



The Weed Watch

A publication of the Panhandle Research Integration for Discovery Education Weed Management Area in conjunction with Middle Niobrara Weed Awareness Group and High Plains, Sandhills, West Central, Platte Valley and Twin Valley Weed Management Areas

Fall 2013 Newsletter

Weeds Won't Wait

Leslie Stewart-Phelps, U.S. Forest Service and PRIDE Board Member

Wildfires hit many areas of Nebraska hard in recent years. The ground was greatly disturbed during and after these fires because of the heat and flames, the equipment used by firefighters within the fire area, and the vehicular traffic outside the fire zone. This soil disturbance provided the perfect environment for weeds to become established by opening the canopy, reducing competition, and exposing bare mineral soil. Often, the weeds that come in after fires are of the worst sort. They are highly competitive against native vegetation, they spread rapidly, they displace desirable vegetation, and they form dense populations. Four of these weeds have been most noticeable after our recent fires: Canada thistle, common mullein, hoary cress, and houndstongue.

These four weeds are described in more detail below. They differ in many respects. Control methods may differ as well. However, some practices should be used for all weeds, especially after a fire, to reduce the ability of weeds to establish themselves and spread:

- Survey frequently and control small infestations.
- Prevent flowering and seed production.
- Exhaust the root systems by persistent follow-up treatments.
- If seeding is planned to re-establish desirable vegetation on bare ground, it should be done as soon as possible using only certified weed-free seed mixes.
- Prevent new infestations by cleaning all equipment, vehicles, clothing, pets, and livestock of mud, soil, plant parts, and seeds before going into the burned area.
- Small patches of undesirable weeds should be eradicated and larger patches should be controlled within and adjoining the burned area.
- Use herbicide at the stage of growth and in the season when it is most effective.
- Restrict grazing and disruptive activities until a healthy, desirable, perennial native plant community is established to provide competition.
- After healthy vegetation is established, minimize new soil disturbance and use proper grazing practices.

CANADA THISTLE

Canada thistle reproduces from seeds or roots, but its roots are its main source of reproduction. The main taproot grows until it reaches moisture, often up to 22 feet. Then lateral roots grow as much as 20 feet in one season. Seedlings develop the ability to reproduce from their root systems from 2 to 8 weeks after germination. Pieces of root as small as 0.2 inch can produce new plants. A colony begun by the root system of one plant may reach 115 feet in diameter. Each plant produces 1,000 to 1,500 seeds. Seeds can remain viable in the soil for over 20 years. They mature quickly and most are capable of germinating 8 to 11 days after the flowers open, even if the plants are cut when flowering.



Tillage is not a good method of control since it breaks up the roots and allows the pieces to form new plants. Mowing or cutting temporarily reduces aboveground biomass and can prevent flowering and seed production, but does not kill plants unless repeated at 7- to 28-day intervals for up to 4 years. Repeated and frequent pulling or hand cutting of individual plants will eventually starve underground stems. Cutting or pulling should be done at least three times each season, in June, August, and September.

Canada thistle may not establish itself immediately after logging and fire disturbances but may be delayed for several seasons. Fire kills the aboveground portion of plants, but the extensive and deep roots can survive severe fires. New shoots from the roots can show up a year after the top growth is destroyed in a fire. Canada thistle seedlings have been known to show up anywhere from 2 to 9 years after a fire.

COMMON MULLEIN

Common mullein is usually biennial. The first year is a rosette with taproot. The second year is a tall, flowering stalk. It has a deep taproot that can access deeper moisture. This gives it a competitive advantage. Mullein reproduces only by seeds that can live 100 years in the soil. Each plant can



have 100,000 to 200,000 seeds.

If digging or pulling the plant, remove the root crown. Herbicide control works best on rosettes. The hairiness of the leaves reduces herbicide effectiveness, so adding a surfactant is necessary. Minimizing disturbances may be the most effective and economical method of control. However, the long-lived seed bank suggests that total eradication is unlikely.

Fire eliminates the aboveground growth, but it stimulates new plants that germinate from the extensive seedbank. Mullein often grows after fires regardless of fire severity, even though it may be absent in the same or neighboring areas before the fire.

HOARY CRESS

With this perennial, the rosette appears 5 to 6 weeks after germinating. Stems appear



quickly from the middle of the rosette and produce flowers. By mid-summer, seeds are set. With good conditions, a second



crop of plants can set seed in the fall. It is also known as whitetop because its numerous white flowers give a white, flat-topped appearance. It reproduces from both seed and creeping roots but spreads mostly by its extensive root system. Roots extend in the upper 24 inches of soil but may extend 4 feet deep. Over 70% of its mass is in its root system. Roots have survived for over a year and still resprouted. Lateral roots from one plant can grow up to 12 feet outward in one year and up to 5 feet every year after that. It can produce up to 450 new shoots in one year, which can quickly result in a large colony that eliminates desirable vegetation. It emerges early in the spring and uses moisture and nutri-

ents first. This makes it highly competitive with desirable spring plants. One plant can produce up to 850 seeds per stem and 4800 seeds per plant. A great majority of seeds can germinate the first year. Buried seeds can remain viable in the soil for 3 years.

Hoary cress is difficult to control because of the high number of seeds produced, the length of time seeds are viable in the soil, the extensive and robust root system, and the varied habitats where it can grow. Any root segments left after disking, plowing, or pulling can form a new plant.

A fire may destroy all aboveground parts of the plant, but hoary cress can become established from existing roots or from seeds introduced after the fire.

HOUNDSTONGUE

With this biennial plant, the first year is a rosette with a thick, long taproot that has enough energy to complete growth in the second year when the plant bolts and forms a flowering stalk. It is also known as beggar's lice because each seed has a Velcro-like covering. The long-distance transportation of seed makes houndstongue a long-term management problem, even if it has been locally controlled. Houndstongue reproduces only by seed. Each plant has up to 2000 seeds. They may remain viable in soil for 2 to 3 years. Seeds are relatively large with stored energy. This gives the plant a competitive edge.



Since they are not perennial plants, individuals can be destroyed by digging or pulling. The root crown must be removed so that the plant does not regrow.

Houndstongue may show up after a fire through surviving or transported seeds or regrowth from the taproot. Nutrient reserves in the taproot acquired during the first year are sufficient for normal seed production the following year, even if the plants are completely defoliated early in the spring.

Panhandle Research and Integration for Discovery Education (PRIDE) Update

Kristi Paul, PRIDE board member and Sheridan County Weed Superintendent

The PRIDE Weed Management Area (WMA) recently joined NEWMAC, the Nebraska Weed Management Area Coalition, which is a statewide group involving any or all of the WMAs across the state. The pooling of funds and resources should help invasive weed control efforts statewide.

