Missouri Valley Master Gardeners

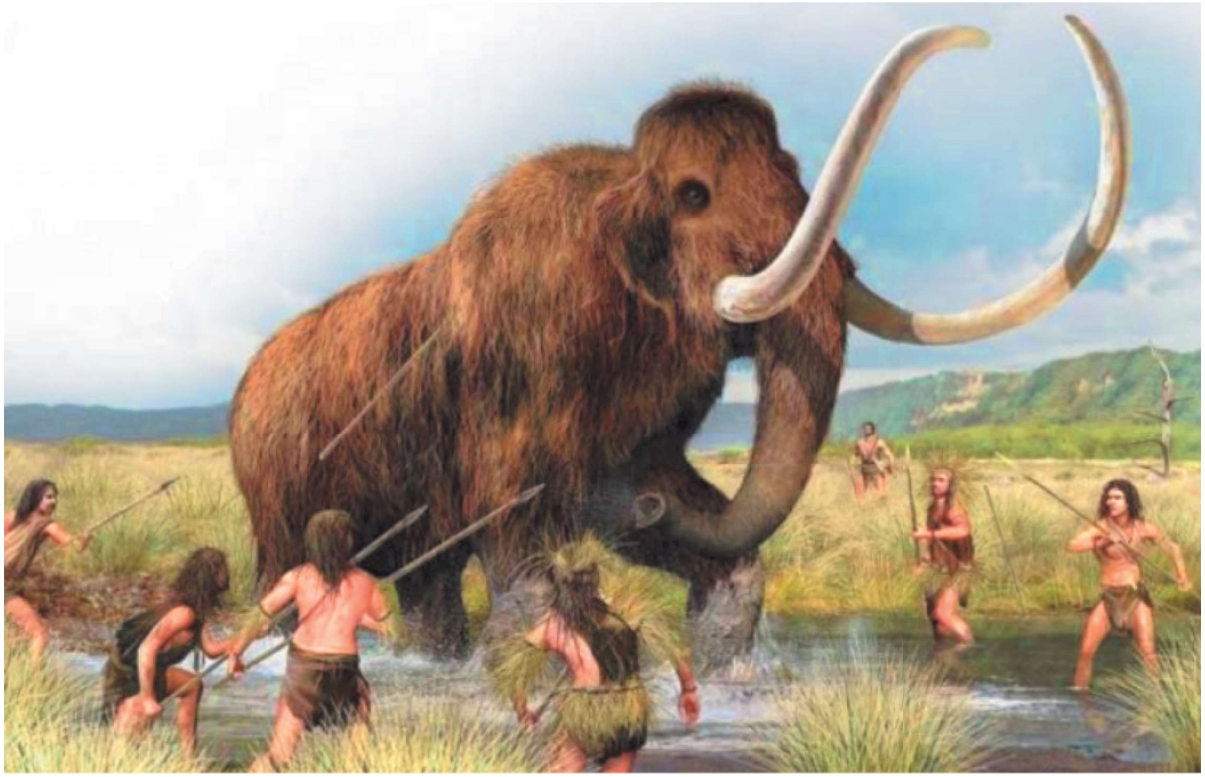
Dan Johnson

Invasive Species

This information is prepared and/or presented by an SDSU Extension Master Gardener volunteer.

South Dakota State University Extension
Master Gardener

What is an invasive species?



Any species that significantly modifies or disrupts the ecosystem it colonizes.

