



Managing Toxic Weeds in Your Pastures

2014 WI Grazing Conference

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^{UW}
Extension
Cooperative Extension

Drought impacts on pastures...



Many looked like this in mid summer



The only thing not eaten were weeds



Managing toxic weeds in your pastures; outline

- When and where poisoning occurs
- What makes plants poisonous?
- Prevention – pasture management
- Toxic plants
 - A4019
 - High, medium, and low levels of toxicity
 - Crop plant issues
 - Misc.

When and where poisoning occurs

- Mostly in early spring, fall, or dry periods when grasses are in short supply
 - Following drought!
- Pasture margins – fencerows, tree lines, ditches, waste areas
- More common in animals unfamiliar to a pasture e.g. after shipping
- Clippings from ornamentals



Situations that can favor poisoning:

- Animals have been put onto pasture for the first time in the spring
- Animals are very hungry
- Animals are moved to a new pasture
- Poisonous plants became more palatable following a herbicide application
- Animals not in top condition
- A new forage is being fed



What about hay?

- It is harder to control poisonous plants that might be present in purchased hay and also harder for your sheep to avoid dried and broken parts of plants
- If possible, walk the hay fields where your hay is harvested



What makes plants poisonous?

- Alkaloids – nightshade family
- Glycosides – wild cherry and sudangrass; the glycosides they contain are converted to cyanide
- Thiaminase – bracken fern and horsetail
- Photosensitizers – St. Johnswort, alsike clover

Signs of poisoning differ in clinical symptoms and severity depending on:

- Kind of plant eaten
- Stage of growth
- Amount eaten
- Amount and kind of other feeds eaten
- Tolerance of the animal to the poison ingested



Ruminant vs. Monogastric



Diet Selection of Livestock

| Type | Horses | Cattle | Sheep | Goats |
|-----------------------|--------|--------|-------|-------|
| ----- % of diet ----- | | | | |
| Forage ^a | 90 | 70 | 60 | 20 |
| Weeds | 4 | 20 | 30 | 20 |
| Browse _b | 6 | 10 | 10 | 60 |

^a A mixture of grass and legumes

_b Woody material

Symptoms:

- Slight illness
 - inability to perform to its fullest potential for a few days
- More serious symptoms
 - slobbering, tremors, uncoordination, erratic behavior, convulsions or even sudden death
 - blisters, swelling and lesions (like severe sunburn) on light colored areas of the skin.



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First Aid

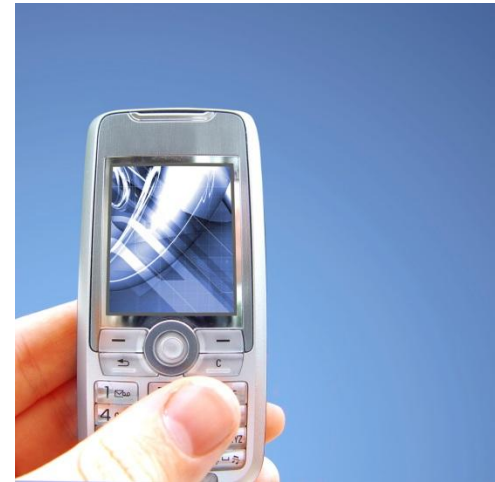
- Remove animal from area where toxic plants are present; remove affected feed or forage
- In the case of photosensitizing agents, get animal into shade and treat secondary infections



If poisoning is suspected?

Call a veterinarian

Immediately



Preventive Measures



- Learn to identify poisonous plants
- Learn the conditions under which these plants can be dangerous to your livestock.
- Scout your pastures; be sure to check fence lines and several feet beyond
- Control poisonous plants where feasible



Prevention

- Provide hay in sacrifice areas and turnout lots.
- When away from the farm for trail rides or shows, watch horses closely to ensure that they don't eat something they shouldn't.
- Some toxicities take repeated consumption over time, so monitor horses closely on a daily basis and note any change in physical appearance or behavior.



