



Fall/Winter 2023

Morton County Soil Conservation District

Conservation News

Area IV Farm Research: The Complexities of Cropland Conservation

It ain't easy, but somebody's got to do it:
The complexities of cropland conservation

A more sustainable agriculture means cropping systems that boost production while achieving useful economic, social, and environmental outcomes. This is a challenge because these outcomes interact in complex ways.

Documenting and understanding the relationship among these outcomes are a big part of what we do at the **Area IV SCD Cooperative Research Farm**.

Recently the Area 4 team completed a three-year study on how conservation practices affect soil health. The study evaluated four management strategies and their effects on six soil functions. Study sites were located at the USDA-ARS Northern Great Plains Research Laboratory and on farms in Emmons County, all on a Tenvik-Wilton silt loam soil.

The findings were straightforward for some management practices, but complex for others (Figure 1). **Perennial systems** showed consistent positive effects on all soil functions, while **cover crop** effects were neither universally positive nor negative. **Grazing cattle on cropland** meant reduced water infiltration but increased nutrient cycling.

One clearly useful strategy for the Northern Great Plains soil was **diverse, continuous crop rotations**. Diverse crop rotations improved soil structure and biological habitat but had mixed effects on nutrient supply and climate regulation due to excess soil nitrate and increased acidification. Livestock integration onto cropland was also complex. While improving the nutrient supply potential and biological habitat, the presence of livestock impacted the infiltration rate of water, having a negative impact on water cycling.

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Management Strategy

Soil Function	Crop diversity		Cover crops		Cropland grazing		Perennials	
	High	Low	Yes	No	Grazed	Ungrazed	With	Without
Water cycling	No Difference		No Difference		👎	👍	👍	👎
Structural maintenance	👍	👎	No Difference		No Difference		👍	👎
Nutrient supply	MIXED OUTCOME		No Difference		👍	👎	👍	👎
Nutrient cycling	No Difference		No Difference		No Difference		👍	👎
Biological habitat	👍	👎	No Difference		👍	👎	👍	👎
Climate regulation	MIXED OUTCOME		No Difference		No Difference		👍	👎

Figure 1. Outcomes from four management practices on six soil functions.

We gathered a lot of data, but it all comes down to **two recommendations** for Northern Great Plains agriculture.

First, promoting and maintaining perennial agricultural systems should be a priority. All soil functions in perennial systems were stronger: better cycling of water and nutrients, better biological habitat, and better resistance to climate impact. This means that important agricultural and environmental outcomes are lost when grazing lands or perennial pastures are converted to cropland.


Second, among dryland cropping systems, diverse continuous cropping practices should be encouraged: it improves soil structure, increases nitrogen mineralization, and enhances biological habitat. If paired up with more efficient nitrogen management, this should reduce soil degradation and negative environmental impacts on the water and soil. This means diverse crop rotations can be good for both production and the bottom line.

We also learned that we have more to learn. We are looking into how long-term use of cover crops affect grain yield, drought resilience, and soil health. We'll let you know what we find out.

This is why we do research at Area 4: to understand the long-term impact of operational decisions and share them so you can increase your bottom line, sustain your operation, and preserve your family's well-being.


Additional information about the study can be found at <https://doi.org/10.1002/saj2.20375>

If you have questions or would like more information, please contact Technical information specialist Seth.Archer@usda.gov or Soil scientist Mark.Liebig@usda.gov

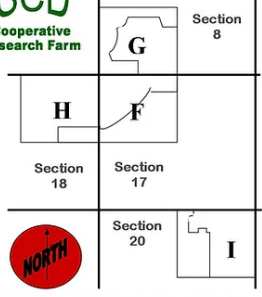


AREA 4 SCD
Cooperative Research Farm

Cooperative Research Farm
Area IV Soil Conservation Districts*
USDA-Agricultural Research Service
Founded 1983



Northern Great Plains Research Laboratory



Developing Sustainable Food production Systems

- ✓ Long-Term Agro-Ecosystem Research
- ✓ Carbon and Nitrogen Cycling
- ✓ Dynamic Cropping Systems
- ✓ Production Economics
- ✓ Water Use Efficiency
- ✓ Cover Crops
- ✓ Soil Quality