Native Invasion

Eastern Red Cedar

Non-Native Invasion

Kudzu

Introduced Invasive vs. Non-Invasive Plants

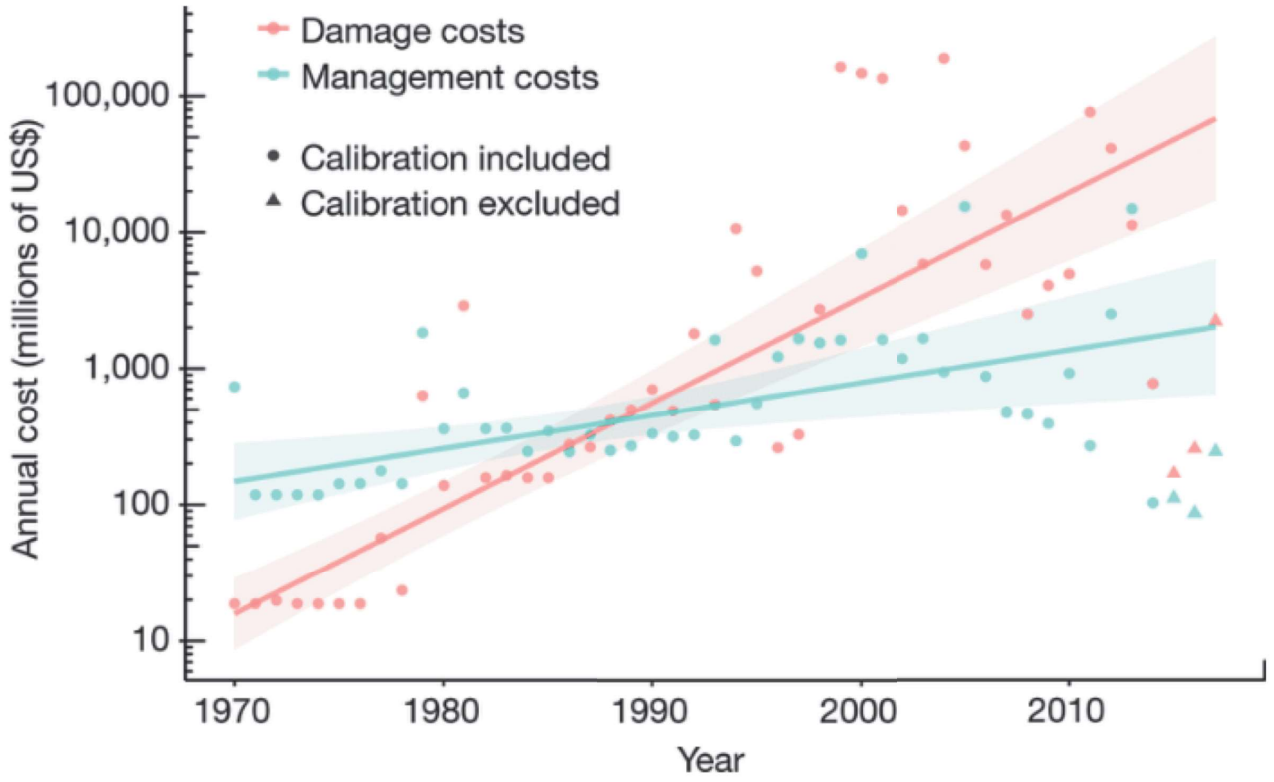
- Most introduced species are not invasive and may be economically important (wheat, soybeans, tulips)
- Tens of thousands of species introduced since European colonization began
- 5,000 naturalized introduced plants (the survivors)
- 10% rule= 10% survive, of those, 10% invade= 1% of introduced plants will invade

Why Should I Care?

Impact on Agriculture

- Direct pesticide costs for control
- Decreased crop and livestock productivity
- Render pastures unpalatable
- Create occupational hazards working with potentially dangerous chemicals that are used for control
- Far-reaching effects of chemicals on soil health, ecosystems, and people

Damage Costs and Management Costs-$$$$$



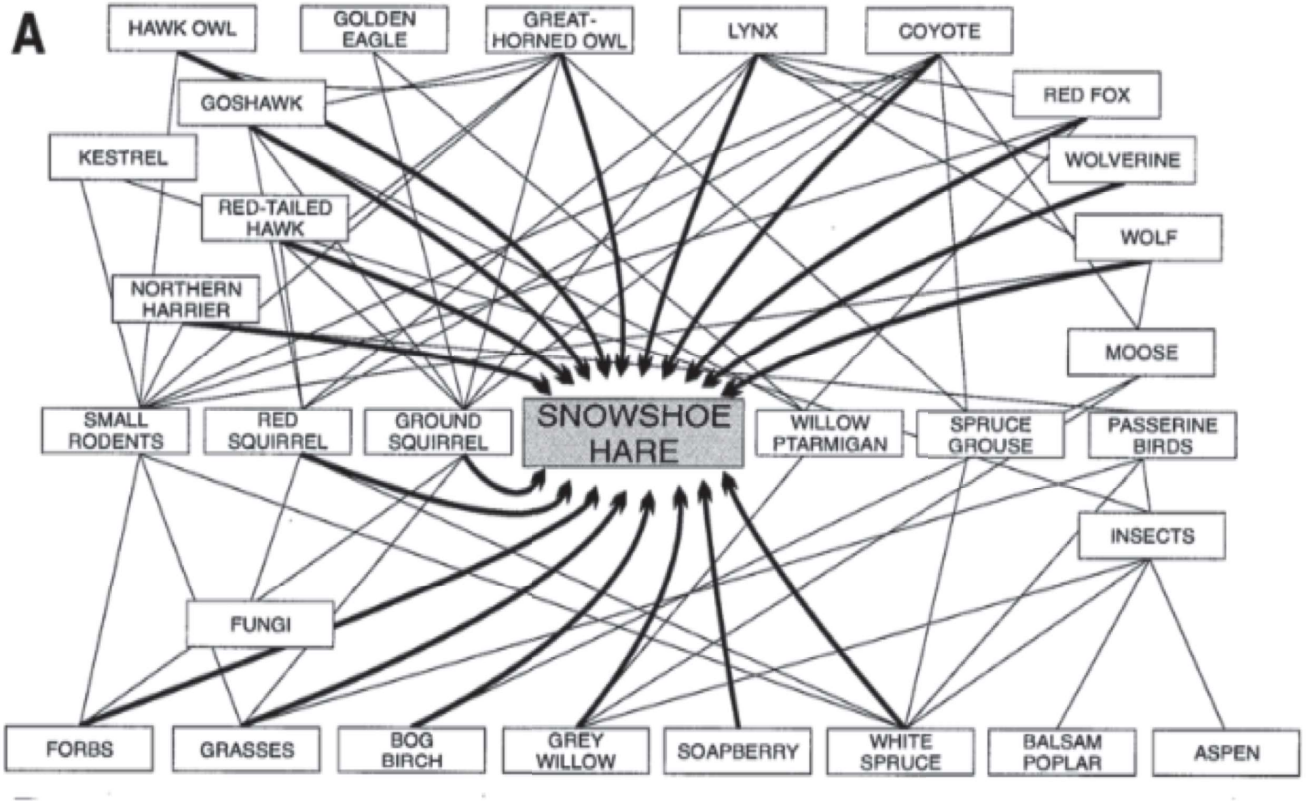
The Ecosystem is incredibly complex

Abiotic (Non-living)