Prevention

- DO NOT OVERGRAZE PASTURES!
- Good pasture management is key!
 - Soil testing
 - Fertilization and liming
 - Don't overgraze
 - Clipping
- Develop a grazing plan
- When grazing a new area or newly seeded pasture,
 - Introduce the animals slowly
 - Monitor for any physical change or change in behavior



Weed Control Methods

2 to 5 pounds of grass growth for every
1 pound of weeds controlled

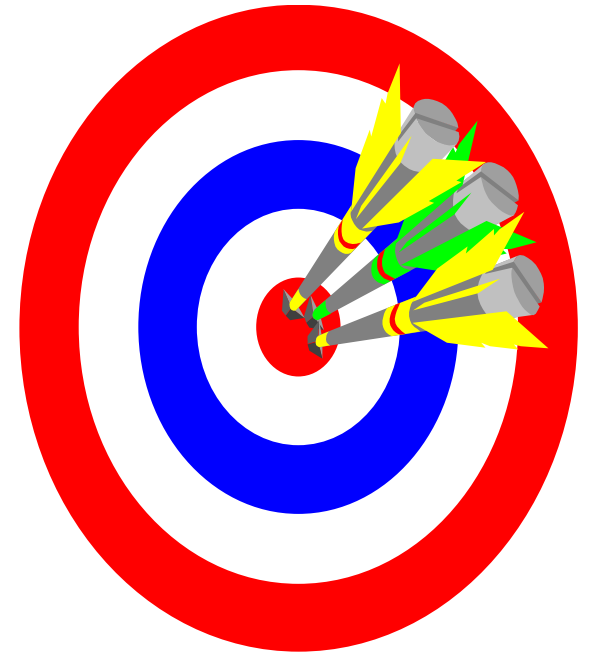
- **Mechanical**

- Mowing
- Fire
- Hand weeding

- **Biological**

- Mulch
- Grazing
- Crop Competition

- **Chemical**



Herbicides for Pasture Use and Grazing Restrictions

| Herbicide | Rate | Grazing | Harvest |
|--|-----------------------|----------------|----------------|
| Chaparral ® (aminopyralid + metsulfuron) | 1-3.3 oz/acre | 14 days | 14 days |
| Crossbow ® (triclopyr + 2,4-D) | 1-4 qt/acre | 14 days | 14 days |
| Curtail ® (clopyralid + 2,4-D) | 2-6 pt/acre | 14 days | 14 days |
| Dicamba | 0.5-1 pt/acre | 10-14 days | 14 days |
| Escort ® (metsulfuron) | 0.1-1 oz/acre | 14 days | 14 days |
| Forefront ® (aminopyralid + 2,4-D) | 19-34 fluid oz/acre | | 7 days |
| Glyphosate | Varies | 14 days | 14 days |
| Milestone ® (aminopyralid) | 3-7 fluid oz/acre | | 7 days |
| Overdrive ® (dicamba + diflufenzopyr) | 4-8 oz/acre | None | None |
| Spike ® (tebuthiuron) | 20 lb/acre | | 12 months! |
| Stinger ® (clopyralid) | 0.33-1.33 pt/acre | 14 days | 14 days |
| Weedmaster ® | 1-2 pt up to 2qt/acre | 7 days | 37 days |

Calibrating and Spraying

- Follow sprayer instructions to calibrate
- Mix according to label
- In small paddocks
 - spot spraying for weeds is recommended right after animals are removed from a paddock
- Check the herbicide label for the recommended waiting period before animals can be put back into the pasture.
 - If horses are not listed, call the company(on label).



Learn to identify plants in your pastures that might be poisonous to your animals



A4019

Toxic Plants in Midwest Pastures and Forages

Rhonda Gildersleeve, Anders Gurda, Peg Reedy, Mark Renz

A4019 separates plants into three categories:

- Highly toxic – small amounts (<5% of feed can result in serious injury/death)
- Moderately toxic – moderate amounts (>5-25%) can result in injury/death
- Mildly toxic – under certain environmental or management conditions these plants can be toxic