*McIntosh County SCD, Burleigh County SCD, Oliver County SCD, West McLean County SCD, Stutsman County SCD, Emmons County SCD, Sheridan County SCD, Morton County SCD, Cedar SCD, Kidder County SCD, South McLean County SCD, & Logan County SCD

www.mandan.ars.usda.gov 701.667.3000 or 3001

Gather Around the Table

A recipe from our District Clerk, Malissa McKee

We are approaching the holidays! I personally have always enjoyed having some cranberry sauce with my turkey. This past year I finally took on making cranberry sauce from scratch! Not only was it tasty, but the house smelled so good! Leftovers are great on ice cream too!

Homemade Cranberry Sauce

- 1 cup granulated sugar
- 1/2 cup water
- 1/2 cup orange juice
- 12 ounces fresh or frozen cranberries
- 1 teaspoon orange zest
- 1 cinnamon stick
- 1/8 teaspoon ground cloves



Combine sugar, water, and juice in a 12 inch saucepan. Bring mixture to a boil.

Add cranberries, orange zest, cinnamon stick, and cloves. Heat over medium until the sauce returns to a boil.

Reduce heat to medium-low and simmer for about 20 minutes or until the sauce thickens and turns deep red. The sauce will thicken further as it cools, so remove from heat as the sauce is approaching jam consistency.

Remove from heat and cool cranberry sauce. Remove and discard the cinnamon stick.

Transfer to an airtight container and place in the refrigerator to cool completely.

****I kept the sauce on low in a small crockpot and served it warm! I also used honey instead of granulated sugar**

Tree of the quarter—Russian Olive

(*Elaeagnus angustifolia*)

The Russian Olive is a small tree, sometimes referred to as a large shrub. This may invade unmanaged bottomlands and moist pastures. Leaves maintain into very late fall. Characteristics of thorny, with silvery leaf color. The largest tree in North Dakota is 43' tall with a canopy spread of 63.'

Bud size is 1/8" with leaf simple, oblong-lanceolate to linear and scaly surface. Leaves are 1-3" in length and 1/4" to 5/8" in width.

Branches are random and spreading, starting at the base of the trunk. Crown height is 15-25' with crown width of 12-25'. Bark when young will appear silvery, older has a bronzy-brown appearance. Fibrous root system.

Adapts to a wide variety of soils, tolerating alkaline and saline soils. Drought resistant. Does not withstand ponding. Utilized for farmstead and field windbreaks. The seed is spread by birds and may overrun unmanaged areas, especially saline sites.

Excellent for wildlife, over 50 species use it for food and cover. Flower color is silvery or whitish outside, yellow inside and fragrant. Fruits are drupe like and 1/4" long and pulpy. Fruit appears yellow inside and coated with silvery scales.



It's Time to Pre-Order!

District Technician, Ethan Gress

It is time to get your handplant preorders in. We have included a copy of the order form along with this newsletter. We offer many different varieties of shrub, deciduous, and coniferous trees. Along with the conservation grade bareroot trees we have a few varieties in larger sizes. We hope to have something for everyone. I would like to explain the process of these orders from both the side of the producer as well as the Soil Conservation District.

As previously stated, we are sending out a copy of the order form along with this newsletter. With this order form, you are able to select all the trees that you are looking to purchase and preorder them. Keep in mind that this is a *preorder*, meaning that you will receive your trees at a later date. We hope to host our Handplant Order Pickup around the start of May. This date depends on when we are able to get the trees from the nurseries and weather has had the biggest impact on this in the past. For example, the last two years we only received our order of trees from the nurseries in the middle of May. The long-lasting winters have pushed us back. We plan on sending out a post card ahead of the pickup date to let everyone know when they can come get their trees. Please include with your order a current mailing address so that we may reach you accordingly.

