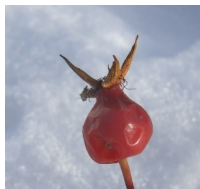


Central Grasslands Forum



NDSU Central Grasslands Research Extension Center
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Spotlight on Buckbrush

Fara Brummer, Area Extension Livestock Systems Specialist, CGREC

Buckbrush (*Symphoricarpos occidentalis*) also is known as western snowberry because of its creamy white berries in the fall. This native prairie plant often is considered a bother because of its tendency to form dense thickets. A cool-season, rhizomatous species, buckbrush can survive on many different soil types and in many regions. In fact, it is found across the U.S. except for areas in the southwest and southeast.

Buckbrush has forage value for cattle throughout the grazing season. However, cattle generally do not select it when range grasses are abundant and growing actively. Besides providing forage value to cattle, this plant is also an important browse for deer and antelope, and its berries are sought after by sharp-tailed grouse and other birds.

Buckbrush can decrease under heavy grazing pressure. Research conducted by CGREC range scientist Bob Patton

shows that buckbrush decreases significantly under early intensive cattle grazing. In comparison, little or no change in the amount of buckbrush occurs under moderate, season-long grazing.

Data from the CGREC also shows that plant crude protein levels in current year's growth can reach 27 percent in mid-May and remain above 10 percent until July. Energy levels can be also relatively high in May (Patton et al., 2000; www.ag.ndsu.edu/archive/streeter/2000report/seasonal_changes_in_forage_quality.htm).

More detailed information on grazing and its effect on plants can be found in the 2013 CGREC Annual Report at : www.ag.ndsu.edu/CentralGrasslandsREC/cgrec-annual-reports-1/2013-annual-report/2013-annual-report



Photo by Bob Patton, CGREC

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The Value of Your Hay

Fara Brummer, Area Extension Livestock Systems Specialist, CGREC

What is your hay worth for your on-ranch use or off-ranch markets? Is it a valued agricultural product? This was discussed during the talk “Hay Bale Management” at our recent NDSU Beef Cattle Winter Management workshops.

Energy is a valued part of our feedstuffs in the winter, so let us look at the cost per pound of total digestible nutrients (TDN) using three common winter feeds and a median cost for production per ton on cash rent land (Source: North Dakota Farm & Ranch Business Management Education 2013 Annual Report; State Averages).

Cost per pound of total digestible nutrients (TDN)			
TDN (%)	Corn Silage	Grass-Alfalfa	Alfalfa
50		\$0.055	\$0.068
57		\$0.048	\$0.060
63			\$0.054
68	\$0.063		

Average dry matter = 35 percent for corn silage, 88 percent for grass-alfalfa and 80 percent for alfalfa. We recommend that feed be tested for exact results.

As we can see from the table, the higher the TDN and hay quality, the more cost effective the hay product becomes. For example, 57 percent TDN reflects a very high-quality early cut grass-alfalfa hay, which is attainable with focused management. On the other hand, variables such as bale waste, moisture, quality and land rent will affect the bottom line.

Hay remains a primary winter feed for many cowherds, often being the cheapest feed to maintain adult cows through the winter. However, corn silage, which is naturally energy-rich, is very useful when animal performance - for example, the growth of calves or young breeding stock - is targeted.

How can we gain value with our hay? Reducing quality losses and waste due to outside storage are two main areas where we can gain on- and off-ranch market value.

Animal performance improves with better-quality hay. Energy and protein values of grasses and forbs are highest when plants are tender and young, and lower as they mature and lignify. Cut choices depend on maximizing forage yield and quality.

High moisture at baling time or during storage can deteriorate hay quality. Moisture above 20 percent can cause bale heating and a loss of nutrients, as well as the growth of molds.

Hay testing is critical. You really have no way to know the quality of your hay unless you test. This is important not only when you bale, but also just before you feed. Fortunately, this is affordable insurance at \$12 to \$32 per sample. For help with hay testing, your county Extension agent is a valuable resource.

