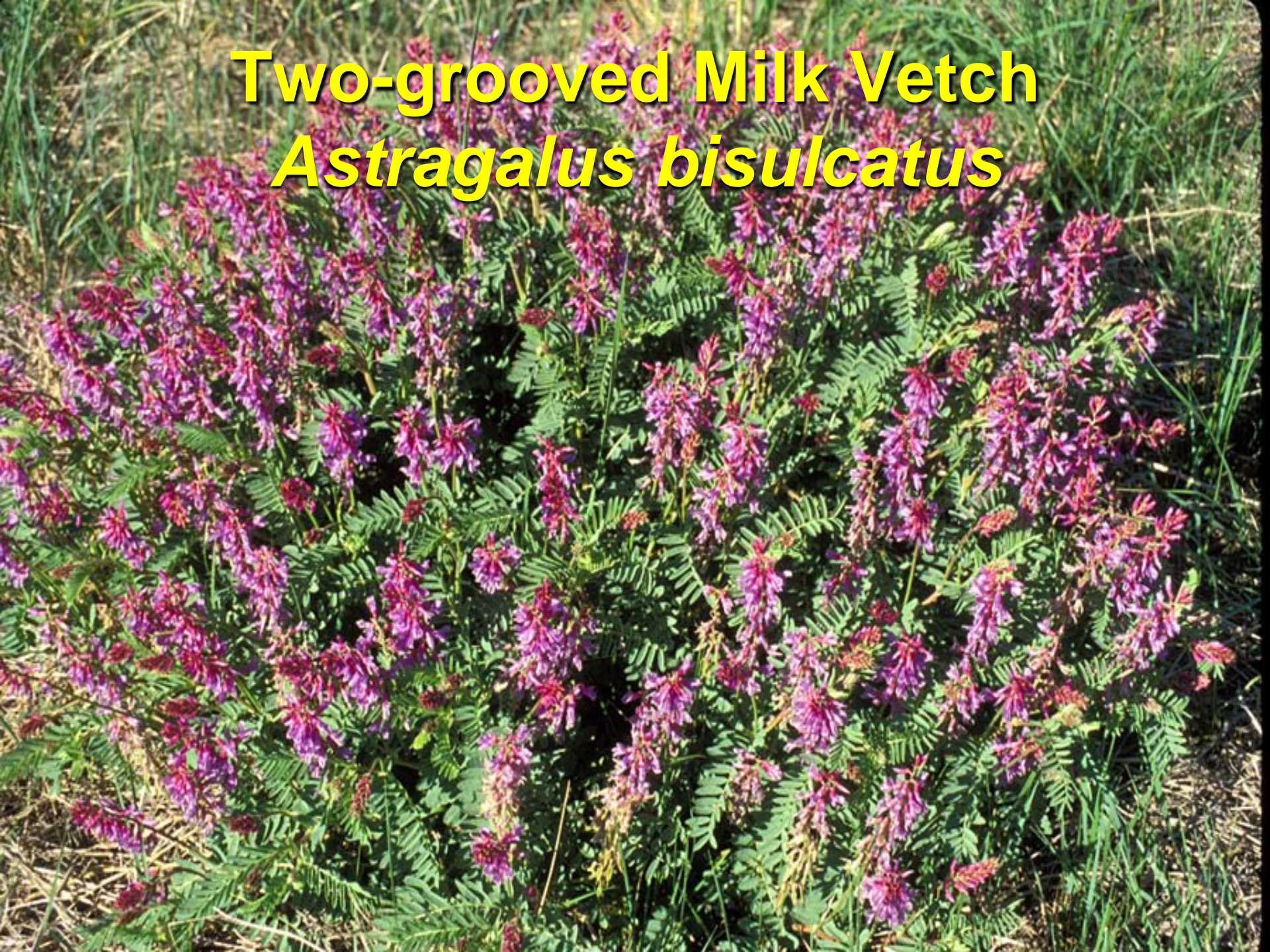








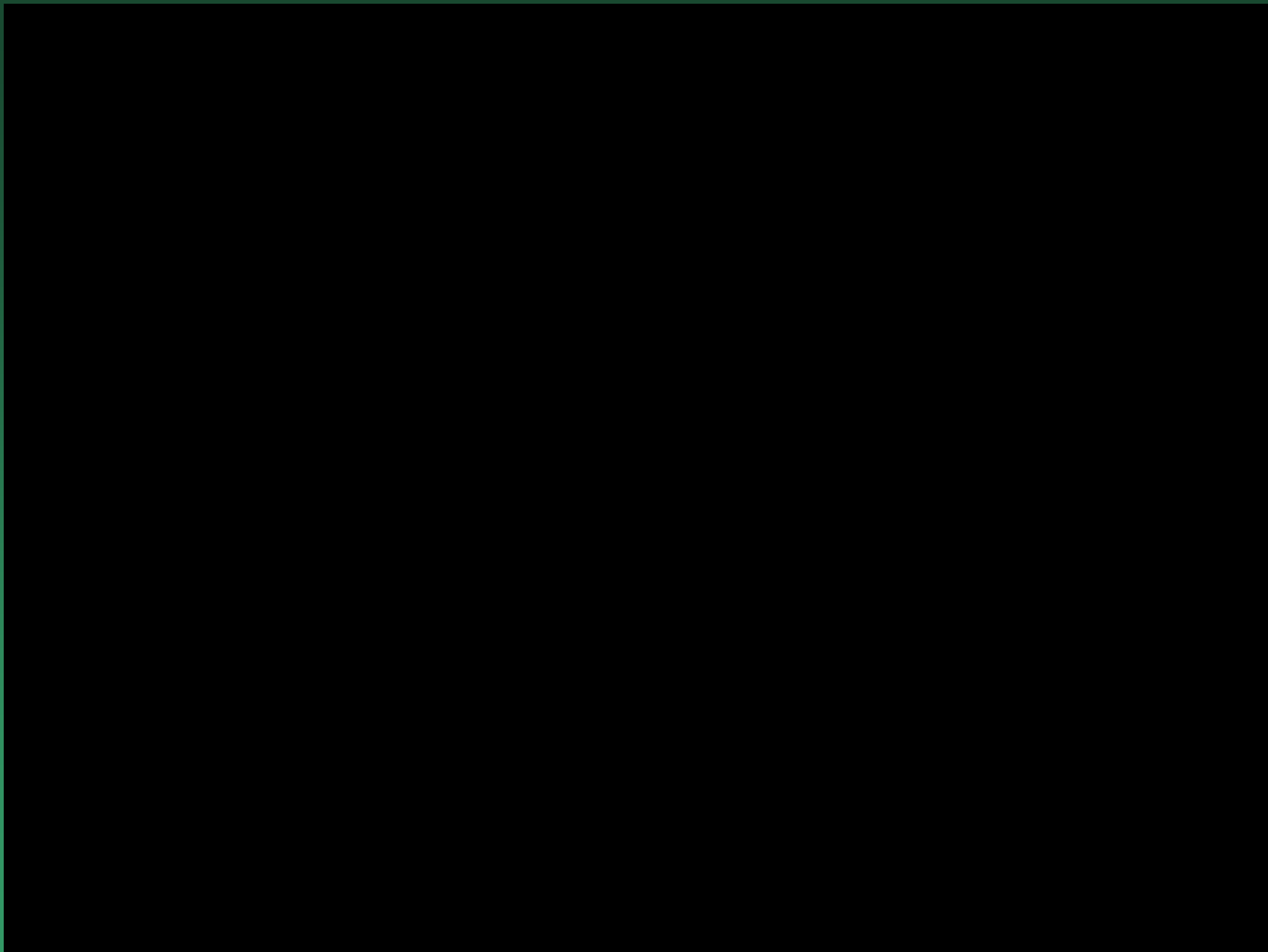
**Two-grooved Milk Vetch**  
***Astragalus bisulcatus***

















