Most poisonous plant problems occur when managers make mistakes

Poisonous plant problems are management problems

- Overgrazing
- Lack of Supplementation
- Season of use
- Hungry or stressed animals
- Livestock avoid eating most poisonous plants even though they are very nutritious
  - Aversive postingestive feedback
  - Most toxins are present in plants to discourage insects and animals from eating them

Feedback from the gut

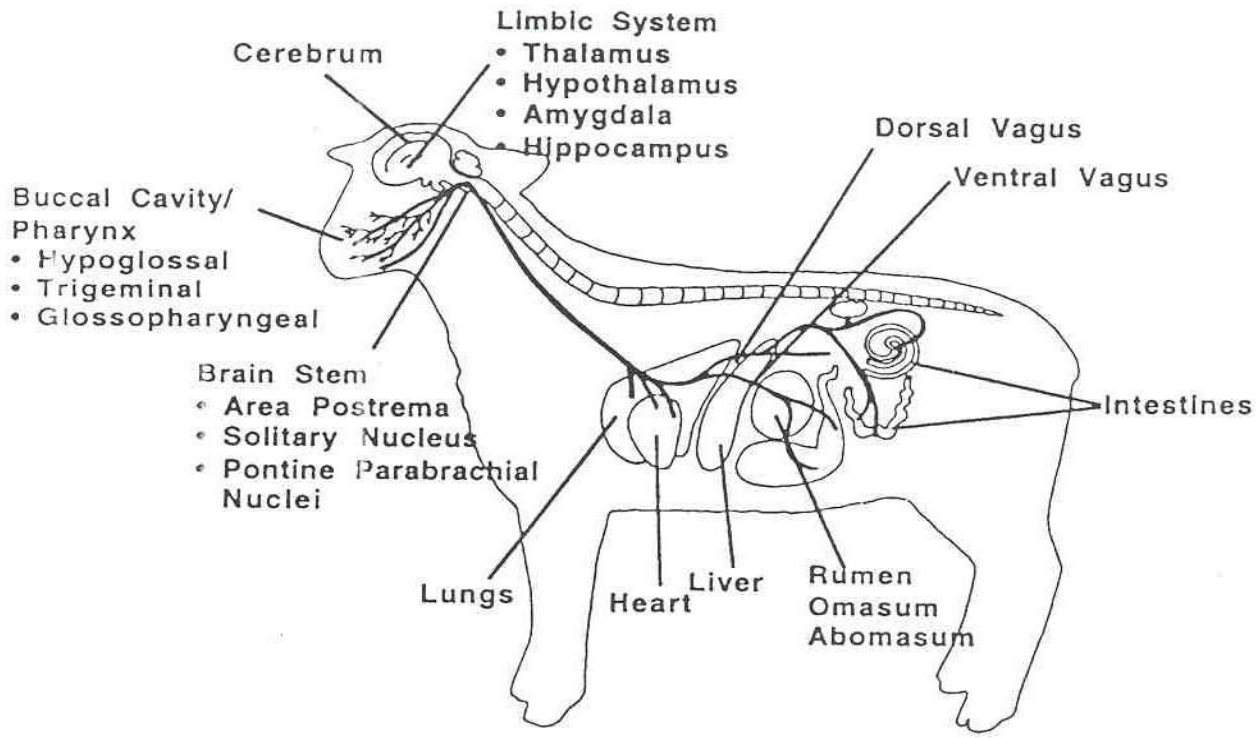


Fig. 3. The senses, visceral nerves, the brain stem, limbic system, and higher cortical centers interact through neuronal fibers that can facilitate or inhibit behavior. Gustatory and visceral afferent nerves that first synapse in the brain stem (involved with visceral, cardiac, and respiratory functions) proceed to the limbic system (concerned with emotional memory). Feedback from the gut to the brain stem and limbic system causes changes in preference for particular foods, which are non-cognitive and depend on the food's effect on the internal environment. On that basis, higher cortical centers (involved with declarative memory) interact with the limbic system to facilitate changes in food selection behavior.