This year we again hosted a booth for the Upper Niobrara White Natural Resources District (UNWNRD) Conservation Festival. We worked with 250 5th grade students, who learned about noxious weed identification, spread, prevention, and control.


We are pleased to complete another edition of *The Weed Watch*, with many contributing authors and partners. This edition is going to 48 counties, and we expect it will reach 100,000 households. We welcome Middle Niobrara Weed Awareness

Group (MNWAG) to the table! This group works in some of the same counties as the Sandhills WMA, but the unique stretch of 76 miles of Scenic Niobrara River makes the group follow different federal rules.

PRIDE is making plans for an education and outreach project of signage at several recreation and wildlife management areas in its three counties (Sheridan, Dawes, and Box Butte), as well as the fairgrounds in each county. We will educate visitors to these locations by providing contact infor-

mation and by notifying them of the importance of identifying weeds, preventing the spread of weeds, and using weed-free forage. We plan to work with Boy Scouts and 4-H groups to install the signs.

We want to welcome Pat O'Brien, the new UNWNRD manager, who attended our recent meeting and has valuable information to share with us.



PRIDE
Panhandle Research Integration for Discovery Education

Dawes County
Shane Cullan
308-432-3056

Sheridan County
Kristi Paul
308-327-5629

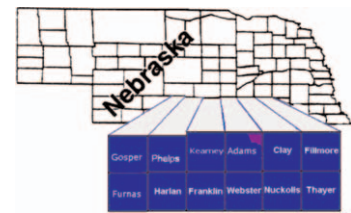
Box Butte County
Jan Bruhn
308-487-3755



Students play musical chairs to experience how invasive weeds replace desirable vegetation.



Students learn about using goats to control weeds.



TWIN VALLEY WEED MANAGEMENT AREA

Adams County Eric Walston 402-461-7173	Fillmore County Todd Boller 402-366-1921	Furnas County Todd Weverka 308-268-2824	Harlan County Tim Burgeson 308-928-9800	Nuckolls County Tim Stutzman 402-225-2361	Webster County Dennis VenWay 402-746-2890
Clay County Bruce Rumsey 402-762-3652	Franklin County Mark Goebel 308-425-3716	Gosper County Marty Craig 308-324-3771	Kearney County Joseph D. Anderson 308-832-2854	Thayer County Brian Schardt 402-365-4366	TWIN VALLEY WMA Project Coordinator Merle Illian 402-746-3560

Little Blue River Cleanout Begins Merle Illian, Project Coordinator

Since it was formed in 2004, the Twin Valley Weed Management Area (TVWMA) has put 99% of their effort and grant monies into the Republican River Watershed. This past month, the TVWMA focused on the Little Blue River Watershed. "We had grant funds from this year's Nebraska Environmental Trust (NET) specifically earmarked for this watershed," says Garold Ohmstede,

Chairman of the TVWMA. "Many of the problems that we encountered on the Republican River also exist within the Little Blue Watershed. It will definitely take a couple of years to accomplish what we want," says Ohmstede.

"The first item we want to address is the removal of debris and woody vegetation from the river channel," says Bryan Schardt, Thayer County Weed Superintendent. "We do have segments of the river that pose severe potential for flooding because of river blockage. Next we want to chemically treat willows and other woody vegetation that is growing on islands within the channel and along the perimeter of the river. This vegetation is also starting to choke off the flow of the river and is sucking a tremendous amount of water," says Schardt. "We will then follow up with a deep disking to allow the islands to scour."

For more information about the work being performed, contact your respective county weed superintendent, or call the Twin Valley Weed Management Area office at 402-746-3560.



River channel cleanout on the Little Blue River being performed by Frahm Construction.

Twin Valley WMA Hosts Tour Merle Illian, Project Coordinator

In August, the Twin Valley WMA hosted an informational workshop and tour, which showcased accomplishments that amazed all participants. "The tour began in Franklin, Nebraska, with 140 attendees," says Mark Goebel, Franklin County Weed Superintendent. "We had excellent support from our tour sponsors, which included Frahm Construction, Sky Copters, Nebraska Environmental Trust, Lower Republican Natural Resource District (NRD), and Twin Valley WMA. Guest speakers included Senator Tom Carlson, Mark Brohman (Executive Director of Nebraska Environmental Trust), and Mitch Coffin (Nebraska Department of Agriculture)."

The tour stops included:

- A phragmites problem within the river channel.
- A severe "pinch point" area in the river that was excavated and cleared.
- A DVD presentation showing the initial work on the river, including noxious weed spraying, channel cleanout, and deep disking.
- Center Creek and Turkey Creek cleanout and spring water revitalization projects.



Hay wagons transported participants through the riparian forest that had cedar trees and other invasive woody vegetation removed.

- Tree thinning along the perimeter of the river.
- Invasive vegetation control on Harlan Lake.

"The primary objective of the tour was to make everyone aware of the accomplishments, how funding has been spent, and the number of people directly impacted by the project. Grant funding of \$3.4 million dollars has been received since 2004, with \$1.9 million of matching funds and in-kind services provided. This 42% of in-kind to grant fund ratio speaks highly of our partners and their commitment to the project," says Goebel.

High Plains WMA Cost Share Available to Riparian Landowners

Justin Relka, HPWMA Coordinator

High Plains Weed Management Association (HPWMA) has had a productive summer. WMA Coordinator Justin Relka has been busy contracting follow-up spraying on current projects involving

Russian olive, salt cedar, and phragmites on the Platte River. HPWMA is also looking at (1) properties for first-time removal of invasives or (2) properties where work had been done in the past that might benefit from re-growth treatment. Cost share

for initial treatment projects is 75% from HPWMA and 25% from landowners. For a first re-growth project, cost share is 50-50. As we continue to look at re-growth treatment, Justin has noticed an increase in saltcedar and phragmites along the river, and this problem seems to be moving further west all the time.

Along with the re-growth and removal projects, HPWMA has been busy educating and informing landowners and communities about the High Plains program by distributing postcards and fliers and by attending county fairs. Justin has been contacting landowners along the river about removal and spraying and hopes to continue this work by contacting and working with landowners along the tribu-

aries and waterways. This great progress has been made possible by the help of the county weed superintendents who have also contacted landowners. So, we would like to give a big THANK YOU to them! Through this direct contact, High Plains hopes to set up new projects and continue to fight the battle against invasives along the river.

High Plains is excited about what lies ahead. There have been many positive reactions to the program of removing and treating invasive species this past year. We look to continue this success through fall and winter. If you are interested in being part of an HPWMA project, please call Justin Relka at 402-540-4011.