**Russian Knapweed**  
*Acroptilon repens*



**Affects only horses.  
Inability to bite off  
and chew food.**



**Spotted Knapweed - *Centaurea maculata***

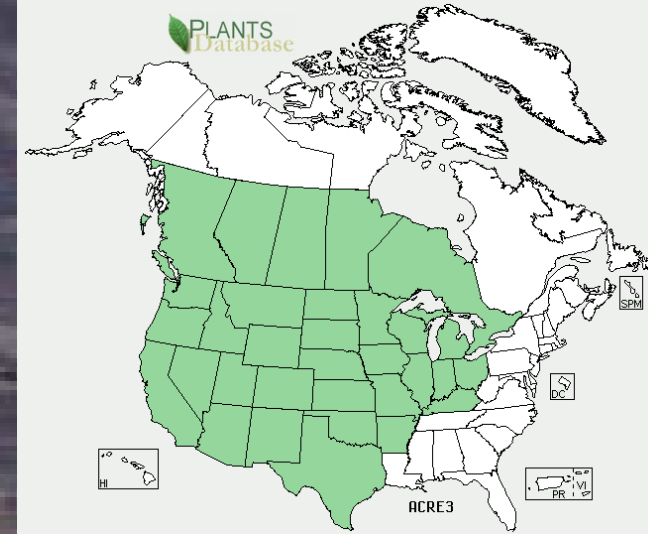


**Russian Knapweed  
*Acroptilon repens***



# Russian Knapweed

## *Acroptilon repens*

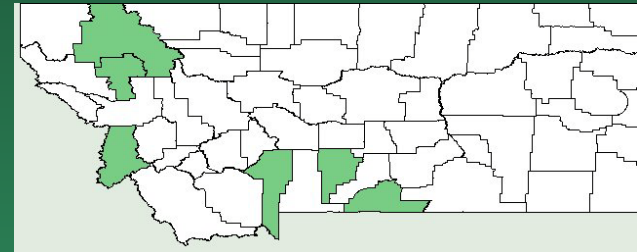


**Affects only horses.**  
**Inability to bite-off and chew food.**  
**Must eat 50-60% body weight**  
**Irreversible brain damage**



# Yellow star thistle

## *Centaurea solstitialis*



**Noxious annual weed**  
**Present in most States**  
**Affects horses only,**  
**causing inability to**  
**prehend and chew food.**  
**Irreversible brain lesions**