One solution for reducing hay loss can be storing bales off of wet ground. Research has shown a difference of up to 5 percent less loss in nine months and up to 15 percent less loss in 1½ years with elevating bales stored outside.

Another possibility is to produce baleage, a fermented hay product that retains quality and initially is wrapped at 50 to 60 percent moisture.

Winter feed costs remain at 50 percent of the variable costs of an operation, which is double that of summertime feeding costs. Focused hay management potentially can mitigate these costs by adding more value to hay as a cost-effective and high-quality feed source.



Photo by Rick Bohn, CGREC

Importance of Soil Organic Matter on Growing-season Soil Fertility

Larry Cihacek, Associate Professor, Soil Science Department, NDSU

Soil organic matter (SOM) is critical for sustaining life on Earth. Without SOM, soils are essentially sterile and will not support plant growth adequate for acceptable pasture and crop production.

SOM improves soil structure, enhancing the soil's ability to collect and hold water and provide a suitable rooting environment for plants. SOM also improves soil health by holding and releasing nutrients to plants. In addition, it provides a food source for soil microbial populations, which in turn break down plant and animal residues and help fix and/or recycle nutrients such as nitrogen (N), phosphorus (P) and sulfur (S) that are essential for plant growth.

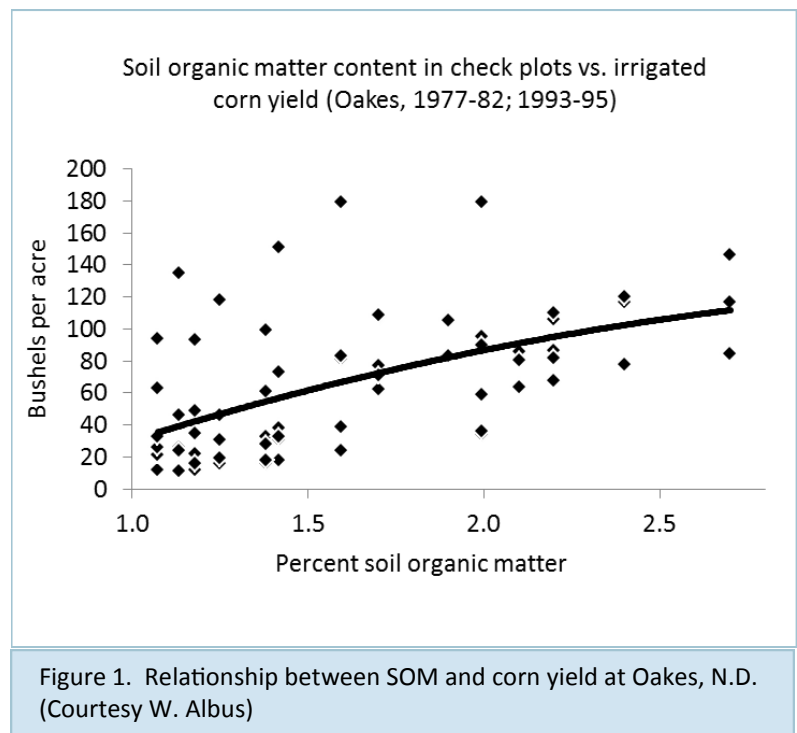
In general, soils with low organic matter are low in productivity, while soils higher in organic matter are higher in productivity. Much of this productivity is related to the ability of nutrients to cycle during the growing season.

When soil moisture is adequate, soil microbial activity is closely related to soil temperature. Thus, soil microbes are the most active when the soil temperature is the warmest. This is usually when plants are growing the fastest and require the most nutrients. Therefore, the recycling of SOM is generally highest when the plants need the most nutrients. This, in effect, is a synchronization of nutrient availability in the soil and the needs of plants, especially N, P and S.

The greatest nutrient cycling comes from the active SOM component, as well as the fresh plant residues that are returned to the soil. Improving soil productivity by increasing SOM helps sustain that productivity, which in turn helps maintain SOM.