On the other hand, we start ordering trees for our tree plantings as well as for the handplant orders as soon as we can. We tend to place orders to the nurseries as early as September and through the end of the year. Throughout the time between ordering and going to get the trees, the nurseries may let us know that they are unable to fill a certain species due to not having enough stock. This has happened in the past but is not common. If this happens then we will try to find the stock from another nursery so that we will have enough for our plantings as well as the handplant pre-orders. Unfortunately, sometimes we are unable to find any extra stock and will have to inform you that we will not have some of the trees that you ordered.

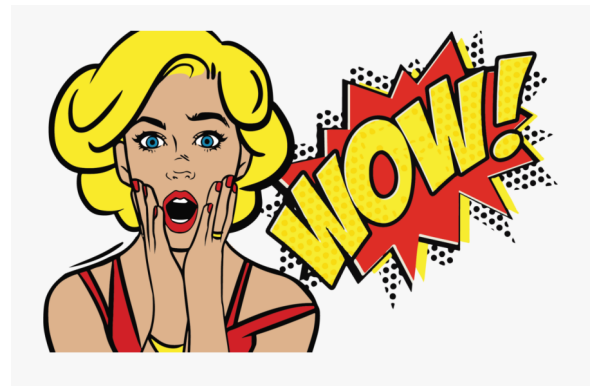
My hope is this helps everyone understand the processes of tree ordering, both on your end and on ours. Make sure to get your orders in as soon as possible, and feel free to give us a call if you have any questions. Thanks for reading!



What do they mean?!

Acronyms in Agriculture & Conservation

USDA—United States Department of Agriculture
ARS—Agriculture Research Service
FSA—Farm Service Agency
NRCS—Natural Resources Conservation Service
SCD—Soil Conservation District
FO—Field Office
DEQ—Department of Environment Quality
SSCC—State Soil Conservation Committee
NACD—National Association of Conservation Districts
NDASCD—North Dakota Association of Soil Conservation Districts
NWQI—National Water Quality Initiative
EQIP—Environmental Quality Incentives Program
CRP—Conservation Reserve Program
CSP—Conservation Stewardship Program
CREP—Conservation Reserve Enhancement Program
ARC/PLC—Agriculture Risk Coverage and Price Loss Coverage
LIP—Livestock Indemnity Program
LFP—Livestock Forage Program
578—Acreage reporting form



Grazing Plans—what they are and how the process works

-Watershed Coordinator, Chance Porsborg

Howdy Everyone! There is a lot of moisture this year, which means there is a lot of grass to graze in the pasture. What better way to compliment that than with a prescribed grazing plan. A grazing plan is a management tool to help obtain the proper utilization of a pasture, while still giving the adequate rest period for regrowth to occur. This is a service provided by the Morton County Soil Conservation District (MCSCD), and the NRCS at no cost to you!

There are a few steps to accomplish prior to the implementation of a prescribed grazing plan. Starting with our range and pasture planning checklist. The top of this list starts with maps of the acres involved and to meet with you, the producer, to get an inventory of what is located within that area. This may include locations of fences, water developments, erosional and heavy use areas, and usable power if necessary. If there is nothing else that would need to be included for the practice, we can move forward with the next step.

A vegetative inventory is the next step in the prescribed grazing process. This requires the MCSCD and or the NRCS employees to go out and do a rangeland health assessment/ pasture condition score. Throughout these assessments, there are several things that are evaluated such as soil types, grass species, and noxious/ invasive species. After this has been completed, there are grass clippings taken from the area, which are then weighed, dried, and weighed again to give us a dry weight. This measurement is then entered into a spreadsheet that computes how many days the livestock can be in each pasture.

The next part of this process is establishing how many livestock are going to be running in this grazing plan. Not just how many, but also the average weight, if there are multiple herds, and when a producers “normal” grazing window is. Whether it is April – August or if it is June – October, this will then be entered into the spreadsheet. The spreadsheet will compute how many days the herd, or herds, can be grazing in each pasture while still staying on the producer’s “normal” grazing window. Once this is accomplished, there is a meeting scheduled with you, the producer, to sit down and discuss what pasture you would like to start grazing. From there it can be established which pastures to rotate into next, until the end of the grazing season.



Sheep Fact: Not only is wool great for clothing, but it also has some industrial uses ranging from piano dampers to absorbent pads to help clean up those baaaad oil spills.