- Water
- Light/radiation
- Temperature
- Climate
- Minerals/Substrate

Biotic (Living)

- Plants
- Animals
- Microorganisms



Characteristics of Invasive Plant Species

Seed germination strategies

Large #'s of seeds, wide range of temperatures, dormancy, spread by birds, fur, wind, and water

Allelopathy

Poison your neighbors

Aggressive roots

Spread long distances, go deep into soil, smother surrounding roots

Phenotype Plasticity

Highly adaptable to multiple conditions with no change in the genes

Competition with Native Species

- Invasives may have fewer factors (insects, climate, diseases, etc.) controlling their populations.
- This may give an advantage to invasives over natives leading to decreased diversity and local extinction.
- 400 of the 958 threatened and endangered species are negatively impacted by non-native invasive species.

YANKTON COUNTY PROPERTY OWNERS

Noxious Weed MUST be Controlled

Per SDCL 38:22, Landowners are Required to Control Noxious Weeds on their Property.

Yankton County Weed Department will begin inspections on May 1, 2022.

Infested lands not controlled will be put on enforcement.

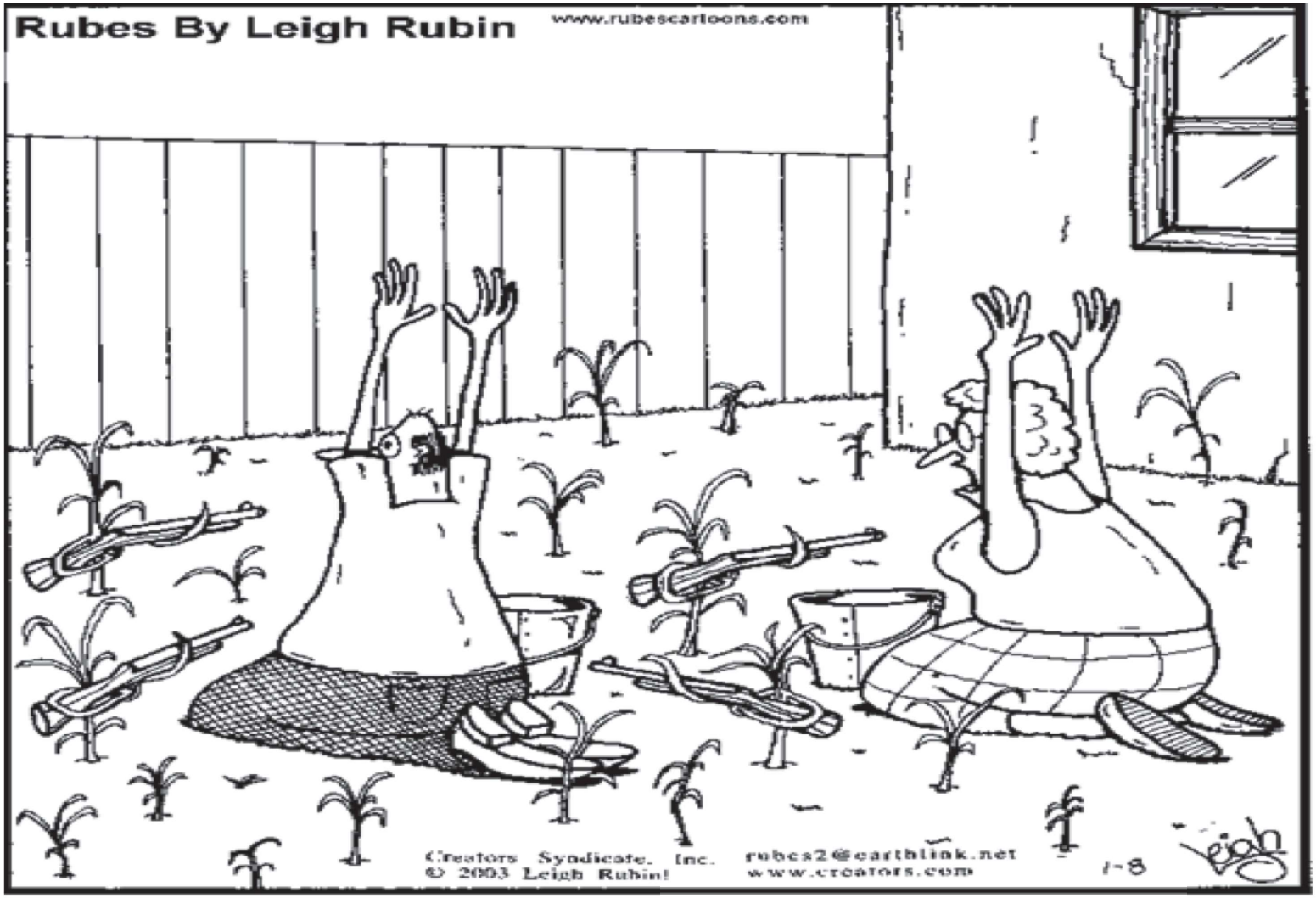
Possible Noxious Weed Sites

- Fence Lines & Roadsides
- Pastures
- Vacant Lots & Unused Areas
- Around Lakes, Streams & Dry Streams
- CRP Ground
- Windbreaks & Tree Plantings
- Field Borders
- Fields that were too wet to plant last year