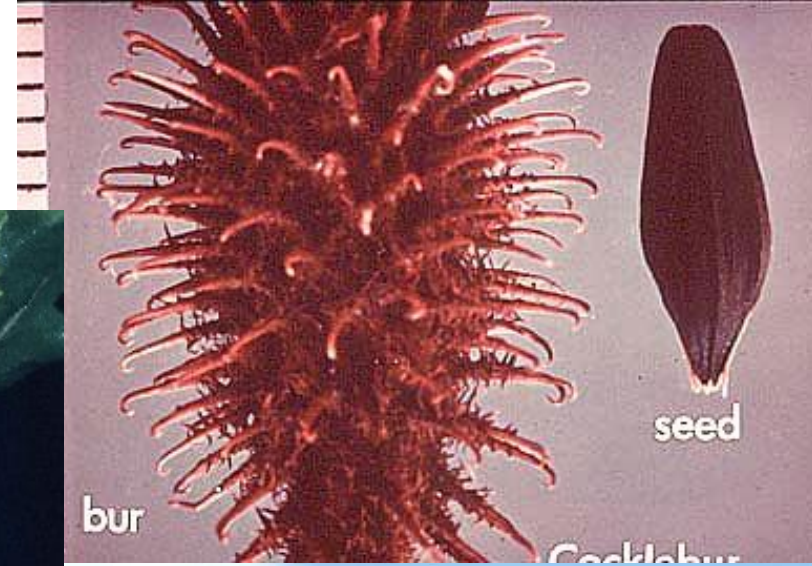
Cocklebur

Xanthium strumarium

- Annual broadleaf
- Toxin is hydroquinone; causes loss of appetite depression, incoordination, twitching, paralysis
- Especially a problem in spring at 2-cotyledon stage or seeds
- Cultivated fields and pastures; esp. sandy soils



Cocklebur



Cocklebur



Jimsonweed

Datura spp.

- Annual Broadleaf
- Toxin
 - Alkaloid
 - atropine, scopolamine, and hyoscyamine
- Parts: flowers, leaves, seeds
- Affects: cattle, humans, horses, goats, sheep
 - Rapid breathing, nervousness, convulsions



Jimsonweed

- Leaves irregularly shaped; lobes with wavy margins and pointed tips
- Stems hollow and purplish



Jimsonweed

- Common around feedlots, barnyards, cultivated fields, roadsides, disturbed habitats
- Foul smelling annual; fruit is prickly capsule
- All plant parts, especially seeds are toxic
- Poisoning usually occurs when ingested in hay or seeds mixed in grain



Jimsonweed

- Flowers white and tubular (moonflowers)
- Fruit with blunt spines, golf ball sized with many seeds

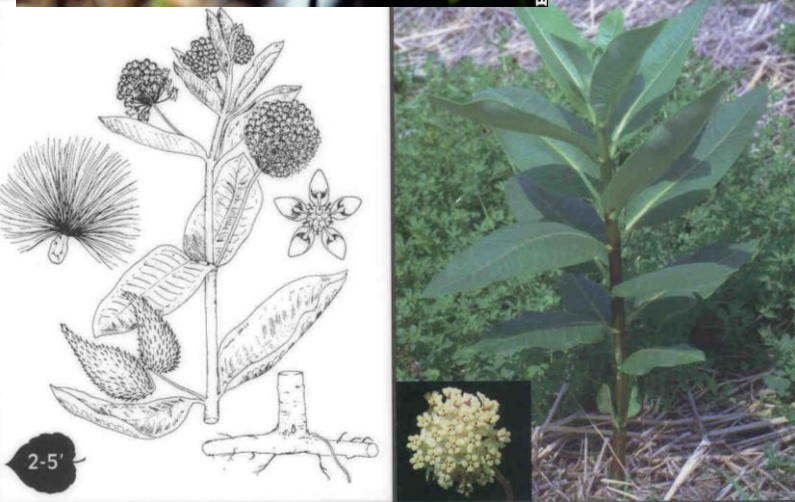


Milkweed (multiple species)

(Asclepias species)

- Warm season, perennial broadleaf
- Rhizomatous tap root
- latex sap
- Toxin
 - cardenolides, glycosides, resinoids
- Symptoms
 - Abdominal pain
 - Colic
 - bloat
 - diarrhea due to gastroenteritis.
 - Muscle tremors, weakness and recumbency

Milkweeds remain toxic when dry.