Coordinator - Justin Relka 402-540-4011

Banner County
Dick McGowan
308-436-4460

Cheyenne County
Brian Hiatt
308-254-3459

Deuel County
Cris Burks
308-874-2433

Garden County
Terry Raymer
308-772-4311

Kimball County
David Hottell
308-235-2681

Morrill County
Owen Walker
308-262-0372

Scotts Bluff County
Jeff Schledewitz
308-436-6709

Sioux County
Nick Sanderson
308-668-9453

A Good Year for Sandhills WMA and Middle Niobrara WAG

Barbara Good-Small, Cherry County Weed Superintendent

Winter's work is paying off! Sandhills Weed Management Area (SWMA) and Middle Niobrara Weed Awareness Group (MNWAG) are recipients of Nebraska Environmental Trust (NET) grant funding from Nebraska Weed Management Association Coalition (NEWMAC). This funding allows us to proactively detect and control invasive plants. Helicopter surveys for invasive phragmites, purple loosestrife, and Russian olive trees are being done on the Snake River in Cherry County and the Calamus River in Brown County. We are also surveying the Niobrara River in Cherry, Brown, and Rock Counties and the Keya Paha River in Keya Paha County. Follow-up control will be done where necessary. Garfield, Greeley, Nance, and Valley Counties are surveying and controlling invasive phragmites and purple loosestrife on the Loup and North Loup Rivers. Because of NET grant funding and the efforts of NEWMAC, this is done at no cost to landowners.

Additional projects have been possible due these grant funds. MNWAG contracted two University of Nebraska students to survey for garlic mustard, a watch-list weed, along the Niobrara River. SWMA also took on an Early Detection Rapid Response (EDRR) project – pulling, digging, and treating about five acres of houndstongue in Rock County.

In addition to the NET grant, MNWAG also received Niobrara Council funding. This was used in a cost-share program for landowners to treat purple loosestrife and leafy spurge in the Middle Niobrara area.

An anticipated Nebraska Forest Service grant will allow landowners to participate in another cost-share program this fall to control noxious weeds in the SWMA. Also, this is the third year that U.S. Fish and Wildlife EDRR funding has enabled SWMA to survey and control purple loosestrife and invasive phragmites at no cost to landowners.

SWMA recently printed a new brochure. It includes a map showing the 16 member counties, explains objectives, lists partners, and presents quick facts about SWMA's biologically and ecologically unique area. It also includes photos of target species. This brochure can be viewed and downloaded from our website www.sandhillswma.org.



Leafy Spurge Task Force Celebrates Its 25th Year

Rod Stolcpart, Rock County Weed Superintendent

After the fires of Brown and Keya Paha Counties in 2012 cancelled the 25th annual Leafy Spurge Task Force's meeting, we were disappointed, but we rescheduled for May 2013. We were

pleased with the attendance of 45 folks.

The tour included:

- Main Street Bassett Program by Don Coash
- Kuck Outfitters – Buffalo Ranch Management by Lance Kuck
- Fred Thomas Scenic Overlook north of Bassett
- Acres burned by fire near Springview
- Springview Saw Mill
- Springview Country Club for a delicious steak supper

Conference speakers were:

- Chris Bryan, DuPont – Current and Future Range and Pasture Offerings
- Abe Smith – Dow AgroSciences – Noxious Weed Control
- Dennis Bauer, Extension Educator – Dealing with Change, Dealing with the Drought
- Mitch Coffin, Nebraska Department of Agriculture – 25 Plus Years of Improved Public Awareness and Invasive Plant Control
- Rod Stolcpart – Closing Remarks

The Nebraska Leafy Spurge Working Task Force has quarterly meetings in February, May, August, and November. The meetings are always open to the public. Anyone interested in learning more about leafy spurge or any other weeds is encouraged to attend our meetings. For more information, please contact Rod Stolcpart by calling 402-822-0186 or via email at weedmanrod@abbnebraska.com



SANDHILLS WMA

P.O. Box 400
807 H ST

Burwell, NE 68823-0400
(308) 346-3393

Blaine/Thomas

Carol Conard
308-346-4047

Boone

Russell Stokes
402-386-5284

Brown

Doug Mulligan
402-387-2287

Cherry

Barbara Small
402-322-1067

Custer

Shawn Owens
308-872-2410

Garfield

Jay D Tetschner
308-346-5696

Grant

Jan Burgess
308-458-2821

Hooker

Neal Hayward
308-546-2706

Greeley

Walter Bjorklund
308-428-5955

Keya Paha

Travis Mundorf
402-497-3800

Loup

Lynn Strong
308-942-6218

Nance

Kevin Koziol
308-536-2523

Rock

Rod Stolcpart
402-822-0186

Valley

Darrell Kaminski
308-383-2701

Wheeler

Doug Reiter
308-654-3397

Platte Valley WMA and Whooping Crane Trust Hold Successful Tour

Brian Crabtree, Chairman of Platte Valley Weed Management Area

The Whooping Crane Trust (WCT), located along the scenic Platte River south of Alda, Nebraska, was the site of the Platte Valley Weed Management Area's (PVWMA) field tour held in August. Staff from the WCT graciously hosted around 60 attendees. These included a state senator; representatives from Nebraska Environmental Trust Fund, Nebraska Vegetation Task Force, Nebraska Department of Agriculture, Nebraska Game and Parks, The Nature Conservancy, and Platte River Recovery Program; many participating landowners; county board members from several counties; contractors; chemical company suppliers; weed control superintendents; and other interested parties.

CEO Chuck Cooper shared the mission of the WCT. It was evident that the accomplishments of WCT's many partners are helping preserve one of our state's greatest natural resources. Returning the river to its original condition by reducing invasive species creates enhanced habitat for many wildlife species, several of which are endangered. **Often, weed-control professionals tend to focus solely on the eradication or control of invasive and unwanted plants**



without considering the bigger picture. Regardless of where you are in our state, treasures need to be protected to ensure sustainability for future generations.

Project coordinator, Rich Walters, presented the efforts undertaken since 2007. The PVWMA has written grant applications, contacted numerous sources for funding, and maybe most importantly, contacted hundreds of landowners along the Platte River. County weed superintendents also spent numerous hours visiting with

landowners about their responsibility as funding sources dwindle. This relationship with landowners has been vital to the success of the project. Many town hall meetings have been held to inform and educate stewards of the land. Rich appreciated their cooperation and thanked them for their continued efforts. Rich also explained that much of the funding went to on-the-ground projects, which were greatly expanded in scope by matching funds from several entities.

Throughout the day, we were shuttled to sites on the property where we listened to experts in plant biology. We learned about the methods and process of patch-burn grazing. We sat on a vast river meadow that was once full of eastern red cedars and cottonwoods and which is now going through the long process to return to native vegetation. We heard about the effects of the recent drought and what we can expect in the near future with possible over-grazing and opportunistic plants filling in gaps left by the lack of moisture.

