

# Central Grasslands Forum



NDSU Central Grasslands Research Extension Center  
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**NDSU** NORTH DAKOTA  
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## Ecological Sites Dictate Pasture Carrying Capacity

Miranda Meehan, NDSU Extension Livestock and Environmental Stewardship Specialist



An ecological site is a distinctive kind of land with specific soils, vegetation and environmental conditions. Ecological sites change across the landscape due to differences in soil types, hydrology and topography (see Figure 1). These differences influence the plant community and the amount of forage on the site, which directly impacts the carrying capacity of a pasture. For example, a loamy ecological site at the CGREC produces between 1,600 and 3,600 pounds of forage per acre annually, whereas, a shallow loamy ecological site in the same pasture produces between 1,500 and 2,900 pounds of forage per acre.

Natural disturbances and management are the two main reasons for a shift in plant composition and forage production on a site. Plant communities can be tracked through state and transition models. A chart showing the possible states and changes for a loamy ecological site at the CGREC is shown in Figure 2 on page 3.

The plant community at the top of the chart is a native grassland community dominated by green needlegrass and western wheatgrass, which could produce 2,750 pounds/acre of forage on average. This would be a carrying capacity of 0.75 animal unit months/acre, and 1.73 acres would be required to support a 1,400-pound cow and her calf for a month.

Long-term overgrazing of this plant community can result in a Kentucky bluegrass-, blue grama- and sedge-dominated community (third box down). This community has an average annual production of 1,600 pounds/acre and a carrying capacity of 0.44 animal unit months/acre. This would require 2.93 acres for a 1,400-pound cow and calf per month.

Knowledge of the current state and potential states of the ecological sites within your pasture is imperative to

(Continued on page 3)

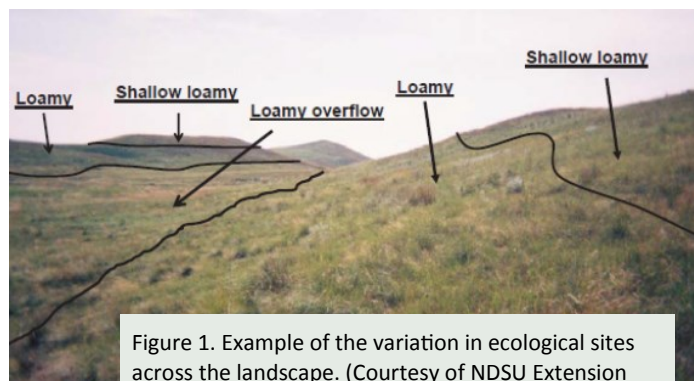


Figure 1. Example of the variation in ecological sites across the landscape. (Courtesy of NDSU Extension Publication R-1556, *Ecological Sites of North Dakota*)



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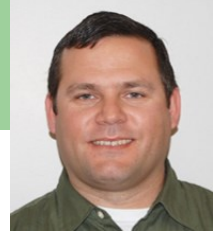
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Photos by Rick Bohn and Janet Patton, CGREC

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### Cows and Crops: Manure as a Fertilizer for Corn Production

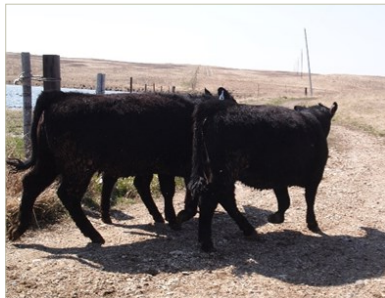
Paulo Flores, Nutrient Management Specialist, Carrington Research Extension Center



Do you ever wonder about the benefits of manure that your cattle herd may provide? One of the many advantages to having livestock is the recycled nutrients that they can return to the land.

Through our work at the Carrington Research Extension Center (CREC), I have developed an Excel spreadsheet that allows farmers to compare the nutrient value, on a cash basis, of solid beef feedlot manure with commercial fertilizers for corn production in North Dakota. Calculations are based on the current market rate cost per nutrient unit.

While the Manure Calculator is not intended to provide nitrogen recommendations for corn (see [www.ndsu.edu/pubweb/soils/corn/](http://www.ndsu.edu/pubweb/soils/corn/)),



the Manure Calculator uses information regarding field area, soil nutrients, corn yield potential, nutrient availability, and costs of commercial fertilizers and

manure. When using the Manure Calculator, the values can be changed at any time, and different options can be selected from the drop-down menus. This allows the user to change those values to reflect his or her operation. Once the sheet is filled out, you will see a “Net Cash Value” per acre when using manure amendments instead of commercial fertilizers.

The Manure Calculator calculates a balance of nutrients when using manure or commercial fertilizer alone or in combination with each other. A negative “nutrient balance” means that additional nutrients are needed to reach the recommended amount of a specific nutrient for your corn. Rates and associated costs for the commercial fertilizer needed also will be included.