Milkweeds (*Asclepias* spp.)

- Found in dry areas, waste places, roadsides, stream beds
- Most dangerous in spring
- All parts of plant green or dry are poisonous



Whorled milkweed

Asclepias verticillata

- One of the most toxic of milkweeds
- Emerging problem in pastures
- Largest problem is inability of animals to avoid it in hay
- Where does it come from?
 - Ditches
 - Hay??



Whorled milkweed

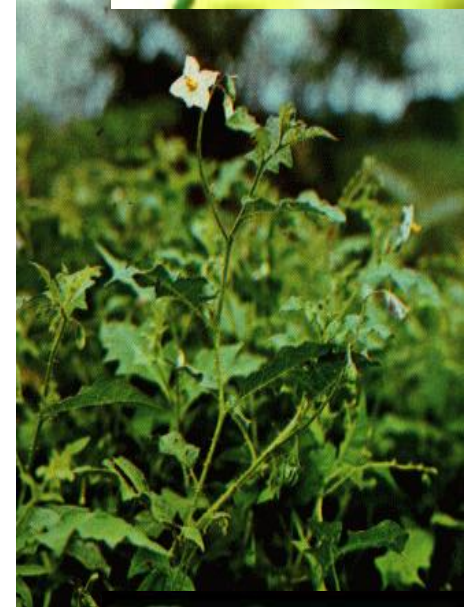
- Native, creeping perennial
- Found in sandy soils
- Extremely hard to control – inconspicuous in forages
 - High rates of 2,4-D + dicamba



Nightshade family

(*Solanum sp.*)

- Warm Season perennial broadleaf
- Distinctive flower
 - 5 sided tomato type
 - groups of 3-7
- Toxin
 - Solanine Alkaloid
- Parts: leaves, immature fruit
- Affects: cattle, humans, rodents, sheep, horses, goats
 - Nausea, vomiting, diarrhea, respiratory paralysis
- Horse
 - Excess salivation, Colic, Diarrhea, muscle tremors, weakness



Poison Hemlock

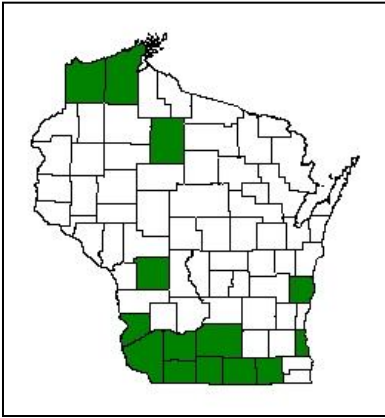
Conium maculatum

- Biennial
- All plant parts poisonous; especially seeds
- Toxin is an alkaloid, 0.25-0.3% bodyweight lethal
- Symptoms:
 - Weakness, pupil dilation, slowed heart rate, coma, death
- Found on roadsides, edges of fields and waste areas where soil is moist; distinctive purple blotches on stem



Poison hemlock

(*Conium maculatum*)



Red Maple

(*Acer rubrum*)



bio.bd.psu.edu/plant_web/Aceraceae/Red_Maple_Leaf.html



www.bio.brandeis.edu



- Tree is 40-50 feet tall
 - **Bark smooth and grey, darkening and furrowed in narrow ridges with age.**
 - **Twigs stout and shiny red to grayish brown.**
- Toxin
 - unknown (oxidant?)
 - Leaves, especially when fallen, damaged, or wilted.
- Horses only
 - Breathing difficulties
 - Jaundice
 - dark brown urine
 - death

White snakeroot

Eupatorium rugosum

- Perennial found in shady, moist woodlands and wood edges; member of sunflower family
- Toxic compound is tremetol, peak concentrations in summer through fall
- Tremetol is fat soluble; becomes concentrated in milk of lactating animals
- Causes trembling in legs, sweating and labored breathing



Spotted Water Hemlock

Cicuta maculata

- Perennial ; found in wet areas
- Toxin is cicutoxin; yellow oil in plant is most poisonous, smells like parsley
- Symptoms include salivation, muscle twitching, seizures
- Mature leaves and stems lose some toxicity



Yew

Taxus spp.