## 'Chewing Disease'

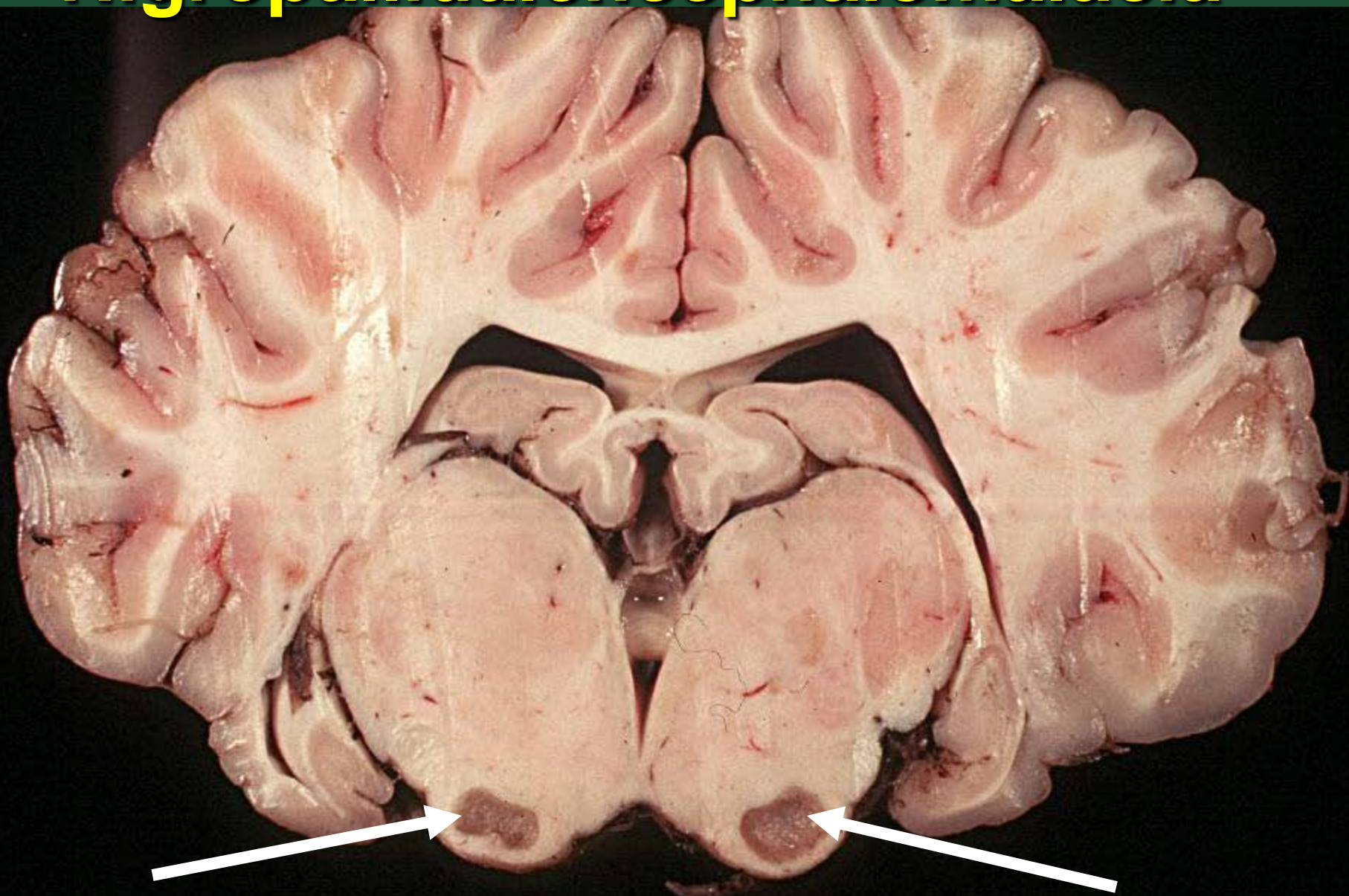


**Sudden onset of signs:  
Inability to bite-off and chew food  
Can swallow.  
No treatment**





# Nigropallidalencephalomalacia









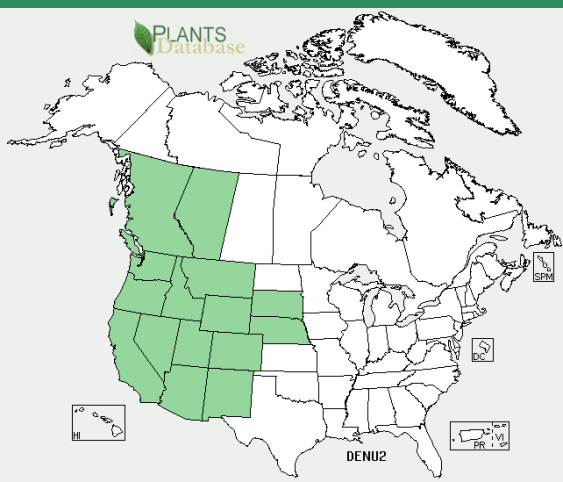
# Delphinium glaucescens



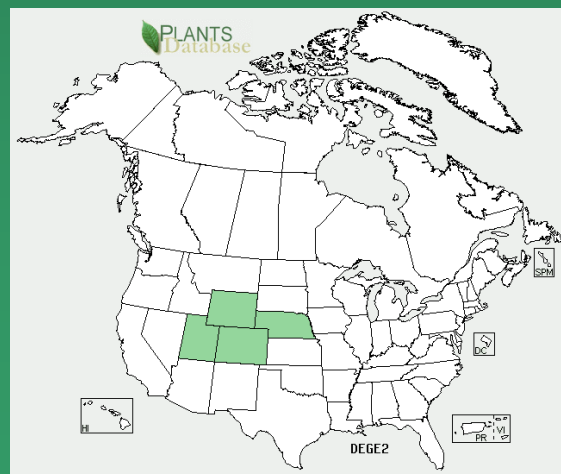




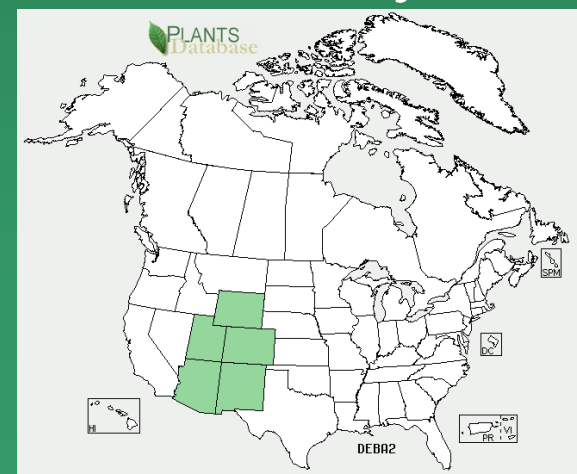
*D. nuttallianum*



*Delphinium. geyeri*



*D. barbeyi*





# Larkspur Poisoning

Diterpenoid alkaloids

Most toxic pre-flowering

Tall larkspurs most  
poisonous

Cattle < horses < sheep

Death due to paralysis  
and rumen bloat





# Larkspur Poisoning

Sudden death

Staggering gait

Bloat

Respiratory failure





# Larkspur Control

Herbicides

Picloram (Tordon)