A printer-friendly version of the instructions and information document and the Manure Calculator can be downloaded from the CREC’s website under “News.” Internet Explorer is required to access this program at <http://tinyurl.com/manurecalculator>. For more information, please contact Paulo Flores at the CREC by phone (701) 652-2951 or email at [paulo.flores@ndsu.edu](mailto:paulo.flores@ndsu.edu).

### An Unwelcome Plant at the Corrals

Fara Brummer, Area Extension Livestock Systems Specialist, CGREC

Is it a thistle? An escaped ornamental?

Black henbane (*Hyoscyamus niger* L.) often catches the eye because it stands 4 to 5 feet tall in abandoned lots and corrals. At first glance, it looks like a thistle, but its large leaves lack the prickly nature of thistles, and they are coarse, sticky and foul-smelling.

Black henbane is actually a member of the nightshade family and is on the noxious weed list for many counties in North Dakota. The large cream to yellowish flowers are very distinctive, with a tubular shape, a purple center and purple veins.

This plant is an annual but also can be a biennial with a two-year life cycle. It is toxic to all livestock as well as

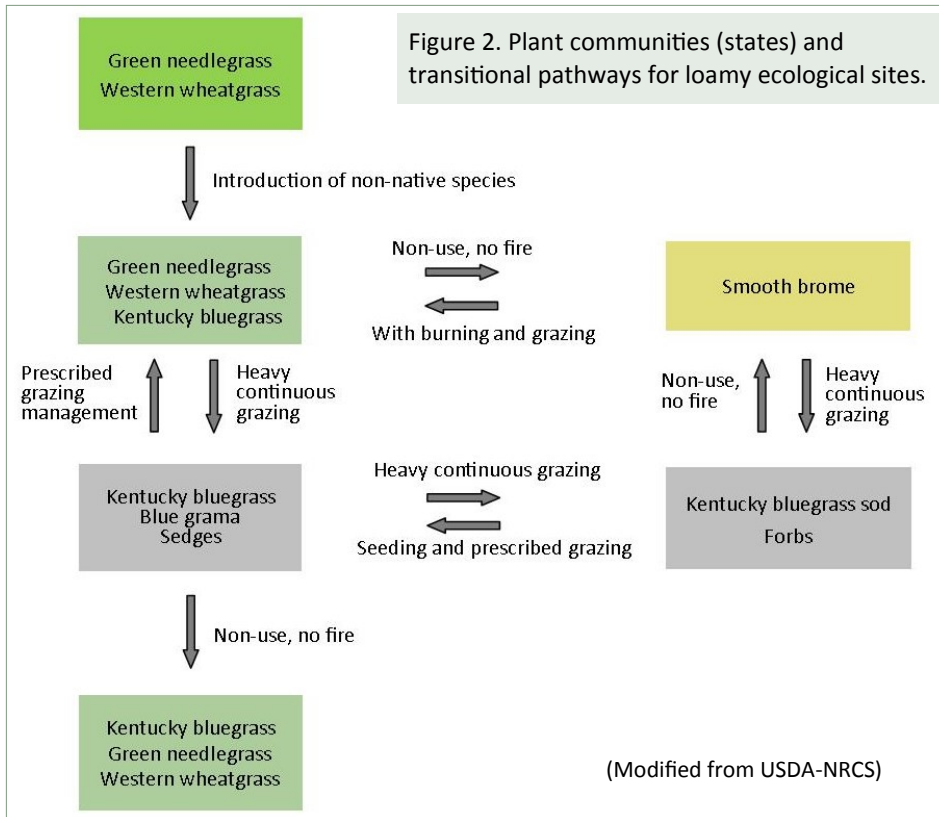
people. Avoid directly handling this plant. For more information, contact your local county Extension agent.



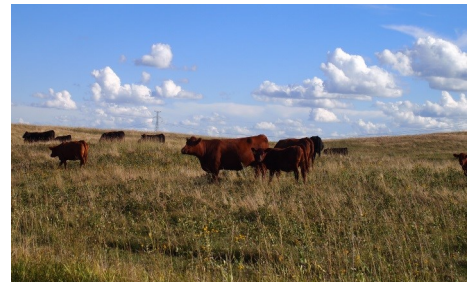
A three-foot-tall black henbane plant near a corral.

Photo by Fara Brummer

Ecological Sites and Carrying Capacity (continued from page 1)



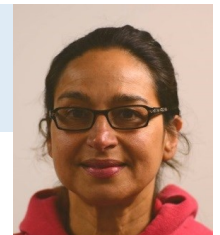
determine and improve carrying capacity and direct management. The states and their response to disturbances are described in ecological site descriptions and detailed reports prepared by the Natural Resources Conservation Service. These reports are valuable tools for developing management plans.