Noxious Weeds

- Leafy Spurge
- Canada Thistle
- Perennial Sow Thistle
- Hoary Cress
- Purple Loosestrife
- Absinth Wormwood
- Salt Cedar
- Musk Thistle
- Plumeless Thistle
- Field Bindweed
- Common Mullein

For more information, visit our page at www.co.yankton.sd.us/custom/weed, call 605-260-4473 or visit our office at 3302 W City Limits, Yankton, SD 57078.



"We never should have waited this long ...
Now the weeds have *completely*
taken over."

Yankton's Noxious Weeds: Mullein

- Illegal fishing (Rotenone)
- Seeds can be dormant for decades
- Disturbed ground
- Biennial
- 1st year rosettes
- 2nd year 3-7 foot tall

Common mullein

Verbascum Thapsus

Weed:	Local noxious. Biennial.
Leaves:	6- to 18-inches long, densely wooly. Pale yellow-green.
Stems:	3- to 7-feet tall, stout, seldom branched, covered with wooly hair.
Flowers:	5-lobed, sulfur yellow. About 1-inch across in dense spikes.
Roots:	Branched taproot. Forms rosette first season.
Sites:	Range, pastures, and roadsides.
Notes:	Most common in southwestern South Dakota.

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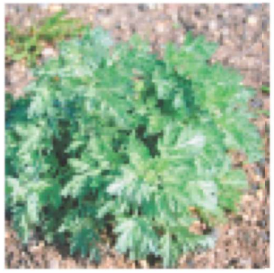
Yankton's Noxious Weeds:
Absinth Wormwood

The Trouble with Absinthe

When temperance advocates won the ban on absinthe in 1915, many of them saw it as the first step in a broader anti-drinking campaign.

- Bohemian artists in Paris' "Green Muse or Green Fairy"
- Absinthe murders in Switzerland 1905
- Thujone is a convulsant
- Absinthe ban lifted EU 1998, USA 2007 but strict control on thujone levels



Absinth wormwood

Artemisia absinthium

Weed:	Local noxious. Perennial.
Leaves:	2- to 5-inches long, alternate. Lower leaves deeply divided. Upper leaves linear and less divided. Gray-green.
Stems:	2- to 4-feet tall, heavily branched. Covered with gray hairs, giving grayish-green cast. Distinct sage fragrance.
Flowers:	Small, yellow, compact, short-stalked.
Roots:	Extremely heavy, fibrous root. Perennial crown areas with buds.
Sites:	Pastures, trees, and roadsides. Primarily east of Missouri River.
Notes:	Also called "wormwood sage". Aggressive. Control plants in fall (Sept.-Oct.) or spring (May-June) when less than

Yankton's Noxious Weeds:
Purple Loosestrife

- Wetland Habitats
- Missouri River
- Lake Lewis and Clark
- Aquatic Herbicides
- Drones

Purple loosestrife

Lythrum salicaria

Weed:	Noxious statewide. Creeping perennial.
Leaves:	Opposite, linear, smooth margins, no petiole.
Stems:	4- to 8-feet tall. Stiff, woody with 4 to 6 sides. Older plants are heavily branched.
Flowers:	Purple-magenta, 5- to 6-petalled. Arranged in long spikes.
Roots:	Very heavy root, new branches from base.
Sites:	Serious invader in marshes, along streams and in wetlands. Limited to "wild" infestations.
Notes:	Seed develops in floating capsules.

Yankton's Noxious Weeds:

Field Bindweed

- It's everywhere!
- 50% decrease in Ag production
- In the top-10-worst weeds in the world
- 60 year-old seed bank
- Deep roots- 30 feet!
- A long term project to eradicate
- Easier to prevent than treat

Field bindweed

Convolvulus arvensis

Weed:	Local noxious. Creeping perennial.
Leaves:	Arrowhead-shaped, usually rounded tip. Spreading basal lobes.
Stems:	Smooth, 2- to 7-feet long. Spreads over the ground.
Flowers:	White or pink, funnel-shaped. About 1-inch. Two finger-like bracts below flower.
Roots:	20- to 30-feet deep. Extensive, spreading.
Sites:	Cultivated fields, pastures, range, trees, roadsides, home grounds. Adapted to dry conditions.
Notes:	Most widespread noxious weed in South Dakota. Requires 2- to 4-year control plan.