Data from the NDSU Oakes Research Site (Figure 1) shows that under the relatively low SOM conditions at that location, an increase of 1 percent in SOM relates to an increase in corn grain yield of nearly 49 bushels/acre.

Although the environment in other parts of North Dakota may be different than at Oakes, SOM levels are similar across large areas of the state. The effect of improving SOM levels will be lower in drier areas of North Dakota, but still significant, and may help reduce the need for additional fertilizer for a crop.



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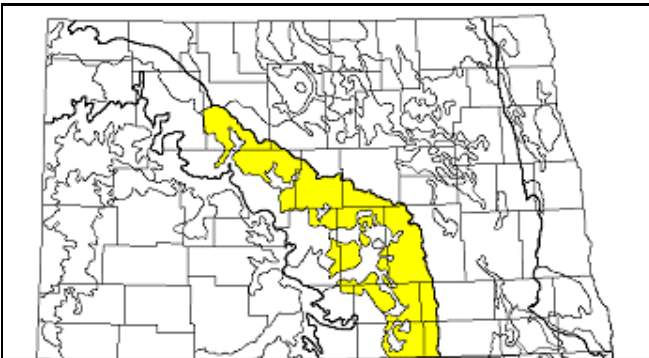
The Role of Glaciers in Shaping North Dakota

Janet Patton, Research Assistant, CGREC

The landscape of much of North Dakota was shaped by glaciers. This is evident when crossing North Dakota from east to west.

Starting at the Red River in the Glacial Lake Agassiz Plain, you cross the Drift Plains and then climb the 300- to 500-foot rise of the Missouri Escarpment to the Missouri Coteau, a region of rolling hills. Continuing west, the terrain drops down the Missouri Coteau Slope to the Missouri River.

The Central Grasslands Research Extension Center is on the western edge of the Missouri Coteau.



This map shows the Missouri Coteau in North Dakota. The Northern Missouri Coteau extends through Mountrail, Burke and Divide counties. From: Bryce, S., J.M. Omernik, D.E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S.H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/index.htm> (Version 30NOV1998).

The word “coteau” is French for “little hills.” The uplands of the Coteau are made of thick glacial till and run from Saskatchewan, Canada, to South Dakota, including parts of 16 counties in North Dakota. These interesting landforms are dotted with wetlands and were created along the southern margins of several glaciers, the last one being present 12,000 years ago.

The glaciers were sheets of ice sometimes thousands of feet thick. Flowing southward, they picked up soil and rocks, reworking this material as they moved. When the climate warmed and the glaciers began to melt, ice continued to flow from the north, but the glacial margin became stationary, and huge amounts of glacial till were deposited along this margin.

As the ice continued to melt, the layers of debris slumped unevenly, forming hills and valleys. In some areas, the insulating material over the ice was so thick that buried ice still remained after 3,000 years. Due to the uneven sedimentation and depressions left by ice blocks, the Coteau has a large number of semi-permanent wetlands, or sloughs; in some areas, it has more than 100 sloughs per square mile.

The Missouri Coteau formation is geologically recent and has been little modified by weather or erosion; therefore, soil permeability is low. A unique feature of the Coteau is its lack of a well-integrated drainage system, which means an absence of streams in this area.

Potholes and wetlands can hold large volumes of water and release it slowly through seepage. Highland basins are groundwater recharge areas that release water. Flow-through basins, the most common, collect and release groundwater. Lower basins are discharge areas. They collect water and lose it only by evaporation, thus becoming saline.

Glacial till forms rich soil, but due to the unsorted mixture of clay, silt, sand and rocks, some areas of the Missouri Coteau are difficult to farm and have been used as pasture and hayland. The soils and hydrology of the Missouri Coteau are reflected in the varied patterns of land use, with rangeland interspersed with cropland, wetlands and sloughs. The mighty work of the glaciers is still evident in the mosaic pattern of the landscape we see today.



Photo by Rick Bohn, CGREC

Sources:

Bluemle, J.P. The Face of North Dakota. 3rd ed. Educational Series 26. North Dakota Geological Survey, 2000.