For more information on this topic, refer to NDSU Extension publication R1556, *Ecological Sites of North Dakota*, which is available from your local county Extension agent.

## Sunflower: A Summer Resident of the Northern Plains

Fara Brummer, Area Extension Livestock Systems Specialist, CGREC

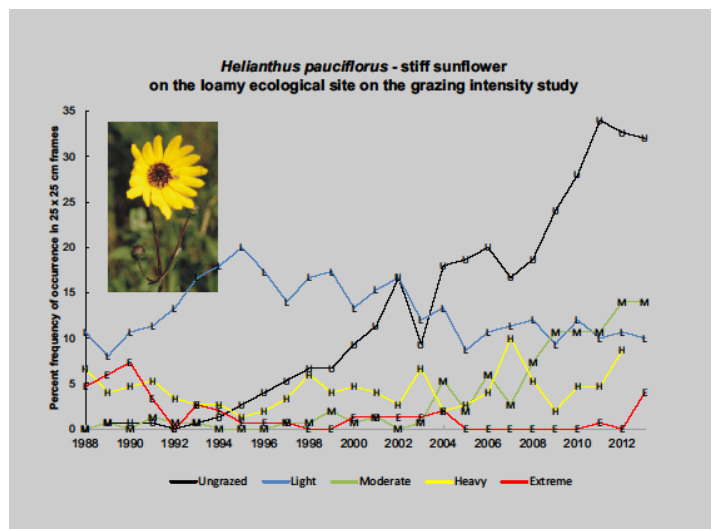


A field of sunflowers under a summer blue sky is an eye-catching sight. Sunflowers appear to follow the passage of sun as it tilts from east to west.

Sunflower (*Helianthus* sp.) is a broad name for more than 60 different species, with the majority as native species found on pastures and ranges in every region of North America. One native variety found locally and throughout the Midwest and into the East Coast is the stiff sunflower (*Helianthus pauciflorus* Nutt.). This late summer-blooming plant is perennial and may grow up to 5 feet tall. It also is rhizomatous, forming dense colonies. Research on the forage quality of sunflower species has shown healthy levels of protein and some minerals for grazing ruminant diets. This is no surprise because livestock will graze this species readily. In areas with heavy grazing pressure, it can disappear.

At the CGREC, a grazing intensity study conducted for the last 26 years has monitored plant response to beef cattle stocking rates. Range scientist Bob Patton has documented that as grazing pressure increases, the presence of stiff

sunflower decreases; however, it can be long-lived under managed livestock grazing. For information on the effects of grazing on other plant species, see the CGREC Annual Reports on our website.





### Shelterbelts for Livestock Operations

Liz Smith, North Dakota Forest Service



Properly designed windbreaks and shelterbelts can be beneficial to livestock operations on the Great Plains. Planning for shelterbelts should include their function with existing barns, lots, pastures and older shelterbelts. Trees take about 20 years to mature, so producers must consider their long-term goals, not just their immediate concerns. What also is important to recognize is that fast-growing trees can mean “fast dying,” and fast-growing trees can outcompete neighboring rows, resulting in a stunted, malformed shelterbelt. Medium or slower-growing trees used in conjunction with a board fence or portable windbreak can provide instant protection with a better overall long-term result.

investment of time and money, so choosing an appropriate site is very important.

The most effective shelterbelts utilize a variety of shrubs, small and tall trees, both evergreen and deciduous. Although no tree is pest-proof, planting a diverse mixture of species is essential to prevent future infestations from killing the entire planting.

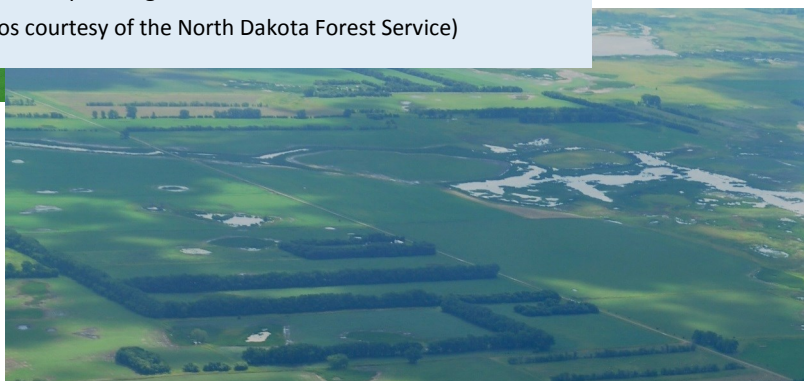
In the first few years, the new shelterbelt will require some maintenance, including weed control, supplemental watering during very dry conditions and replacement of any trees that fail to become established. Weed barrier fabric, also called fabric mulch, can improve moisture retention and reduce weed pressure. Keeping livestock from damaging the young trees also is important, and this can be accomplished with as little as a single-strand electric wire around the planting.