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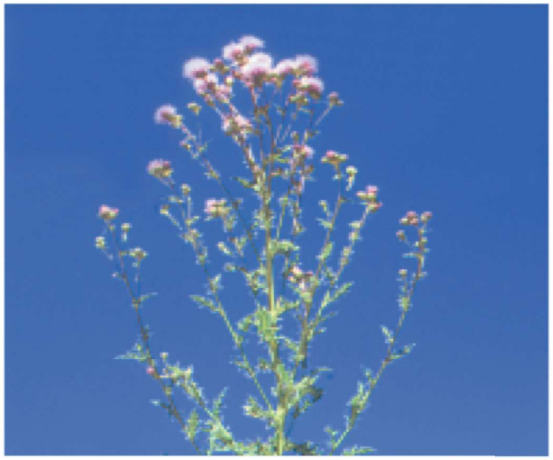
Yankton's Noxious Weeds: Canada Thistle

- Spreads rapidly in pastures
- Prolific seeder
- Small thistles
- Grows vegetatively (from roots) and by seeds
- 20 year seed bank
- Disturbed soils
- Fluctuating water levels- streambanks, wet meadows



Canada Thistle

Cirsium arvense

Weed:	Noxious statewide. Creeping perennial.
Leaves:	Smooth, medium green, spine-tipped, crinkled margin. Smaller than biennial thistle.
Stem:	2- to 5-feet tall, grooved, branching at top.
Flowers:	Numerous flowers on branched heads. About .75-inch. Usually lavender, may be pink or white. Separate male and female flowers.
Root:	10- to 15-feet deep.
Site:	Grows statewide. Common in pasture and range; also grows in trees and cultivated fields.
Note:	Difficult to control.

Yankton's Noxious Weeds: Salt Cedar

- Aka-Tamarisk
- Late 1800's- ornamental
- 200 gallons/day/plant
- Increases salt content of soil preventing native plant growth
- Incredibly hard to kill

Saltcedar

Tamarix spp.

Weed:	Noxious statewide. Perennial shrub or tree.
Leaves:	Alternate, cedar-like on slender, branched green stems.
Stems:	Smooth, woody, dark brown to reddish-brown
Flowers:	White to deep pink. 5-petaled. Formed in finger-like clusters in mid to late summer.
Roots:	Deep, extensive taproot.
Sites:	Flood plains along rivers, lakes, and ornamental plantings.
Notes:	Excessive water consumer; depletes surface water. Very invasive. Spreads from seed or stem fragments.

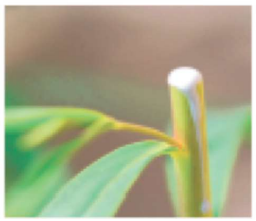
Yankton's Noxious Weeds: Leafy Spurge

- Tolerates many conditions
- Found in disturbed soils
- Aggressive spread especially in dry conditions
- Milky sap is toxic to livestock
- Flea beetle provides some biologic control

Leafy Spurge

Euphorbia esula

Weed:	Noxious statewide. Creeping perennial.
Leaves:	Alternate, long, narrow, drooping, dark green.
Stems:	2- to 3-feet tall. Plant contains milky sap.
Flowers:	Small green flowers surrounded by yellow-green bracts. Seed explodes from a 3-celled capsule.
Roots:	Dark brown with pink buds. May reach 20-feet deep.
Site:	Grows in all cultivated crops, pastures, range, trees, and wetlands.
Notes:	Capable of rapid spread. Seed matures 7 to 10 days after first flower color.



Yankton's Noxious Weeds: Hoary Cress

- "Whitetop" can look like a field of snow
- Disturbed alkaline soils
- Not common here but very hard to eradicate once established

Hoary Cress
(Cardaria draba)

Roots: Extensive, creeping, branched above.
Stems: Up to 2 feet tall, erect, stout.
Leaves: Oblong, alternate, margins wavy and shallowly toothed.
Seed: Rough, reddish-brown, in heart shaped bladder-like capsules, abundant.
Flowers: White, 4 petals, margins toothed to entire.
Origin: Eurasia
Poisoning: Mucous membrane irritant.

Yankton's Noxious Weeds: Musk Thistle

- Rosettes 1st year
- Bolt the 2nd year (usually)
- Seeds can still germinate from herbicide-treated plants already in bloom
- Rapidly spreading in pastures
- Up to 6 foot tall
- Disturbed areas

Musk Thistle
(Carduus nutans)

Roots: taproot, fleshy, stout
Stems: erect, highly branched, with spiny wings
Leaves: alternate, blades simple, margins deeply serrate, surfaces without hair
Flowers: rose-purple to white disk florets, developing from outer edge to center
Origin: Eurasia