Several contractors demonstrated their specialized equipment that is used to disk river channels, shred unwanted tree growth, and spray in the river channels. We rode in airboats used to do touchup work along the understory of the banks of the river. Then we saw the skills of the crew of Provine Helicopter Service of Greenwood,

Mississippi. They demonstrated the unbelievable accuracy with which they apply herbicide to target species along the river. They landed on top of a truck to load the helicopter with water, chemical, and fuel. The pilot said that on a good day of spraying, he will land on the tender vehicle 55 to 60 times.

Rich concluded the day with a brief presentation about future projects, funding sources, landowner cooperation, and the concept of Early Detection Rapid Response (EDRR). Using EDRR, Nebraska weed-control professionals have already seen the success of this approach in proactively reducing the spread of invasive species.



PLATTE VALLEY WMA

Buffalo County
Mitch Huxoll
308-236-1244

Merrick County
Corwin Roscoe
308-946-5375

Dawson County
Marty Craig
308-324-3771

Phelps County
Charles Brooks
308-995-6688

Hall County
Rob Schultz
308-385-5097

Polk County
Jim Carlson
402-747-2921

Hamilton County
Brian Crabtree
402-694-3666

Sherman County
Erv Dzingle
308-745-1513 Ext. 111

Howard County
Rob Schultz
308-380-2099

PVWMA Coordinator
Rich Walters
308-390-2511



Thanks to the Nebraska Environmental Trust for funding projects to control invasive weeds in Nebraska



WEST CENTRAL WMA

Arthur County
Kent Anderson
308-764-2203

Keith County
Donald Chandler
308-726-3375

Lincoln County
Rod Yost
308-532-4590

Logan-McPherson
Richard Cook
308-636-6157

Spotlight on Leafy Spurge

Kristi Paul, Sheridan County Weed Superintendent

Leafy spurge (*Euphorbia esula* L.), a long-living, non-native perennial, has been in the United States since the late 1800s. It was brought by accident in the ballast of ships from Europe or in seeds carried here by the Russian Mennonites in the 1870s. This very aggressive and invasive plant became a Nebraska noxious weed 1960s.

Appearance

Height: Leafy spurge is commonly 1 to 3 feet tall, with alternate, narrow, smooth-margined leaves.



Flowers: Umbel flowers are surrounded by heart-shaped, showy, yellow-green bracts. Flowers occur in many clusters toward the top of the plant. It can bloom from May to September.

Reproduction

Roots: Leafy spurge has an incredibly vigorous root system. The extensive roots can reach depths of 30 feet and spread 20 to 30 feet wide underground. Along the roots, pink buds form and send up shoots to begin new plants. The roots contain substantial nutrient reserves that allow the weed to recover from stress, including control efforts, which contributes to its persistence and spread.



Seeds: Each flowering shoot produces an average of 140 seeds, which reach peak germination in May. Seeds are expelled up to 15 feet when capsules dry. These seeds are viable for 8 to 10 years in the soil. Seeds are also spread by water, birds, animals, and people.

Habitat

Leafy spurge infests rangeland, roadsides, woodlands, disturbed sites, sub-irrigated meadows, and shelterbelts. Leafy spurge currently infests over 250,000 acres in 82 Nebraska counties.

Treatment Methods

Once established, leafy spurge is one battle you will be fighting forever. Persistence is the key to leafy spurge control.

Herbicide Control: Tordon 22K, Tordon plus 2, 4-D, Garson, Plateau, and Perspective are the most commonly used herbicides for the control of leafy spurge. The *2013 Guide for Weed Management* (UNL EC-130) gives many different products and treatment options. There are three important factors to remember: (1) Read and follow the label on the herbicide, as the label is the law. (2) No product used one time will control leafy spurge over the long term. Retreatments will be necessary. (3) In certain areas, such as steep hillsides or deep canyons, accessibility can be an issue, so methods other than herbicide control may be an option.

Biological Control: During the 1980s, scientists and researchers started testing the insects that are native to leafy spurge in Europe, and they eventually brought them to the United States to help control leafy spurge. However, before an insect can be brought into our country, it goes through years of testing to make sure it is host-specific (will not feed on any other weeds or plants in our country). Several insects have been approved for leafy spurge bio-control. Four different flea beetles have been used successfully. The adults feed on the foliage and the larvae feed on the root hairs, eventually killing the plant. With the red-headed leafy spurge stem borer, the adults "girdle" the stem, and the larvae feed in the stems, inhibiting the plant's ability to transport or store nutrients. Other insects, such as the leafy spurge hawkmoth and the tip gall midge, have been also used successfully. Combining the impacts of several different types of insects should be more effective. Often bio-control is used as one tool in the management of leafy spurge.

Many factors contribute to the success or failure of leafy spurge bio-control: soil type, timing, type of insects released, number of insects released, and landscape. Throughout Nebraska, hundreds of releases have been made, with varied results. Some have been successful and some a complete failure. With an established insectary, possibly the most important factor is to have patience, as it can take 5 to 7 years to see results from leafy spurge insects. Bio-control should be approved by your local county weed superintendent, and weed-infested boundaries will still need to be controlled to keep leafy spurge from spreading.

Grazing: Sheep and goats can help control leafy spurge. Sheep prefer the early spring stage of leafy spurge, while goats will eat leafy spurge at any time during the growing season. For optimum results, grazing should be done spring and fall for several seasons. Grazing followed by herbicide would be another control option.

There is no perfect recipe for leafy spurge control.

Interesting facts

- Leafy spurge contains a white, milky latex sap in all plant parts.

- Leafy spurge can reduce grazing capacity of rangeland or pastures by 50 to 75 percent. Cattle will not graze in dense leafy spurge stands, and these areas are a 100 percent loss to producers.

- When spraying leafy spurge, an area 15 feet larger than "the patch" should be sprayed because the seeds are exploded out of the plants and start the little seedlings that hide nearby.

- Research shows that leafy spurge acres infested in the United States have doubled every decade. Nebraska has not let that happen. Data show that the acres have increased only slightly due to landowners continually working to control this invasive weed.



Did you know?

Fall is the best time to control deep-rooted perennials such as leafy spurge and Canada thistle. Preparing for the winter, the plants pull nutrients deep into their roots. Herbicide applied at this time will also be pulled into the roots, resulting in the highest percentage of control. Herbicides applied as near to "frost" as possible do an excellent job.



PRIDE serves as a cornerstone to build and maintain partnerships between the many cooperators in invasive weed management and education. With this collaborative effort, a more efficient and successful approach to invasive weed management and awareness is achieved.