For more information on how shelterbelts can add value to your operation, please contact the North Dakota Forest Service, the local NDSU Extension Service office or your Soil Conservation District.



Shelterbelt plantings south of Bottineau, North Dakota.  
(Photos courtesy of the North Dakota Forest Service)

Site assessment is important for growing a healthy shelterbelt. The soil type, slope and moisture conditions are factors used to determine which trees can be used and may reveal a site that is not at all suited to planting trees. Sites near existing or former feedlots can be especially challenging due to runoff. Planting a shelterbelt will mean a significant



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## County Corner: Leafy Spurge Control With Flea Beetles

Alicia Harstad, Stutsman County Extension Agent



Leafy spurge (*Euphorbia esula* L.) is a long-lived perennial weed that can be highly invasive, and requires a combination of chemical, cultural and biological control. The most successful biological control of leafy spurge has been accomplished with flea beetles.

The first successful release and establishment of flea beetles in North Dakota was in 1988 near Valley City, and by 1996, they had become established in just about every county in the state.

Adult leafy spurge flea beetles typically emerge early to mid-June, feed on the foliage, mate and lay eggs. Adult beetles favor cool, wet conditions and typically are active for 1.5 to two months during the summer, with dry and hot conditions shortening their time span. Larvae will emerge from the eggs throughout the summer and feed on the filamentous roots and the root crown of the leafy spurge plant, where they do the most damage. Flea beetles overwinter as larvae in the soil and emerge as adults the following spring.

Leafy spurge flea beetles typically are collected for redistribution in mid-June to early July. Using the sunflower



One of the two most common species of flea beetles in North Dakota, *Aphthona lacertosa* Rosenhauer. (Photo by Rodney G. Lym, NDSU)

total accumulated growing degree days (AGDD) as a guide for beetle collection date, scouting can begin when 1,000 sunflower AGDD have accumulated.

The best time to collect flea beetles is between 10 a.m. and 3 p.m., when the temperature is greater than 70° F, and the wind is light and the sky is sunny. Once collected, flea beetles should be transported in paper bags or containers with some leafy spurge to feed on, and they should be kept cool and out of the sun. Do not use plastic containers because moisture condensation can drown the insects.

At least 1,000 beetles should be released per location for successful establishment. Establishment is considered to be successful if in the following summer, 50 or more flea beetles are collected in five sweeps.

For more information on leafy spurge biocontrol, please contact your local county Extension agent or me at (701) 252-9030.

Source: *Leafy Spurge Control Using Flea Beetles*. NDSU Extension publication W1138 (Revised), 2013.



Leafy spurge. (Photo by Fara Brummer, CGREC)

## Feed Bag Tote Bag by Sandi Dewald



To make a tote bag from a sturdy feed bag, you'll need scissors, a tape measure, a marker and a sewing machine that will sew denim-weight material with quilting or heavy-duty thread. To start, remove the bottom seam by pulling the string. Wash the outside and then turn the bag inside out and wash the inside as well. When dry, turn right side out and measure 17 inches for the body of the bag. Keep in mind where you'd like the pattern to be because you'll need 2 inches to turn under at the top and about 1½ inches at the bottom for the seam. From the remaining piece, cut across the feed bag to make two 3-inch-wide strips for the handles.

Turn the body inside out and sew a ½-inch seam across the bottom. Turn right side out and sew along the bottom, creating a stronger double seam. Measure down 2 inches around the top and mark. Fold the top over to the inside and stitch. To create the square bottom of the bag, turn the bag inside out, open up the corner and place the side fold on top of the bottom seam. Along the fold, measure about 2½ inches up from the corner and mark. Sew across, creating a triangle. Repeat for the second corner, making sure the bottom seam is turned the same way before sewing.

For the handles, overlap the 3-inch strip to about 1 inch wide and sew a seam down each side. (Strapping material such as on the totes you buy also may be used.) To attach the handles, measure 3 inches from the side of the bag, place the handle on the inside at this point, overlapping about 2 inches, and attach. (I sew two short seams from the inside and then sew an x on the top side. My machine has better top stitching.) Repeat for the other three handle ends. With a little time and patience, you should have a nice tote!



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Please join us at the

## Central Grasslands Research Extension Center Annual Field Day

Monday, July 6, 2015

- Patch burning and early intensive grazing to improve rangelands
  - Incorporating cover crops into crop rotations
- How stocking rate impacts forage intake
  - Impacts of cattle management at breeding
- Hay storage and nutrient loss
  - Alfalfa establishment

*Coffee at 9:00 a.m. Tour at 9:30 a.m. Lunch provided, starting at 12:30 p.m.*



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Photos by Rick Bohn, CGREC