Metsulfuron (Escort)

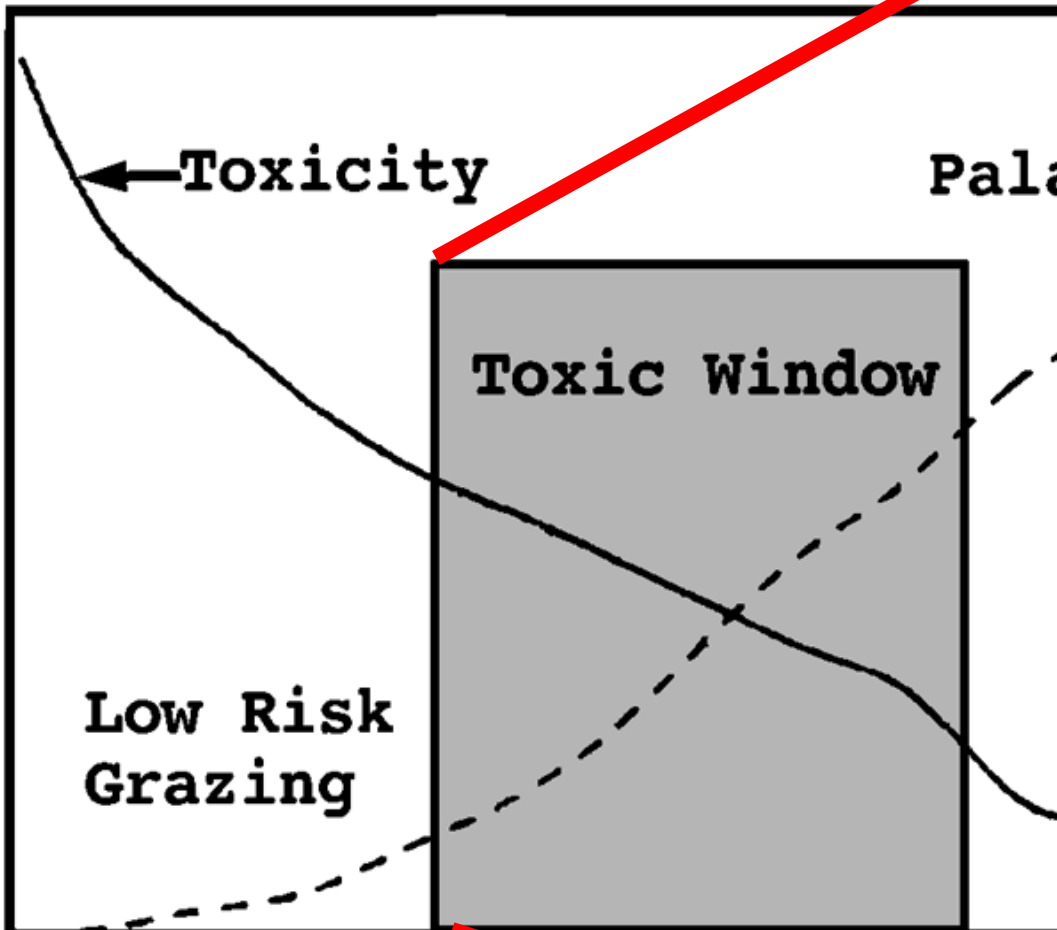
Biological controls





High

Relative Toxicity



Palatable

Toxic Window

Low Risk  
Grazing

Low

Vegetative

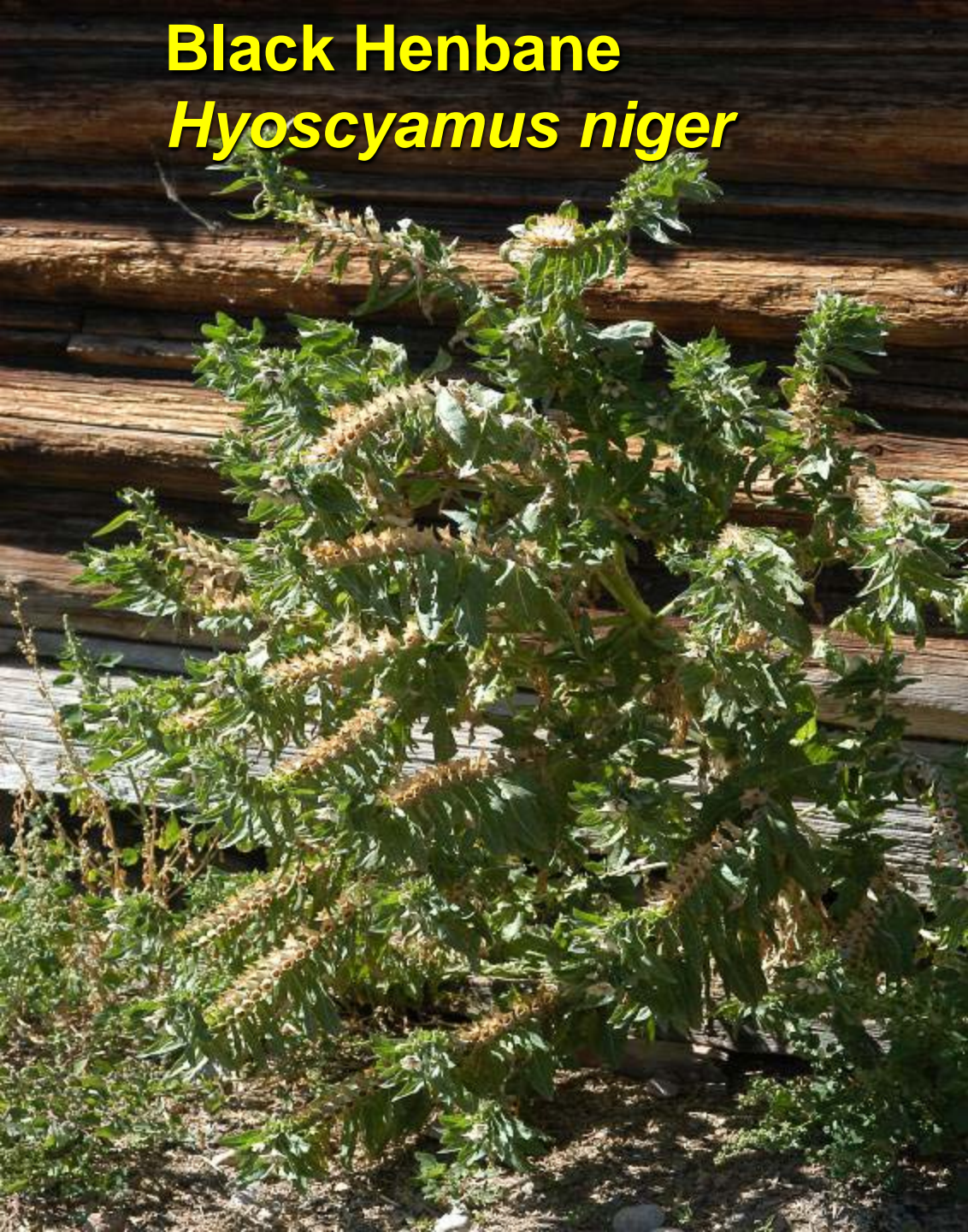
Flower

Phenological Stage





**Black Henbane**  
*Hyoscyamus niger*