2024 Hand Plant and Replacement Tree Order Form

Name: _____ Date: _____

Address: _____ City: _____ Zip: _____

Phone number: _____ Sold By: _____

Shrubs – Conservation Grade \$3.00

_____ Almond, Russian	_____ Dogwood, Redosier	_____ Silverberry
_____ Buffaloberry	_____ Elderberry	_____ Sumac, Skunkbush
_____ Caragana	_____ Honeysuckle, Hawkeye	_____ Sumac Smooth
_____ Cherry, Nanking	_____ Honeysuckle, Tatarian	_____ Willow, Sandbar
_____ Cherry, Sand	_____ Indigo, False	_____ Winterberry
_____ Chokeberry, Black	_____ Juneberry	
_____ Chokecherry, Common	_____ Lilac, Common	
_____ Chokecherry, Schubert	_____ Lilac, Villosa	
_____ Cotoneaster, Centennial	_____ Plum, American	
_____ Currant, Black	_____ Plum, Bounty	
_____ Currant, Golden	_____ Plum, Red Prairie	

Deciduous Trees – Conservation Grade \$3.00

_____ Apricot, Hardy	_____ Crabapple, Siberian	_____ Pear, 'Mcdermand' Usserian
_____ Ash, Green	_____ Elm, American	_____ Poplar, Hybrid
_____ Aspen, Quaking	_____ Elm, Siberian	_____ Willow, Golden
_____ Birch, River	_____ Hackberry, Northern	_____ Willow, Laurel
_____ Boxelder	_____ Hawthorne, Arnold	_____ Willow, Peachleaf
_____ Buckeye, Ohio	_____ Hawthorn, Roundleaf	
_____ Catalpa, Northern	_____ Hickory, Shagbark	
_____ Cherry, Black	_____ Honeylocust, Thornless	
_____ Chokecherry, Amur	_____ Linden, American	
_____ Cottonwood, Native	_____ Linden, Little Leaf	
_____ Cottonwood, Silver	_____ Maple, Amur	
_____ Cottonwood, Siouxland	_____ Maple, N. Sugar	
_____ Crabapple, Dolgo	_____ Maple, Silver	
_____ Crabapple, Midwest Man.	_____ Oak, Bur	
_____ Crabapple, Red Splendor	_____ Olive, Russian	

Vines – Conservation Grade \$3.00

_____ Grape, Riverbank

Conifers – Conservation Grade \$3.00

_____ Cedar, Eastern Red	_____ Pine, Scotch	_____ Spruce, Meyer
_____ Juniper, Rocky Mountain	_____ Spruce, Black Hills	_____ Spruce, Norway
_____ Pine, Ponderosa	_____ Spruce, Colorado Blue	_____ Pine, Austrian

Container Grown Plugs \$3.50**Purchase in quantities of 10x only**

_____ Aspen, Quaking	_____ Pine, Scotch	_____ Cedar, Eastern Red
_____ Larch Siberian	_____ Spruce, Black Hills	_____ Spruce, Colorado Blue
_____ Fir, Douglas	_____ Juneberry	_____ Pine, Ponderosa

2-3' Trees \$3.75

_____ Ash, Green	_____ Cottonwood, Native	_____ Oak, Bur
_____ Cherry, Nanking	_____ Cottonwood, 'Siouxland'	_____ Chokecherry, Common
_____ Plum, American	_____ Poplars, Hybrid	

3'+ Trees \$5.75

_____ Ash, Green	_____ Cottonwood, Native	_____ Lilac, Common
_____ Cottonwood, Male	_____ Cottonwood, 'Siouxland'	_____ Poplars, Hybrid

1 Gallon Conifer Pots \$15.00

_____ Fir, Douglas	_____ Pine, Ponderosa	_____ Spruce, Colorado Blue
_____ Juniper, Rocky Mountain	_____ Spruce, Black Hills	_____ Spruce, Meyer
_____ Pine, Scotch	_____ Pine, Austrian	_____ Spruce, Norway
_____ Larch, Siberian		