PRIDE's efforts in pooling of funds and resources from contributors will result in a compounding of investments and rewards. For more information or to get additional copies of *The Weed Watch*, contact Kristi Paul, Sheridan County Weed Superintendent, PO Box 449, Rushville, NE 69360. Phone 308-327-5629

Invasive Plants Watch List: 2013

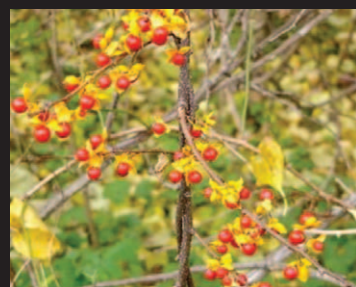
Kristi Paul, Sheridan County Weed Superintendent and PRIDE board member

These lists were developed to provide a region-based list of invasive plants to be “on the watch for” in Nebraska. Each ecoregion’s species were categorized based on early detection and rapid response potential. A complete list and images of invasive plants in Nebraska can be found at <http://snr.unl.edu/invasives>.

Category 1: Future Invasive Species



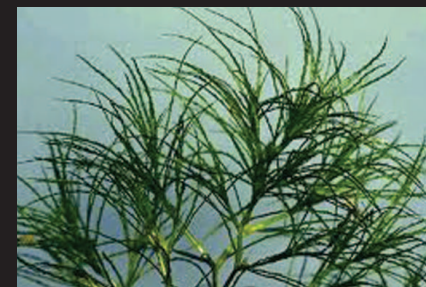
Giant Reed



Oriental Bittersweet



Water Hyacinth



Brittle Naiad

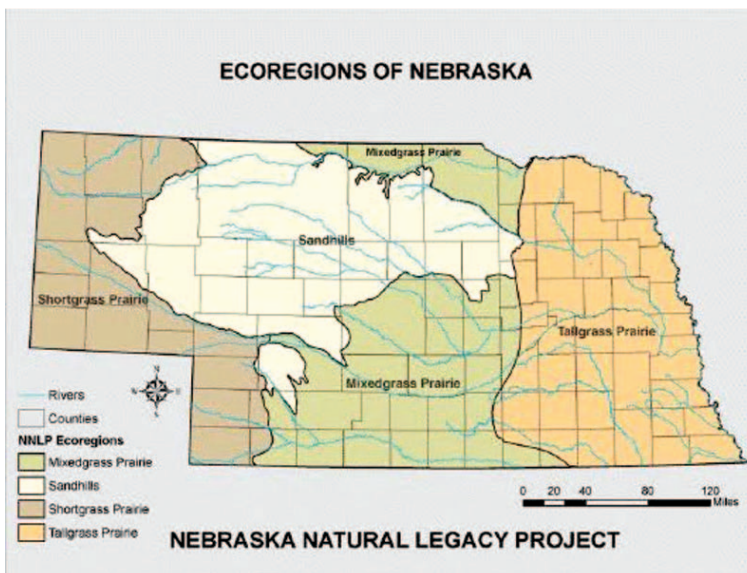


Hydrilla



Giant Salvinia

With the exception of Giant Reed, these species have not been found in Nebraska yet, but they pose a significant risk if introduced. These plants are the same for all ecoregions of the state.



Category 2: Shortgrass Prairie Ecoregion



Russian Knapweed



Goatstrue



Black Henbane



Houndstongue



Saltlover



**Perennial
Pepperweed**

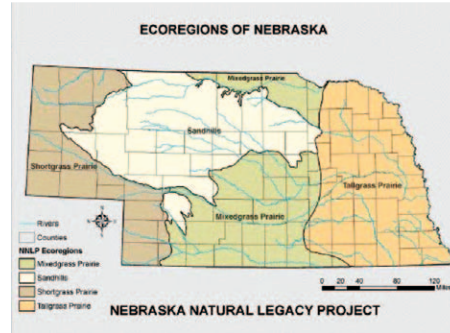


Black Knapweed



Houndstongue

Category 2: Sandhills Ecoregion



**Perennial
Pepperweed**



Yellow Bedstraw



Eurasian Watermilfoil

The complete list of Invasive Plants in Nebraska along with species photos can be found at the Nebraska Invasive Species Project website:
<http://snr.unl.edu/invasives>.



Sulphur Cinquefoil



Amur Maple



**Russian
Knapweed**

Category 2: Mixedgrass Prairie Ecoregion



Garlic Mustard



Caucasian Bluestem



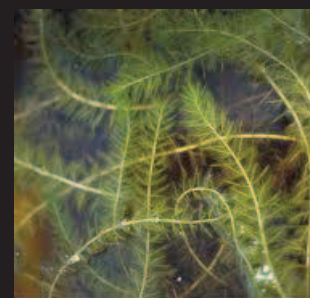
**Sulphur
Cinquefoil**



Cutleaf Teasel



European Alder



**Eurasian
Watermilfoil**



**Japanese
Honeysuckle**

Cheatgrass and Japanese Brome Out-Compete Desirable Vegetation

Cindy Tusler, Range Livestock Extension Educator, UNL Extension, Sheridan County

Cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*) are annual grasses native to Europe and Asia. Both brome grasses were introduced into western North America in the late 1800s. These grasses were probably spread unintentionally across the western U.S. in straw used as packing materials or in contaminated grain seed. In some rare cases early on, both species were actually seeded as forage grasses.

The two annual grasses can look very similar. Cheatgrass tends to have longer awns and the whole plant will turn a purplish color when mature or subjected to water stress. Japanese brome has a more rounded seed head and typically turns a pale golden yellow at maturity. Both plants can easily survive on all soil types. As seedlings, Japanese brome and cheatgrass are somewhat difficult to distinguish from each other. In general, both plants begin growth as a “bunch” of stems and leaves (tufted growth) that lay relatively flat against the ground. Both have a ragged, membranaceous ligule that is relatively easy to see. Neither species has auricles. Both species tend to have relatively hairy leaf blades and leaf sheaths. However, the hair length on cheatgrass tends to be about a third of the length of that on Japanese brome. The shorter length gives cheatgrass a softer feel than Japanese brome, which feels more bristly.

Cheatgrass is often more common in cropped fields. Japanese brome will be found with cheatgrass or can be more dominant on grasslands (rangelands or pasturelands). Both grasses can be found in heavily grazed pastures but can also invade well-managed pastures, especially in drought years.

Cheatgrass and Japanese brome are both considered winter annuals, but they can also initiate growth in the spring. As a winter annual, they grow similarly to winter wheat. That is, they germinate in the fall when soil moisture is adequate, produce a few leaves, and then overwinter in this vegetative state. Having roots in the soil and a few leaves above ground next spring gives them a jump start on the growing season and allows them to out-compete desirable grasses.