Effects of Poisonous Plants

- Heptatoxin
- Nephrotoxin
- Cardiotoxin
- Neurotoxin
- Reproductive toxin
- Teratogen
- Gastrointestinal toxin
- Myotoxin
- Mycotoxin

Milkweeds

- Broadleaf milkweed
- Antelope horn milkweed
- Found on both rocky and sandy soils
- 1 to 3 oz of intake
- Cardiac glycoside
- Stops heart
- Unpalatable

Bitterweed

- Cool season weed
- Begins growing early
- 1-6% death loss annually
- Primarily affect sheep
- Most toxicity cases in winter and early spring
- Affects liver, kidney, digestive tract, brain
- Unpalatable

Locoweeds

- Several different species
- Toxic to all classes of livestock
- Cattle and horses very susceptible
- Toxicity usually occurs in spring
- Alkaloid causes neurological damage
- Unpalatable

Silverleaf nightshade

- Common in fields, pastures, and pens
- Alkaloids that cause neurological problems and acute poisoning
- Unpalatable
- Harvested in hay
- Hungry animals (held overnight in pens)

Potatoweed

- Common in fields
- May cause abortions
- Nutritional deficiency may lead to consumption
- 0.1 to 0.3% of BW may cause toxicity
- Neurological damage

Buffalobur

- *Solanum rostratum*
- Deeply clefted leaves
- Annual
- Numerous prickles
- Yellow flowers
- Seeds consumed by birds
- Disturbed sites
- Poor forage

Kocha

- *Kochia scoparia*
- Annual
- Upright forb that grow 2-5 feet tall
- Common on disturbed sites and old fields
- Fair forage, but contains several toxic compounds in low levels that could cause health problems if enough is consumed

Russian Thistle

- *Salsola ibertica*
- Annual
- Common name is tumbleweed
- Slender leaves
- Dark purple strips on stems
- Common on disturbed sites
- Contains nitrates that interfere with oxygen transfer

Tansy mustard

- *Descurainia pinnata*
- Cool season annual
- Matures in spring, early summer
- Mustard family with seeds attached to upper portion of stem
- Long slender leaves
- May cause photosensitization in livestock

Nuttall peavine

- *Astragalus nuttallianus*
- Annual
- Native
- Throughout Texas in Spring
- Pinnately compound leaves on short petiole
- Procumbant growth
- Toxic

Low larkspur

- *Delphinium bicolor*
- Perennial
- Native
- Flowers as racemes with spurs
- Leaves widely dissected
- Toxic

Tall larkspur

- *Delphinium occidentale*
- Perennial
- Native
- Flowers as racemes with spurs
- Leaves palmately divided
- Rocky mtns/ high elevations
- Toxic

Corn

- Agricultural feed
- Fed to livestock and wildlife
- May contain a fungus that produces aflatoxins
- Typically occurs in drought when corn is damaged by insects
- Exposes the kernels to mold growth
- Neurological and liver damage leading to death
- Birds highly susceptible
- Acceptable levels: Cattle = 100 ppb, horses = 50 ppb, wildlife = 50 ppb, birds = 20 ppb

Cottonseed

- Cottonseed contains gossypol
- Toxic to swine
- Ruminants can consume some gossypol
- Chemically extraction of oil frees up gossypol
- Anemia and ultimately heart failure
- Reproductive problems in young growing males

Blister beetles and alfalfa

- Blister beetles feed on alfalfa
- Contain cantharidin
- Beetles crushed during harvesting –releases toxin
- Digestive disorders and affects heart
- Usually leads to death within 72 hours
- Horses especially susceptable