- Evergreen shrub with needles about 1 inch long
- Not a pasture problem but the most common plant poisoning from clippings fed to livestock or animals browsing on shrubs
- Causes cardiac failure
 - Foliage, bark, seeds are all toxic



Black Locust

(*Robinia pseudoacacia*, *R. neomexicana*)



Tree up to 70 feet in height.

- Leaves are alternate, pinnate in 3-10 pairs.
- Drooping clusters of perfumed, white or pink
- Fruits are straight, flat, many brown pods

- Toxin

- Bark, leaves and seeds
 - highest levels of Robin, a lectin (glycoprotein)
- Affect: horse, cattle, human, poultry, sheep, goat
 - Rapid heartbeat, diarrhea, cardiac failure



Bracken Fern

Pteridium spp.

- Found in full sun, partial shade, woods, old pastures, thickets; indicator of poor soil
- Poisoning symptoms appear 2-4 weeks after continuous grazing; acute poisoning related to vitamin B1 deficiency.
- Leaves and rhizomes are toxic



Hoary Alyssum

Berteroa incana

- Annual
- Toxin: unknown, primarily affects horses
- Symptoms: lameness, stiffness, limb swelling, fever, diarrhea, abortion
- Common in pastures, small grain fields and roadsides; mustard family



Horsenettle

Solanum carolinense

- Perennial
- Toxins are alkaloids, including solanine; unripe fruits are most toxic
- Symptoms include depression, decreased heart and respiratory rate, muscle weakness, paralysis of hind legs



Horsetail (*Equisetum* spp)

- Found in wet or dry areas of pastures and roadsides; all parts of plant toxic
- Two distinct growth forms
- Toxic component is thiaminase; most problems in hay
- Very tolerant to herbicides



Oaks/Acorns

Quercus spp.

- Found in most deciduous woods, native
- Young leaves, acorn buds, green acorns most toxic
- Toxic agent is gallotannins; cause a loss of appetite, constipation, black pelleted feces
- Sheep and cattle most commonly affected



Wild Cherry, Black Cherry, Choke Cherry

Prunus spp

Tree/ bush - 3- 9 feet tall

- Ripe fruit dull black, only slightly fleshy.

Toxin: hydrocyanic acid (also called prussic acid)

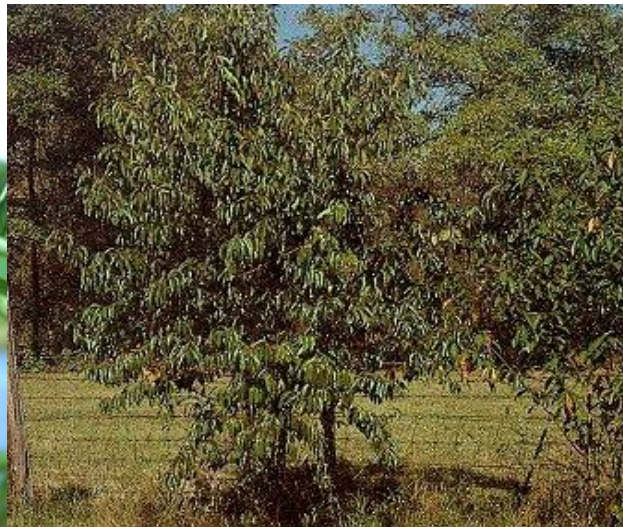
- primarily in fallen, wilted leaves trees, seeds

Affects: horses, cattle, moose, sheep, swine, goats

-difficult breathing, bloat, moaning, staggering, recumbency and convulsions before death.

- Animals may die within one hour after eating leaves.

-Mucous membranes are bright red in color, as is the blood





Chokecherry

Buttercup or Crowfoot

Ranunculus spp.