Yankton's Noxious Weeds:
Plumeless Thistle

- Disturbed areas
- Biennial growth (Usually)
- Pollinator Food- a dilemma

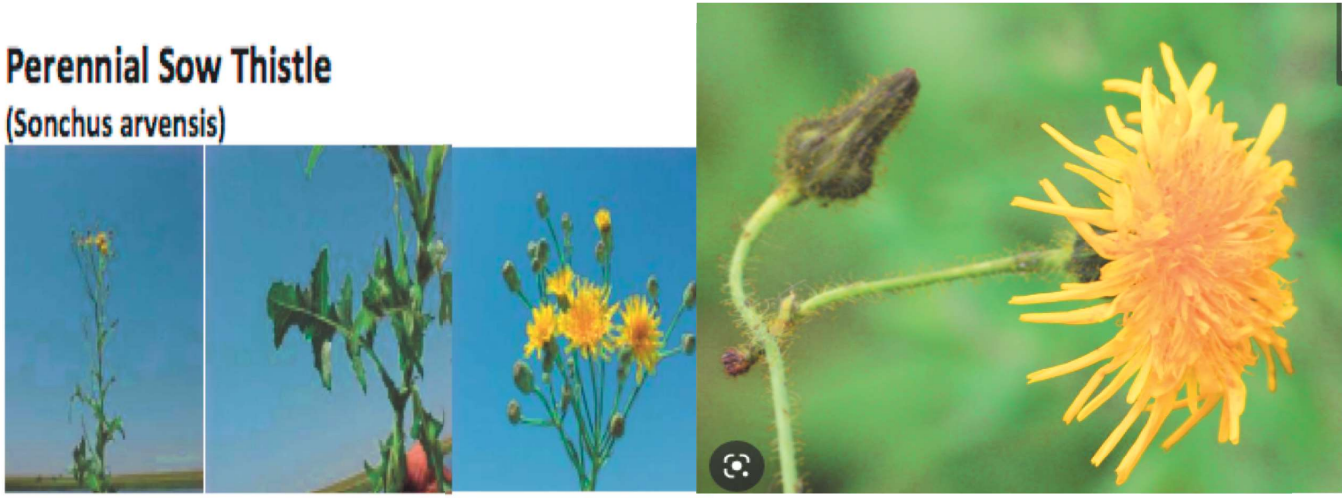
Spiny plumeless thistle has leaf-like spines that extend up to the flower head and spiny bracts under the flowers.

Yankton's Noxious Weeds: Sow Thistle

- Reduces crop yields
- Dandelion-like flowers
- Flowers close at noon
- Up to 5 feet tall

Perennial Sow Thistle

(Sonchus arvensis)



Roots: Extensive, may penetrate soil five to ten feet deep, new plants produced by small root pieces.

Stems: Milky sap throughout the plant, erect, 2-5 feet tall.

Leaves: Deeply lobed to nearly entire, clasping base, mildly prickly margins but lack spines on the lower midrib.

Seed: Tufted, spread by wind.

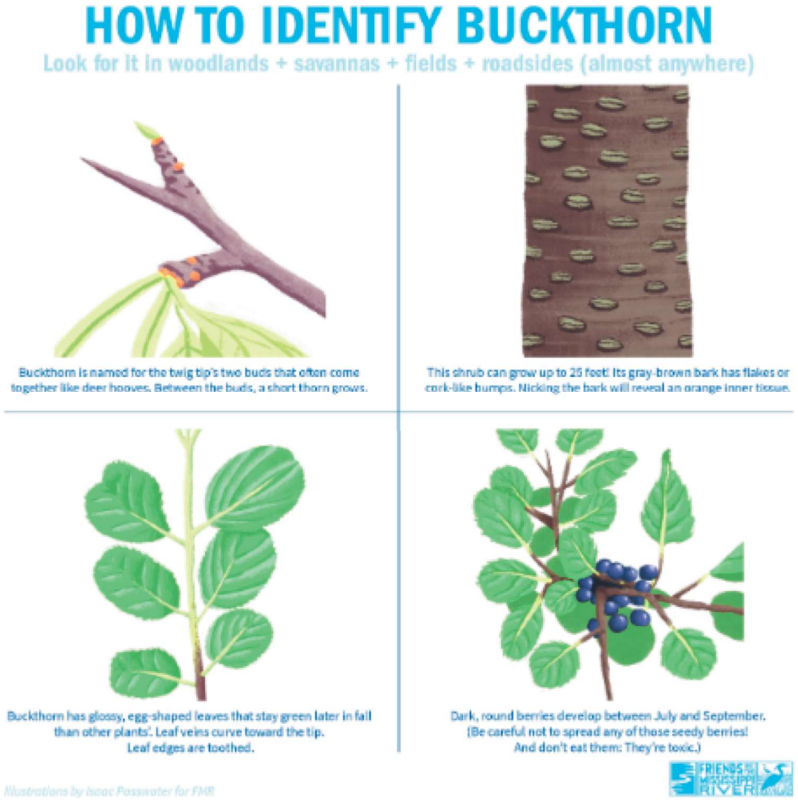
Flowers: Yellow, up to 2 inches wide with flower stalks and flower base (bracts) covered with gland tipped hairs.