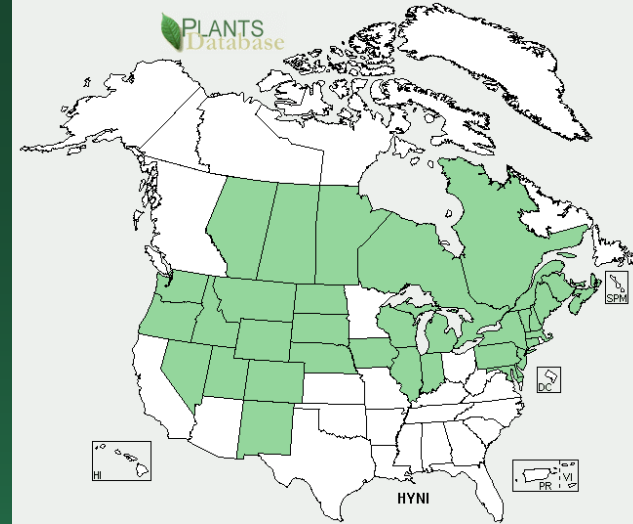




# Black Henbane

## *Hyoscyamus niger*

- Noxious biennial weed
- Toxic alkaloids
- Clinical Signs
  - Intestinal stasis
  - Colic
  - Dilated pupils
  - Respiratory failure
  - Halucinations-Seizures