With drought, both plants may use their alternative strategy to germinate in the spring. The 2011 growing season had a lot of moisture to support a good growth year for all plants. The area then experienced one of its most severe droughts on record in fall 2011 through spring 2013. **Drought opened up a lot of bare ground in all areas, including both well-managed and less healthy areas.** Bare ground combined with the late,



Cheatgrass

wet snows of April and the good rainfall in spring 2013 gave these pesky annuals the advantage over drought-weakened perennial plants. Producers have reported heavy spring stands of cheatgrass and Japanese brome that matured by early June. Others reported having very little to no annual grass in the spring, followed by heavy growth of Japanese brome in early August.

Some research suggests Japanese brome seeds may actually stay on the plant through the first fall, then drop to the ground during winter or spring, and germinate the following fall. **In that case, and if other elements like moisture are favorable, we could see a good deal of 2013's Japanese brome seeds germinate in fall 2014.**

Weed management specialists describe three general weed management strategies: prevention, eradication, and control. Eradication, the total removal of a weed from an area, is unrealistic for a widespread problem for plants like cheatgrass and Japanese brome. Prevention and control of these plants is a much more attainable goal. Prevention is the step that land managers implement to keep the weed from being introduced onto their land. Such steps include keeping equipment free of weed seeds, planting only certified seed, and when purchasing hay from out of the area, purchasing only certified weed-free hay. These techniques are only part of the prevention strategy because there are always additional ways weed seed is introduced. A key, powerful technique of the prevention strategy is early detection and control of small infestations.

To fully employ control techniques, land managers must understand the biology of the weed, especially when the plant initiates growth, and what the plant look likes in an immature stage. Plant ID skills are a must. If the land manager is not able to identify the weed until it has produced a seed head, then it is often too late to apply many of the control techniques. This is especially critical for annual grasses whose sole purpose is to grow fast and produce a lot of seeds. Given the right conditions, each of these two grasses can produce over 5000 seeds per plant. In some situations, this can add up to 20,000 seeds per square meter. Japanese brome



Japanese brome

seeds can remain viable in the soil for several years. Cheatgrass seed typically remains viable for about four years, although some seeds may persist up to 10 years.

Litter management is very important in the control of these species because of its impact on soil moisture. Brome grass litter decomposes slowly. Accumulated litter retains soil moisture near the soil surface, which helps increase brome seedling establishment. Annual brome grass production is very erratic, as the plant's growth is influenced by fall and spring conditions and interaction with litter accumulation. Because of this erratic nature, annual bromes can give the impression of sudden and rapid invasion during favorable periods.

Selection of control techniques depends on the ecological potential of the site, desired plant community, extent of invasion, land use objectives, etc. **Ultimately, management techniques must be integrated if a land manager intends to work toward long-term control. With invasive weeds such as Japanese brome or cheatgrass, a strategy of “one and done”, such as grazing early one spring or spraying once, will not lead to the desired outcome.** Periodically changing herbicides with different modes of action will produce better results and may reduce potential resistance. Although herbicide-resistant annual brome grass communities have not been found locally, other places in the U.S. have had these issues.

Livestock grazing, especially by cattle, early in the annual brome grass life cycle can be effective in setting the grass back. However, it can be very difficult to control annual bromes through grazing alone. For grazing to be effective, graze the area early with heavy stocking to remove the leaves from the greatest number of plants. Annual grasses are an unreliable forage resource, and are not the desirable option to have in a pasture. Research has shown forage production in a western wheatgrass pasture decreased with cheatgrass infestations. As forage, both Japanese brome and cheatgrass can provide relatively high quality forage shortly after germination. However, both plants become very unpalatable as they mature and rapidly become very poor forage. The awns on cheatgrass can also cause

mechanical injury and infection to the eyes and mouths of grazing livestock.

Pseudomonas fluorescens is a naturally occurring soil bacterium that has shown some success in controlling the root growth of cheatgrass. Ann Kennedy, USDA Agricultural Research Service soil microbiologist at Washington State University, is conducting the research. Bacteria are applied in fall by aerial spraying. Subsequent rain washes it into the soil, where it grows over winter and is ready to attach itself to the roots of cheatgrass plants in spring. The bacteria do not kill the cheatgrass but cause the roots to grow more slowly. This allows native perennial vegetation to compete for soil moisture and nutrients.

Whether or not prescribed burning is beneficial in controlling annual bromes depends on the site. Fire as a control measure may or may not be helpful in areas of Nevada and Wyoming due to their precipitation regimes, or presence of non-fire resistant species like sagebrush. Fire can be helpful when used in conjunction with herbicides. It can be used to remove a dense litter cover to increase the likelihood of herbicides reaching the soil surface or the young brome grass. Grazing may also be used to disturb dense litter, though the potential for mechanical injury to the grazing animal will increase at this growth stage. In South Dakota, Japanese brome was decreased for two years following spring, summer or fall grazing when Mother Nature contributed a dry fall.

Chemical herbicides that appear to work well in an integrated approach on rangelands are imazapic (Plateau) and glyphosate. Brian Mealor, University of Wyoming Extension Weed Specialist, has done extensive herbicide research on cheatgrass control, and cautions that calibration of spray equipment is critical for positive results. **For best control, herbicides should be applied before plants reach the three-leaf stage.** With many herbicides, the amounts applied at this growth stage can be quite small, as little as one ounce per acre. If the equipment is not properly calibrated the chemical could easily be under-applied, resulting in no control. Conversely, applying too much herbicide could negatively impact desirable plant species on the site. In Wyoming, Mealor recommends glyphosate be used in the spring prior to seed production. He typically uses very light rates of glyphosate prior to desirable grass green-up. He has seen good control with imazapic when it is applied in the fall as a pre-emergent or a very early post-emergent, especially if applied before the grass is two inches tall. As always, read and follow all labels on herbicides.

The bottom line: control of cheatgrass and Japanese brome takes persistence.

Sunflowers!

Chris Helzer, Prairie Ecologist, The Nature Conservancy

The sandhills of Nebraska consist of nearly 20,000 square miles of prairie. The scale can be hard to comprehend until you have driven through it for hour after hour, gazing at the beauty spreading out all around you. When I drove through a good portion of the eastern sandhills this week, a lot of it looked like this photo – covered with blooming yellow sunflowers.

Many readers of this article will be thinking, “Wow! What a beautiful year in the sandhills!” But I know others of you are thinking, “Ugh, what do we have to do to get rid of these invasive weeds?”

I’m going to get to that discrepancy, but let’s first back up and look at why the sunflowers are so abundant this year. First, the sunflower species we’re talking about here is an annual called plains sunflower (*Helianthus petiolaris*). It germinates from seed in the spring, flowers in the summer, and dies at the end of the same year.