Origin: Eurasia or Europe

Poisoning: Unknown

Common Buckthorn

Rhamnus cathartica



Common Buckthorn

Bark with many horizontal ridges called lenticles

Common Buckthorn

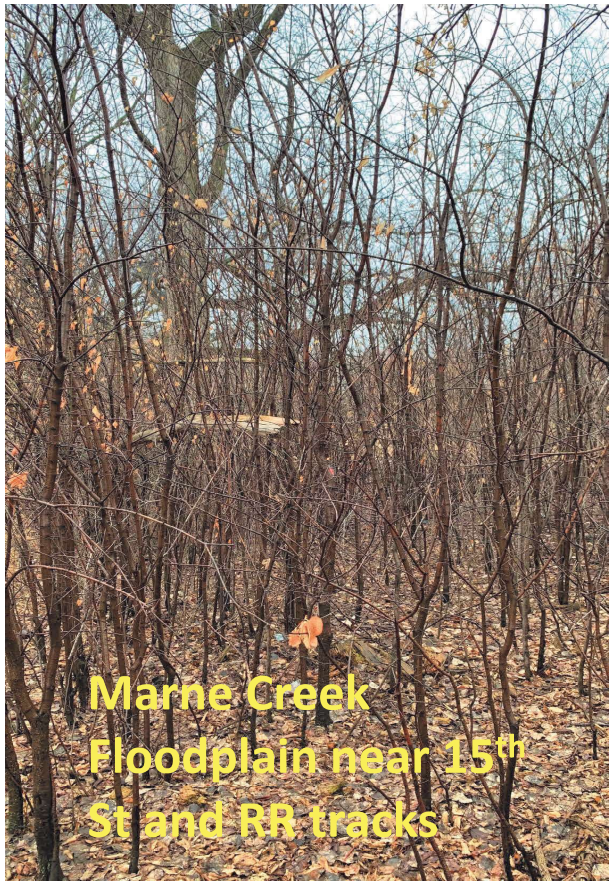
The inner bark is a bright yellow-orange

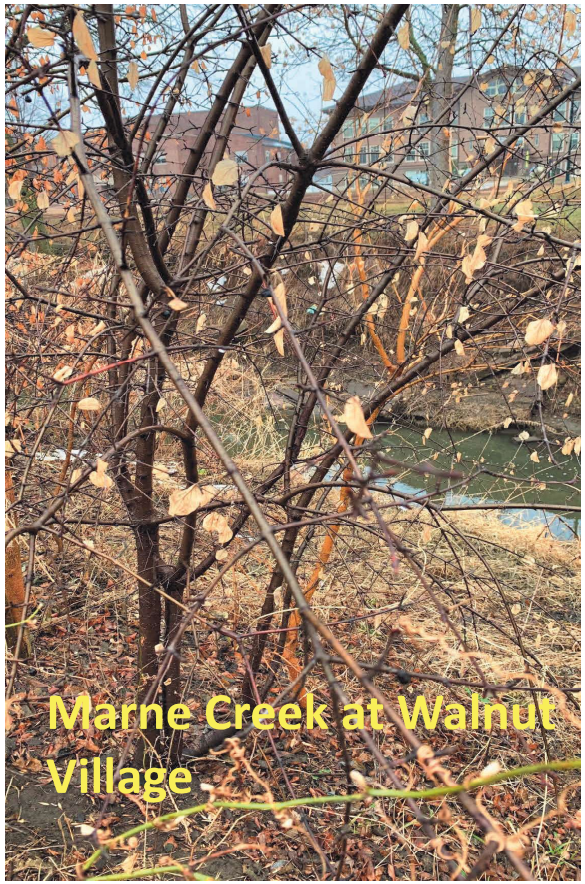
Common (or European) Buckthorn

- Seeds eaten by birds and mice
- Laxative effect
- Fast germination
- A long growing season
- Avoided by insects and deer
- Vigorously re-sprout when mowed or cut down
- Rapidly form dense thickets with understory canopy blocking most sunlight from other plants
- A monoculture results

Common Buckthorn: Lewis and Clark Rec Area

Common Buckthorn in Yankton





Common Buckthorn

- Are dioecious
- Only female plants have berries/fruit
- ID is easy in the late autumn-about the last tree to drop leaves
- Extra photosynthesis =extra growth=extra competition

Buckthorn Management: Pulling

- By hand up to 1/2inch diameter
- Depends on Soil
- After rain
- Before fruiting
- Replace soil
- Mechanical assist with Weed Wrench or Extractigator < 2”
- When infestation is small

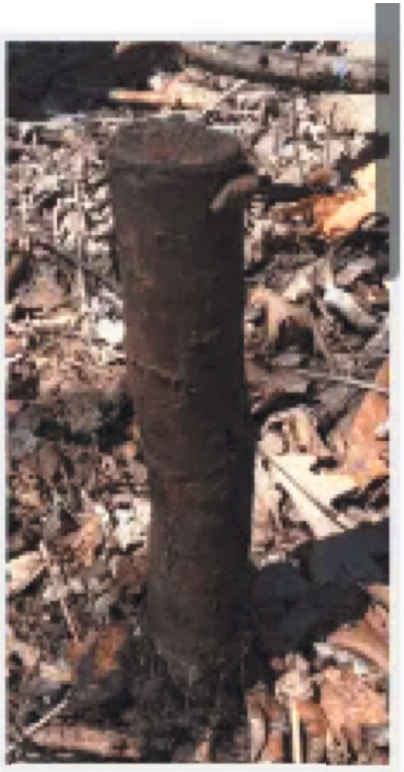
Buckthorn Management


Manually removing Buckthorn

Cutting alone is not enough

MAKE SURE YOU TREAT AFTER YOU CUT! Untreated stumps sprout back very vigorously the next year (see below).