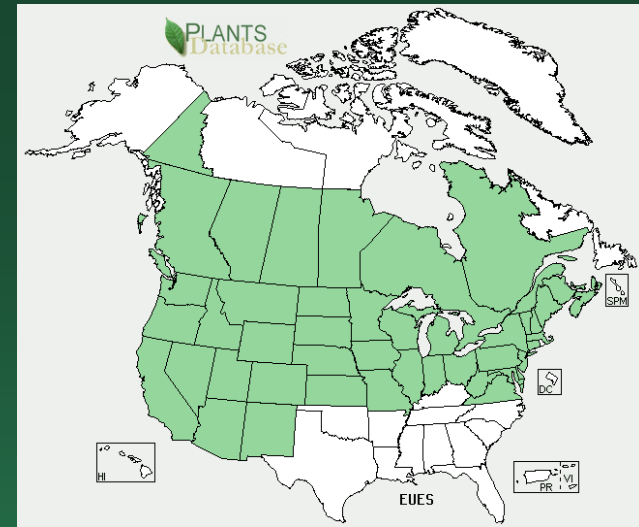
# Leafy Spurge

## *Euphorbia esula*

### *(Tithymalus uralensis)*

Noxious invasive weed  
Perennial  
Spreads via roots and seed

Toxins – diterpenoid esters  
Skin irritant  
Unpalatable to cattle/horses  
Sheep & goats graze it well







Selenium-rich soils



## Selenium Toxicity





**Prince's plume**  
***Stanleya pinnata***



**Se**



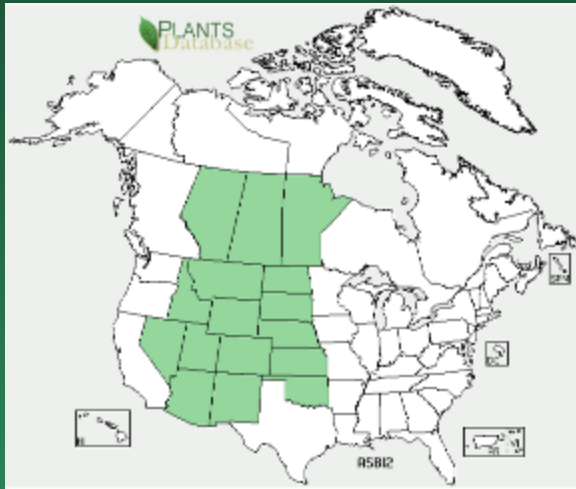
**Woody Aster**  
***Xylorrhiza gabriuscula***

**Obligate selenium  
accumulator**





# Two-grooved Milkvetch



- Selenium accumulator  
- a Se indicator plant
- Locoism





# Selenium toxicity

**Se** displaces **S** in the formation of the keratin, the major protein of hoof and hair





# Chronic selenium poisoning “Alkali Disease”





# Chronic Selenium Toxicity



Courtesy Connee Quin



# Prevention of Chronic Se Poisoning

Ensure adequate Copper in the ration and/or mineral supplement.

Provide Sulfur in the diet



**Alfalfa**





# References

- \* **USDA Plant Database**
- \* **A Guide to Plant Poisoning of Animals in North America**  
**A.P. Knight, R.G. Walter**
- \* **Weeds of the Great Plains**  
**J. Stubbendieck, M.J. Coffin, L.M. Landholt**
- \* **Weeds of the West**  
**Tom D. Whitson**
- \*\* **[http://southcampus.colostate.edu/poisonous\\_plants](http://southcampus.colostate.edu/poisonous_plants)**





# Noxious Weeds



Leafy Spurge – *Euphorbia esula*

**Montana Noxious Weed List**



# **A Guide to Plant Poisoning of Animals in North America**

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**[www/southcampus.colostate.edu/poisonous\\_plants](http://www/southcampus.colostate.edu/poisonous_plants)**



# Questions?