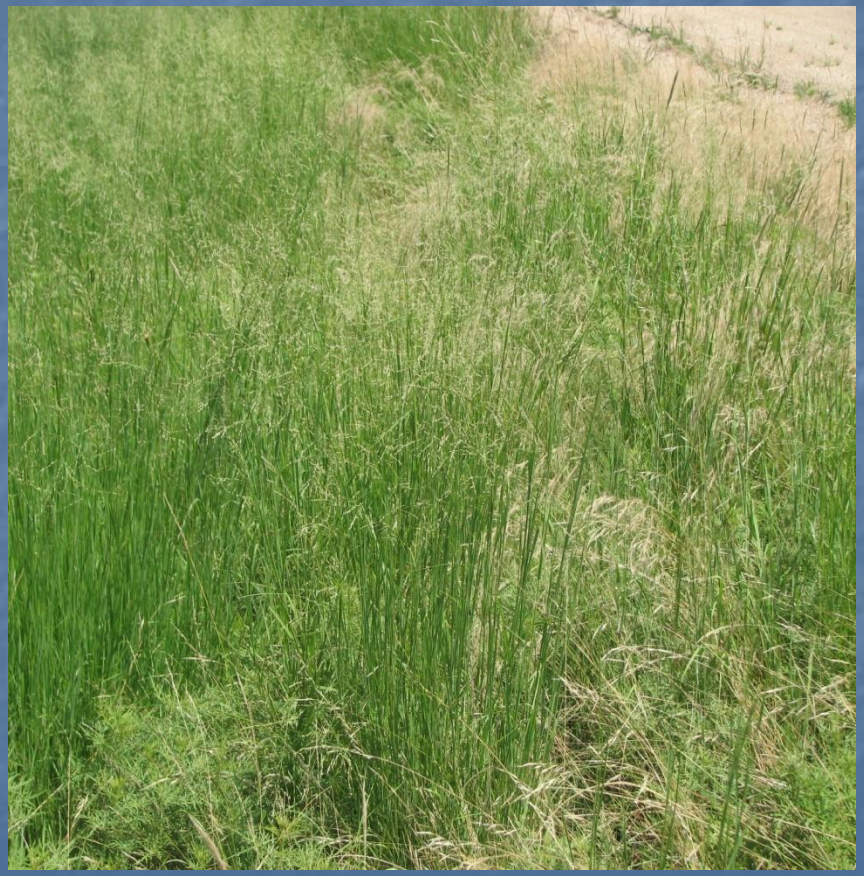
Twin-leaf senna

- Death losses occur about every five years on average
- Typically in spring
- Heart failure
- Toxin unknown
- May be associated with a mineral deficiency
- Unpalatable

Saccahuista

- Edwards Plateau
- Consumption of flowers
- Causes “Swell Head”, particularly in sheep
- Liver damage
- Unable to metabolize chlorophyll

Kleingrass



- Introduced grass
- Excellent forage
- Monocultures may cause photosensitization in sheep
- Liver damage reducing ability to metabolize chlorophyll

Lantana

- Common ornamental
- Causes “swell head” or photosensitization
- Common problem in sheep

Oleander

- Ornamental
- Highly toxic
- Consumption results in death
- Cardiac glycoside
- Heart failure
- Dumped with lawn clippings
- 0.005% BW results in death of cattle and horses

Shin oak

- Sandy soils in Rolling Plains and High Plains of Texas
- 30 days after bud-break
- Primary cattle
- Tannins damage kidney and digestive tract

Prussic Acid

- Haygrazers, Sudangrasses, and Johnsongrass
- Damaged from frost or drought releases prussic acid
- Converted to cyanide in rumen

Broom snakeweed

- Western Texas
- Overgrazed situations
- Causes abortions
- Estimated losses in 1988 were $40 million
- Affects cattle primarily
- Animals must be hungry to consume

Threadleaf groundsel

- *Senecio longilobus*
- Perennial evergreen
- Leaves slender and gray in color
- Stems grey
- Disk and ray flowers
- Once flowers mature, they turn white
- Contain pyrrolizidine alkaloids that are highly toxic
- Typically avoided by livestock unless forage is limited

Ponderosa pine

- *Pinus ponderosa*
- Western U.S.
- Large tree
- Leaves is fascicles of three
- Primary timber plant
- Poor forage

Coyotillo

- *Karwinskia humboldtiana*
- Toxic
- Distinct vein pattern in leaves
- Native
- South Texas
- Animals die of pulmonary edema

Chokecherry

- *Prunis virginiana*
- Fruit is a drupe
- Throughout central and northern U.S.
- Poor browse

Willow baccharis

- *Baccharis salicina*
- Not a willow, sunflower family
- Toxic
- Reproduces by seeds and by rhizomes
- Prefer wet sites along rivers, streams, lakes
- Native plant, but planted to control erosion
- Rapidly spreading and invading mesic sites throughout state
- Can be controlled with some herbicides

Redberry Juniper

- *Juniperus pinchottii*
- Red berries
- Small shrub with numerous stems
- Basal bud zone
- White spots on leaves from ruptured monoterpene glands
- Fruit consumed
- Poor browse
- Cover for livestock and wildlife
- Invasive plant that can be controlled if budzone is uprooted using mechanical means

Determining Cause of Problem

- Overt symptoms
- History
- Blood chemistries
  - AST, GGT, BUN, Creatinine, Bilirubin
- Poison Plants on property
- Have they been eaten?
- Necropsy
  - Liver, Kidney, Digestive tract lesions
- Educated guess

"All substances are poisons; there is none which is not a poison. The right dose differentiates a poison and a remedy."

Pop Quiz