Non-chemical removal after cutting Buckthorn




Proper disposal of Buckthorn


Buckthorn Seedlings


Buckthorn roots

Common Buckthorn Control

- Burning-mixed results
- Underplanting
- In wetlands-restore water levels
- Swiss biological control research-disappointing because non-specificity of insects to the host plant and little damage by insects.
- Fungus carried by seed-feeding midge???

Chemical application after cutting Buckthorn

- Always add a dye to the herbicide
- Only the cambium needs treated
- Cut so stump is level

Chemical control of Buckthorn

1. **Stump Application**

   Cut close to ground and level, add dye, apply to cambium

2. **Basal Bark Application**

   Stronger concentrations needed. Slow death. Seed spread before dead?

3. **Frilling**

   Cut a gash , apply herbicide in gash to kill quicker

Herbicide for Buckthorn

Table 1. Sample of Chemical Trials that Successfully Controlled Buckthorn

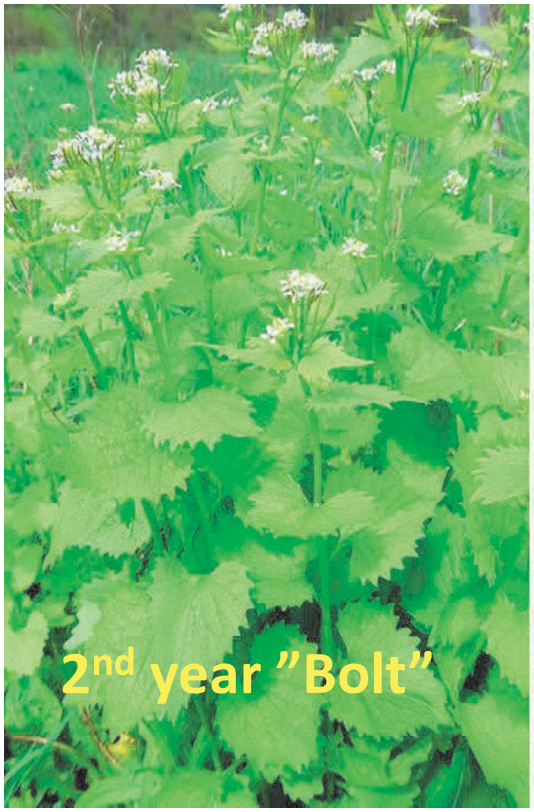
Method	Chemical	Timing
Cut Stump Application	20 - 25% glyphosate (diluted in water)	August or September
	10% glyphosate	August
	12.5% tricolopyr (form for oil dilution)	Summer or winter
	Garlon 4 (1:3 of Garlon 4:oil/diluent)	
	4% ester with diesel	
	AMS, aqueous concentrated	Year round
	25% Picloram + 75% 2,4-D	Summer
Frilling	25% Picloram + 75% 2,4-D	Growing season
	Garlon 4	
Basal Bark Application	2-4% ester 2,4-D in diesel fuel	Early summer
	12.5% 2,4-D	
	2.5–3% glyphosate	May to June
	10-20% Garlon in diesel fuel	Fall
Foliar	4% fosamine	Actively growing
	Glyphosate (e.g. Roundup)	Actively growing

Note: Some trade name chemicals are not available in Canada

Garlic Mustard

Alliaria petiolata

Garlic Mustard



Garlic Mustard

- Introduced mid 1800's
- Native to Europe and Asia
- Food, herbal and medicinal qualities, erosion control
- Can outcompete understory native plants > affects insects, etc.
- Shade out new trees
- Release chemicals from roots> decrease rhizomal networks>less nutrients for natives

Garlic Mustard

- Seasonal creek bed at L&C State Recreation Area
- Temperature tolerant germination
- Early photosynthesis
- Significant growth advantage over native species

Garlic Mustard Prevention and Management

- Clean boots, bike tires, horse hooves
- Pulling is effective for small areas
- Won’t regrow from taproot
- Pull before seeds form

Be on the look out for the “Tree of Heaven”

Tree-of-heaven (Ailanthus altissima). Photo: Richard Gardner, Bugwood.org

- Identified in Vermillion
- Look-a-likes are sumac and walnut (compound leaves)
- Smells like rotten peanut butter


iNaturalist
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Curbing the Spread of Invasive Plants

1. **Plant more native plants and remove invasive plants**

   Helps to support a robust and resilient ecosystem

2. **Learn to identify invasive species in your area**

   Report sightings to your County Extension
   Become familiar with an identification app like iNaturalist

3. **Prevent introduction of invasives with best practices**

   Buy new plants from trusted sources
   Be careful where topsoil, manure, hay, etc. comes from, then monitor

Curbing the Spread of Invasive Plants

4

Move rapidly to eradicate newly detected invaders

It is much easier to only have to deal with a small invasion

5

Clean your tools, foot wear, gear, boat, tires, animals

When traveling between areas, parks, trails, gardens, countries

Invasive Plant Species Resources

- South Dakota State University Extension
- USDA Forest Service
- Nature Conservancy
- University of Minnesota Extension


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Missouri Valley Master Gardeners

Thank You!

This information is prepared and/or presented by an SDSU Extension Master Gardener volunteer.

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