During the drought of 2012, annual sunflowers were among the few plant species able to continue growing and flowering during the hot dry summer. Because of that, sunflowers were able to produce copious amounts of seed, many of which ended up on the ground at the end of the year. Few other grassland plants produced anything comparable to the seed crop of those sunflowers.

The spring of 2013 brought abundant rain to the dry sandhills. In addition, the plant litter from last year’s dry growing season was thin and sparse, allowing a lot of light to hit the soil. That combination of abundant light and moisture was exactly what all those plains sunflower seeds needed, and they germinated.

Of course, germination doesn’t ensure survival, and many annual plants germinate each year, only to be quickly overshadowed and outcompeted by strong perennial plants. Perennials have the advantage of a pre-existing root system that can monopolize moisture and nutrients from the soil while annuals are still struggling to get started. In years when perennial grasses and wildflow-

ers are strong, there is very little space for annuals to grow, except in places where the soil and plant community were disturbed by digging animals or intensive grazing/trampling.

However, in the spring of 2013, not only were conditions perfect for plains sunflower germination, competing perennial plants were also weak from drought and grazing in 2012, leaving lots of open space below-ground for sunflower roots to take advan-

Ok, back to the perception issue. Sunflowers are one of the most popular and well-known flowers in the world. They are big, attractive, and easy to recognize. On the other hand, many farmers and ranchers have grown up learning that sunflowers (of any kind) are weeds. The presence of sunflowers in a field or pasture – especially an abundance of them – can be seen as a badge of shame for the landowner who is clearly not managing his/her weed problems adequately.

flowers, but that’s actually a counterproductive strategy. First, the annual sunflowers are going to die at the end of the season anyway, so if you want fewer sunflowers next year, the best strategy is to focus on limiting the germination and growth of next year’s crop by allowing perennial grasses and wildflowers to regain their dominance. Second, herbicide spraying will kill a number of other plant species that are both valuable as forage and competitors with sunflowers and other annuals. Why spend money to weaken the long-term viability of your grassland?

It’s also important to remember that cattle do eat sunflowers – they particularly like them early in the season when the leaves and stems are tender, but will also seek out the nutritious buds and flowers later in the season. The evidence of that can be seen right now; pastures grazed at certain times this year have many fewer blooming sunflowers than those that haven’t yet been grazed this season. In addition, of course, sunflowers are among the most valuable grassland plants in a prairie for wildlife and pollinators. They produce large nutritious seeds for birds and other wildlife, and have abundant and accessible supplies of nectar and pollen that attract numerous pollinator species. In short, sunflowers may not be everyone’s favorite plant, but they’re far from a useless weed or invasive threat.

For those of you who started out reading this article as fans of sunflowers, good for you! If you get the chance, you should take a drive through Nebraska’s sandhills this summer and enjoy the scenery – it’s not likely that we’ll see another year like this for a while. For those who are appalled by the abundance of sunflowers this year, maybe you can take some comfort from the fact that it’s a temporary phenomenon, and one tied to a particular combination of weather factors more than anything you or others did as land managers. Things will be different next year.

Regardless of whether or not you like sunflowers, I guess there’s one thing we can all agree on. The year 2013 will be one to remember!



tage of. In short, you couldn’t have designed a better situation for the sunflower. It was one of the few plant species to produce seed in 2012, and then it got light, moisture, and weak competition in 2013. It’s no wonder the hills are yellow!

Some people will look at this photo and see an amazing abundance of pretty wildflowers. Others will see weeds running amuck. At the Niobrara Valley Preserve, last year’s wildfire increased the favorable conditions for plains sunflower by creating massive amounts of bare ground for germination. While it looks like a monoculture from a distance, hidden among the sunflowers are lots of grasses and other plants that are slowly regaining their vigor. By next season, this will be a very different looking prairie.

The important thing to remember if you’re a rancher, however, is that the sunflowers are not outcompeting perennial grasses. Instead, the sunflowers are opportunists, taking advantage of the fact that grasses are weak. As perennial grasses recover from last year’s drought and/or grazing, they will reclaim the root space they lost in 2012 and sunflowers will have much less room to grow next year. Plains sunflower is a native prairie plant, and its role is to fill the space left when other plants are weakened (similar to ragweeds and other opportunistic species). If sunflower wasn’t filling that space, another “weedy” species would, and the alternative could be much worse.

Some ranchers will be tempted to spray their pastures to kill off the “invading” sun-

Something for the Kids

N O X I O U S W C E L T S I H T S S E L E M U L P
 S E I T N U O C O M P E T I T I O N E A E U N R D
 T E S E C A N I N T D V R S B D E E C F O S U E U
 C N R F D A N T T R L I A Y D E E W T O N K S V E
 E W M I T E S I R E E S I H E E N E D R S T U I L
 S G A R S E D E O E I S L M E W E T H E L H A R B
 N N N T Y E R S L S F E S A W D T W C H E I L E A
 I I A S R L A I N N E R E P P N A O N O V S T G R
 E L G E E T Y L H A R G O P A I O C W U O T T A I
 L L E S T T A G E N T G S I N B I C O N H L D R S
 E U M O A M G D L S S A E N K F N A I D S E R O E
 A P E O W O I W P N P W I G I G S N I S C R S F D
 F H N L T R W A W T E D C C I O V A R T L U K E N
 Y C T E P H R A G M I T E S O A A D L O N T L E U
 S R D L N W L S A I T P P Z S R Y A R N I S A R M
 P A E P O N H K N S S T S I A R S T N G S I W F O
 U E T R H T S F E T L N V R T T N H O U F O E D N
 R S G U A A O T S S O E O N H O C I I E I M D E I
 G E E P R R H O W E O O U I C T A S T L R M I E T
 E R L B M G H L S P T O P O A I R T C E E C S W O
 A A E D I E T O N S C E I P S W P L A U N N A L R
 N N A F C T I M I N G B L A I N N E I B E S T O P

HIDDEN WORD FIND – Responsible landowners take pride in their management efforts to control weeds on private lands in order to protect our environment. Sometimes the greatest challenge is to understand how invaders spread, the groups involved in treating them, and tools they use. Find the words listed below in the puzzle to the left.

Words are arranged horizontally, vertically, diagonally, forwards (left to right), backwards (right to left) and top to bottom or bottom to top.