Sloan, C.E. 1972. Ground-Water Hydrology of Prairie Potholes in North Dakota. U.S. Geological Survey Professional Paper 585-C. <http://library.ndsu.edu/exhibits/text/potholes/585c.html>

Herdsmen Cody Molle Celebrates 1 Year at CGREC

Fara Brummer, Area Extension Livestock Systems Specialist, CGREC



Cody Molle, beef cattle management specialist, joined the CGREC a year ago from his home base of Torrington, Wyo. His passion for working with cattle is evident when you visit with him and see him out in the field sorting cattle, doctoring cows and calves, and breeding heifers and cows with artificial insemination (AI).

Molle has a wealth of experience in the world of cattle production, starting with a personal herd of 200 mother cows and progressing to his own AI business, in which he ranch-bred 4,000 to 6,000 head of heifers annually. Along the way, he collected his bachelor of science degree in agricultural economics through a rodeo scholarship.

Molle was superintendent of the Veterinary Laboratory at the University of Wyoming in Laramie for 11 years.

His work travels took him to the Montana State University Research Center in Miles City, where he managed six herds of research cattle totaling 1,800 head. After that, he ran the Animal Nutrition Lab at the University of Wyoming in Laramie for four years, giving him firsthand experience with feed testing and analysis.

Here at the CGREC, Molle is never very far from the cattle. In his free time, he enjoys hunting and fishing, and spending time with his two dogs, Kris and Max. The Central Grasslands REC is fortunate to have Cody in our midst, and we can be assured the cattle are in good hands.



Photo by Bryan Neville, CGREC



County Corner: New Pest Moving Our Way

Sheldon Gerhardt, Logan County Extension Agent

Many counties in the state have been experiencing herbicide weed resistance, which appears to move up through the Red River Valley and follow the increasing acres in corn and soybeans. However, a new pest is on the horizon and is following a similar pattern with soybeans. But this time, it is in the soil.

Soybean cyst nematode (SCN) first was found in Richland County in 2003 and since has been confirmed in a dozen counties in North Dakota. It also is suspect in other counties. That is why the North Dakota Soybean Council sponsored a soil testing program this summer.

SCN is a microscopic parasitic worm that thrives on soybean roots. It is difficult to detect because it can cause 15 to 30 percent crop yield losses before you see any above-ground symptoms. Those symptoms include stunting and yellowing of plants during the end of the season (August or later). However, diagnosis is difficult because these symptoms can be caused by other issues as well.

The two primary ways to detect SCN are through soil testing and by examining roots of the plant, with soil testing being the most reliable method. Examining roots for cysts (in photo) is tricky because the cysts fall off the plants easily.

SCN can be managed if detected early. Proactive management strategies include crop rotations and nematicide seed treatments, which are available on the market. Resistant soybean varieties also are being bred and tested.

Soybean growers need to be aware that if left unchecked in soil populations, SCN can cause yield losses for years. Keep an eye out for the Soybean Council's results from the soil testing program to see how close SCN is to your farm or contact me at (701) 754-2504 for local results.



From *Atlas on Ultrastructure of Infective Juveniles of the Soybean Cyst Nematode, Heterodera glycines* by Burton Y. Endo, USDA-ARS, 1998.

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Upcoming Events at CGREC:

Getting it Right in Soybean Production

Tuesday, Jan. 13, from 10 a.m. to 3 p.m.

For soybean producers interested in intensive soybean management. North Dakota State University Extension faculty and staff will discuss soybean research and 2015 production issues.

Buying Bulls by the Numbers

Thursday, Jan. 22, from 1 to 3 p.m.

An interactive and hands-on workshop for spring bull buying. Please bring past, current and prospective sire registration numbers along with catalogs from prospective bull producers.

Baleage: An Option for Rainy Day Haymaking

Tuesday, March 3, from 1 to 3 p.m.

Options for maximizing hay quality will be discussed in this two-hour video-conference. This will include baleage as well as the use of preservatives.



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