- Cool season broadleaf
- Distinctive yellow flower
- Toxin
 - Alkaloid
 - Ranunculin (oily glycoside), is converted to protoanemonin by the action of plant enzymes released when the plant is chewed.
- Dried plants lose toxicity
- Affects: cattle, goats, horses
- Horse
 - Excessive salivation
 - reddening of oral mucous membranes
 - diarrhea



St. John's Wort (Klamath weed)

Hypericum perforatum

- Found in old meadows, pastures, roadsides, waste areas
- Leaves have large stomata that appear as small holes when held up to the light; 5-petaled flowers
- Leaves and flowers contain hypericin – causes photosensitization on white or light colored skin
- Properties persist in hay
- Recently sheared sheep esp. susceptible



Sweet Clover

Melilotus officinalis, *M. alba*



- Mainly an issue when moldy or spoiled hay with large % of sweet clover is consumed
- Fungi (*Aspergillus* spp.) grows on clover, converts coumarin to dicoumarol.
 - interferes with prothrombin and vitamin K dependent coagulation factors.
- Minor losses in sheep

Wild parsnip

Pastinaca sativa

- Biennial
- Toxin: furanocoumarin
- Animals affected: horses and cattle
- Symptoms: severe photosensitivity
- Most palatable prior to flowering; large doses necessary for poisoning



Pigweed

Amaranthus spp.

- Annual
- Toxin: Protoanemonin
- Species: cattle, pigs, sheep horses
- May cause kidney damage, weakness, muscular tremors, staggering gait, abortion
- Dose dependent on nitrate level. Commonly associated with plants that uptake nitrate from fertilizers or treated with herbicides. Stems most poisonous



Photo by:
Richard Old
www.xidservices.com

Curly Dock

(*Rumex crispus*)



Curly Dock (*Rumex crispus* L.)



M. Williams 1995

- Toxic levels of oxalate
 - leaves
- Affects: horse cattle, sheep
 - Muscle tremors, tetany, death
- Horse:
 - Muscle tremors
 - Tetany
 - Weakness
 - Reluctance to move
 - Depression
 - Recumbency result from hypocalcemia.

Box Elder trees/seeds

- Seasonal pasture myopathy in horses caused by ingestion of box elder seeds in the fall
- Previously thought to be white snakeroot toxicity
- Toxic to sheep and other ruminants??



Forage species with potential problems

- Alsike clover
- Sweet clover
- Endophyte infected tall fescue
- Sorghum/Sudangrass/hybrids/Johnsongrass
- Switchgrass
- Goose grass
- Foxtail millet

Other concerns

- Ergot
- Plants with burs, sharp awns
 - These are an issue both for wool quality, eye health, and trauma when ingested

When should I worry about poisonous plants?

- First grazing in the spring
 - poisonous plant more palatable and other forage not available
- Limited desirable forage available
 - When animals are hungry, their selectivity decreases
- After an herbicide application
 - Palatability can increase after weeds are treated with a herbicide
- After application of N
 - nitrate accumulating plants (pigweed spp, common lamb's-quarter, common ragweed) can become toxic
 - Limiting uptake if feed is > 20% of these weeds

References

Plants Poisonous or Harmful to Horses in the North Central United States, Martinson, Howda, and Murphy, University of Minnesota Extension Publication 08491

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www.rce.rutgers.edu/harmfulplants/default.asp

Cornell University Poisonous Plants Database
<http://www.ansci.corness.edu/plants.comlist.html>

Colorado State University Guide to Poisonous Plants
http://www.vth.colostate.edu/poisonous_plants/

Purdue Toxic Plants by Degree of Toxicity
<http://www.vet.purdue.edu/toxic/cover1.html>

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- A Guide to Plant Poisoning of Animals in North America – A. P. Knight and R. G. Walter
- Poisonous Plants of Pennsylvania – R. J. Hill and D. Folland
- Poisonous Plants of the Central US – H. A. Stephens
(<http://www.kansaspress.ku.edu/order.html>)
- Pasture Plants Toxic to Livestock in Michigan – Alice Marczewski
- Guide to Toxic Plants in Forages – Glenn Nice, Purdue University Extension

Questions?

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