Also available

_____ 4"x4" fabric squares	\$2.50
_____ 6'x300' fabric roll	\$120
_____ 6'x500' fabric roll	\$200
_____ staples	\$0.30/each
_____ box of staples	\$125

Plantskydd

_____ 1 lb shaker	\$12.95
_____ 3 lb shaker	\$26.95
_____ 3.5 lb powder	
_____ concentrate	\$29.95
_____ 1 qt spray	\$21.95

*Please note, this form is for hand plant and replacement trees **only**. If you would like to plan a machine planting, please contact our office at 701-667-1163 extension 3

*Please **do not** send payment with your order form. A bill will be sent to you for a 40% down payment. Thank you!

Farmer (tax exempt) _____ **Non-Farmer** _____
Required for all tree orders (Sales Tax Purposes)

Signature _____
For information visit our website: www.mcscd.com

Please return to: Morton County SCD
2540 Overlook Lane
Mandan, ND 58554

Return by December 31, 2023

Chief Cosby Visits North Dakota



Chief Terry Cosby with NRCS North Dakota State Conservationist, Dan Hovland



Chief Terry Cosby visited the NRCS North Dakota State Office on July 17th.

Regional Partner Updates

Did you know ?!

North Dakota has been in the national spot light this year with multiple agriculture related conferences and site visits from US Capital leadership!

NRCS Chief Terry Cosby visited the NRCS State office in July, along with attendance at the National Association of Conservation Districts Conference in Bismarck. This conference also included a tour at Menoken Farms and a dinner at Black Leg Ranch.

The National Cooperative Soil Survey Conference was also held in the Bismarck area, at BSC. This conference also included a site visit at the Area IV Research Farm located in Mandan.

2023 National Cooperative Soil Survey Conference

*Submitted by Wade Bott
State Soil Scientist, Bismarck SO*

The 2023 National Cooperative Soil Survey (NCSS) Conference was held in Bismarck, ND July 9 – 13, 2023 at the Bismarck State College National Energy Center of Excellence overlooking the Missouri River. Hosted by North Dakota State University and NRCS North Dakota. The event co-chairs were Dr. David Hopkins, NDSU, and Wade Bott, ND State Soil Scientist. Susan Samson-Liebig, ND Soil Quality Specialist and Lance Duey, ND Assistant State Soil Scientist made up the remainder of the local planning group.

The conference delegation explored a wide range of topics related to the "Soil, Energy, and Agriculture for Resilient Ecosystems" theme; including, but not limited to, the interface between energy and agriculture, climate, carbon measurement and sequestration, dynamic soil survey, climate smart agriculture, and soil health throughout the week.

Sunday featured a fabulous field trip across ND's sedimentary plains with a stop near Belfield to investigate sodium affected soils, lunch on the Tjaden Terrace near Medora, and a short



Local Planning Group: Susan Samson-Liebig, Wade Bott, Hopkins, and Lance Duey.

cruise into Theodore Roosevelt National Park all accompanied by Dr. Bernhard Saini-Eidukat's geologic narratives for the area.



Dr. Hopkins guides folks at the moderately deep Sen site.



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■ Capital Credit Union	Gartner Seed Farm	Starion Bank
■ Chesak Seed House	Hirsch Florist	West River Telecomm
■ Comfort Inn & Suites of Mandan	L&H Manufacturing	
■ Dakota Community Bank	ND Farm Bureau	

UPCOMING EVENTS:

MCSCD Board meeting are generally the 2nd Thursday of the month & are open to the public. Check Facebook for dates and time.

October:

6th—Area IV SCD meeting, Washburn 4H Camp
9th—Indigenous Peoples Day, Offices Closed
11th—Lewis & Clark Envirothon, Washburn 4H Camp
12th—Morton County SCD Board Meeting, Mandan FO

November:

1st-3rd—Northern Plains Region NCDEA Workshop,
Deadwood SD; SCD staff attending
13th-15th—NDASCD Annual Convention, Bismarck Hotel &
Convention Center
23rd—Thanksgiving, Offices Closed

December:

5th-8th—TREES program, Morton County Schools
25th—Christmas, Offices Closed

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