Word List for Word Find

acre	grow	new	shovels
action	help	noxious	sidewalk
agent	host specific	NWCA	sign
aggressive	houndstongue	patch	species
annual	inform	paths	target
Asia	insects	perennial	timing
biennial	invasive	pests	tools
bindweed	knawweed	phragmites	towns
biocontrol	knotweed	plan	trails
Canada thistle	lawns	plumeless thistle	trees
cities	leafy spurge	PRIDE	undesirable
competition	management	pulling	unusual
control	mapping	purple loosestrife	water
counties	mites	research	weeds
country	moisture	river	weed free forage
field	monitor	roots	WMA
fight	musk thistle	saltcedar	yards
fire	Nebraska	seed	zoos

A Different Approach to Restoration Work

Shelley Steffl, Nebraska Game and Parks Commission

After the 2012 wildfire season, a group of resource professionals (Lyndon Vogt, Upper Niobrara White Natural Resource District; Shelley and Matt Steffl, Nebraska Game and Parks Commission; and Doak Nickerson, Nebraska Forest Service) had a brainstorming session about easy, less-expensive ways to re-establish woody plants throughout the Pine Ridge. In most of the burn, the terrain is so steep that mechanical seeding and planting are not options. Planting by hand is also difficult. So the question arose, “Why not try another alternative?”

Wildlife, from deer and elk to woodpeckers and pocket mice, call these forests home. Many animals were moving back into the burned areas while patches of timber were still burning. Since these animals are a natural means of plant transport, why not use them to re-introduce desirable plants?

We created about 900 seed blocks to be used in burned areas throughout the Pine Ridge. The blocks consist of 11 species of native trees and shrubs. Some species are per-

haps less common than others, but they are still important to our forest/woodland diversity. We used a mix of cracked corn, rolled oats, and molasses to build the seed blocks. The mix acts as filler and attractant to draw animals to the blocks. Landowners are instructed to put the blocks on north- or east-facing slopes halfway up the slope. These slopes tend to have better shading from the sun and retain moisture longer. This increases germination of seeds dropped by wildlife or left in block remnants. The mid-slope location also tends to have sparser vegetation, thereby reducing competition and allowing more seed-to-soil contact for the woody plants.

What are we expecting the wildlife to do? There is of course the obvious: eat the blocks and then deposit the seed via scat as they move throughout the ridge. We know it is possible that some of these woody plant species will not survive the digestive tract of an elk or the crop of a turkey. Some seeds just do not have a hard enough seed coat to survive. But there are other ways that wildlife transports seeds. For instance, mice and other rodents col-

lect seeds in their cheek pouches and then store them in underground food caches. Squirrels dig holes and bury their bounty throughout their territories. Animals drop seeds while chewing. The seeds then become embedded in the soil through hoof/paw/foot action by the critters visiting the blocks.

About 100 seed blocks remain from the initial production. Work is beginning to produce more blocks for fall distribution. Landowners who were either affected by recent fires or are within two miles of the fires are eligible to purchase seed blocks. They will again sell for \$3 per block, and there is no limit on the number of blocks a landowner may purchase. This is far less than the actual cost of production. They are available at that rate thanks to funding from the Nebraska Environmental Trust.

If you have any questions about the program or are interested in purchasing blocks, please contact Shelley Steffl at the Nebraska Game and Parks Commission, 308-432-6183.

County-Added Noxious Weeds

Kristi Paul, Sheridan County Weed Superintendent and PRIDE board member

In addition to the ten weeds that have been declared noxious in Nebraska, every county has the option to petition the Director of the Department of Agriculture to place additional weeds on the “county-added noxious weed” list. Many counties in Nebraska have county-added noxious weeds, which landowners are required to control.



Field Bindweed

Banner	Garden
Box Butte	Morrill
Cheyenne	Scotts Bluff
Dawes	Sheridan
Deuel	

5 to 6 feet long. Perennial - spreads by seeds and rhizomes.



1 to 4 feet tall. Biennial - spreads only by seeds.

Houndstongue

Dawes
Sheridan



Tall Thistle

3 to 5 feet tall. Biennial - spreads only by seeds.

Fillmore



Flodman Thistle



Scotch Thistle

Banner
Cheyenne
Dawes
Morrill
Kimball
Sheridan
Sioux

1 to 10 feet tall.
Biennial - spreads only by seeds.

Notice the underside of the leaves of both Tall and Flodman Thistles is silver, which is a characteristic of native thistles.



1 to 2.5 feet tall.
Perennial - spreads by seeds and rhizomes.

Woollyleaf Bursage

Banner



Bull Thistle

Rock

1.5 - 6.5 feet tall.
Biennial - spreads only by seeds.



1 to 3 feet tall.
Biennial - spreads by seeds and rhizomes.

Perennial Yellow Bedstraw

Cherry
2 to 4 feet tall.
Perennial - spreads by seeds and rhizomes.



GOOD NEIGHBORS CONTROL NOXIOUS WEEDS!

Nebraska's Noxious Weeds

It is the duty of each person who owns or controls land to effectively control noxious weeds on such land.

Noxious weed is a legal term used to denote a destructive or harmful weed for the purpose of regulation.

The Director of Agriculture establishes which plants are noxious. These non-native plants compete aggressively with desirable plants and vegetation.

Failure to control noxious weeds in this state is a serious problem and is detrimental to the production of crops and livestock, and to the welfare of residents of this state. Noxious weeds may also devalue land and reduce tax revenue.

Canada Thistle



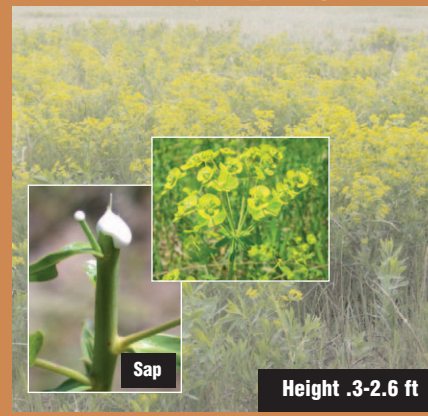
Height 1-3.9 ft

Musk Thistle



Height 1.6-9.8 ft

Leafy Spurge



Height .3-2.6 ft

Spotted Knapweed



Height 1-3.9 ft

Plumeless Thistle



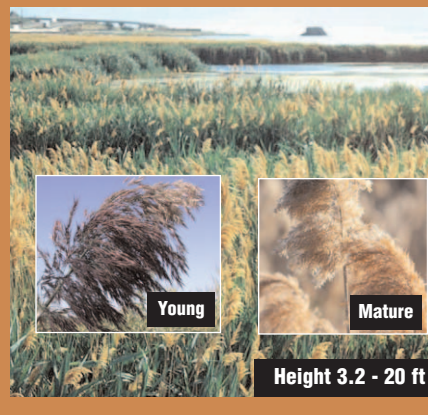
Height 1-4.9 ft

Saltcedar



Height 3.3 - 20 ft

Phragmites



Height 3.2 - 20 ft

Diffuse Knapweed



Height 1-3.9 ft

Japanese Knotweed



Height 3 - 10 ft

Giant Knotweed



Height 8 - 13 ft

Purple Loosestrife



Height 1.3 - 8 ft

Sericea Lespedeza



Height 1.5 - 6.5 ft