Minnesota Soil Health Resources

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NRCS State Agronomist

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Midwest Cover Crops Council

- Minnesota Website: http://www.mccc.msu.edu/states/minnesota.html
- Cover Crop Decision Tool: http://mcccdev.anr.msu.edu/VertIndex.php

Minnesota Board of Water and Soil Resources (BWSR)

- Website: http://www.bwsr.state.mn.us/

Minnesota Department of Agriculture (MDA)

- Website: http://www.mda.state.mn.us/
- Conservation Funding Guide: http://www.mda.state.mn.us/protecting/conservation/funding.aspx
- Cover Crops: http://www.mda.state.mn.us/protecting/conservation/covercrops.aspx

Minnesota Soil and Water Conservation Districts (SWCD)

- Website of Counties: http://www.maswcd.org/SWCDs_On_The_Web/swcds_on_the_web.htm

Natural Resources Conservation Service (NRCS)

- Minnesota NRCS Website: http://www.mn.nrcs.usda.gov/
- Soil Quality Website: http://soils.usda.gov/sqi
- Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
- NRCS Minnesota Programs: http://www.mn.nrcs.usda.gov/programs/

United States Department of Agriculture-Agricultural Research Service (USDA-ARS)

Minnesota Soil Quality Contact: Sharon.Weyers@ars.usda.gov

- **Morris**: North Central Soil Conservation Research Lab http://www.ars.usda.gov/mwa/ncscrl
- **St. Paul**: Soil and Water Research Management Unit http://www.ars.usda.gov/mwa/stpaul/swrmu

Iowa Soil Quality Contact: Cindy.Cambardella@ars.usda.gov

- **Ames:** National Laboratory for Agriculture and the Environment http://www.ars.usda.gov/mwa/ames/nlae
  - Soil, Water, and Air Resources Unit
  - Agro ecosystems Management Research Unit

South Dakota Soil Quality Contact: Michael.Lehman@ars.usda.gov

- **Brookings**: North Central Agricultural Research Laboratory http://www.ars.usda.gov/npa/ncarl

North Dakota Soil Quality Contact: Kristine.Nichols@ars.usda.gov

- **Mandan**: Northern Great Plains Research Laboratory http://www.ars.usda.gov/npa/ngprl

University of Minnesota (UMN)

- Department of Soil, Water, and Climate: http://www.swac.umn.edu
- Research Analytical Laboratory: http://ral.cfans.umn.edu/
- Soil Testing Laboratory: http://soiltest.cfans.umn.edu/

University of Minnesota Extension Service (UMES)

- Agriculture Website: http://www1.extension.umn.edu/agriculture/

Soil Health

- Synergistic Effects of conservation practices implemented as a system
- Partnership
- Challenges

Synergistic Effects of conservation practices implemented as a system

- Use multiple practices in combination
- Result in environmental improvements
- Systems result in economic benefits
- Your tillage, irrigation, and runoff management decisions can protect your land and result in healthy soils to produce high quality and yielding crops.
- Conservation tillage system
- Contour farming

Synergistic Effects of conservation practices implemented as a system

- Reduce soil disturbance, soil compaction, and soil crusting will increase soil biota and provide better rooting depth creating an overall improvement in soil quality
- Promote soil organic matter from crop residues
- Improved soil structure, increase in organic matter, and reduced erosion will increase water infiltration into the soil thus reducing runoff
- More soil water equates to more available water for plant use

Synergistic Effects of conservation practices implemented as a system

- Low pressure application of irrigation water (to mimic natural rainfall) = reduced irrigation inputs.
- Soil and water management
- Recommended rate and timing of nutrient applications
- Higher yielding crops
- Increased crop residues for continued soil protection
- Improved nutrient cycling in the soil
- All of which improve the foundation of your farming operation….Your Soil.

Minnesota Agencies

- Minnesota Conservation Partnership working with farmers

Natural Resources Conservation Service (NRCS)

- NRCS offers technical and financial assistance to help farmers use conservation practices and systems on cropland.
  - Environmental Quality Incentives Program (EQIP)
  - Conservation Stewardship Program (CSP)
- Minnesota NRCS Website
  - http://www.mn.nrcs.usda.gov/
- Soil Quality/Soil Health Website
  - http://soils.usda.gov/sqi/
- Web Soil Survey
  - http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm


NRCS
Soil Quality
A foundation for cropland health and productivity
The soil works for you...
Soil quality affects:
Organic matter
Soil tilth
Crop productivity
Cation exchange
pH
Erosion potential
Infiltration
Compaction
Available water
Short-term drought tolerance
Wildlife habitat
Air quality
Water quality
...If you work for the soil
To improve soil function and cropland health:
Plant high residue crops
Double crop or use cover crops
Add legumes and grasses to your rotation
Practice rotational grazing
Adopt no-till or strip tillage
Keep the ground covered with residue
Manage nutrients efficiently
Avoid driving on wet soil
Monitor soil quality and vegetation
soils.usda.gov/sqi


NRCS
Soil Quality
A foundation for pastureland health and productivity
What are you doing to the soil?
To protect soil function and pasture condition:
Maintain vigorous cover on the soil
Increase or maintain plant production
Practice rotational grazing to promote root growth and for uniform manure distribution
Minimize grazing traffic when the soil is wet
Maintain pH for desirable plants
Control weeds to protect desirable plants
Assess and monitor soil quality and vegetation for early indications of changes in soil function and pastureland condition
What is the soil doing for you?
Pastureland soil quality affects:
Plant production
Plant reproduction
Plant mortality
Erosion potential
Vegetation composition
Water availability
Water quality
Wildlife habitat
Carbon sequestration
soils.usda.gov/sqi


NRCS
Soil Quality
The Foundation of Air and Water Quality
"The nation that destroys its soil destroys itself."
– Franklin D. Roosevelt
To enhance soil organic matter, use:
• Cover crops
• Crop rotations
• Reduced tillage
• Rotational grazing
Productivity
Soil functions
Organic matter
and other soil properties

USDA Agricultural Research Service (ARS)

- **Minnesota**
  - North Central Soil Conservation Research Lab-Morris http://www.ars.usda.gov/mwa/ncscrl
    - Mission is to enhance productive conservation of agricultural and natural resources base, improve environmental health, and contribute to national food security through diversified, competitive, and resilient agro-ecosystems in the upper Midwest.
  - Soil and Water Research Management Unit—St. Paul http://www.ars.usda.gov/mwa/stpaul/swrmu
    - Mission is to develop and test agricultural management practices that improve water quality and soils and reduce emissions of greenhouse gases.

USDA Agricultural Research Service (ARS)

- **Iowa**
  - National Laboratory for Agriculture and the Environment—Ames

    http://www.ars.usda.gov/mwa/ames/nlae
    - Mission is to generate information which addresses critical problems in agriculture and watershed management leading to the development of innovative solutions which increase the efficiency of agriculture systems and reduce environmental risk.
      - Soil, Water and Air Resources Unit
      - Agroecosystems Management Research Unit

USDA Agricultural Research Service (ARS)

- **South Dakota**
  - North Central Agricultural Research Laboratory—Brookings http://www.ars.usda.gov/npa/ncarl
    - Mission is to incorporate ecological principles into integrated pest and crop management systems to improve the long-term resiliency and profitability of food production.
- **North Dakota**
  - Northern Great Plains Research Laboratory—Mandan http://www.ars.usda.gov/npa/ngprl
    - Mission is to develop environmentally sound practices and add value to agricultural systems in the Great Plains in terms of food, feed, and biomass by conducting team-focused, systems-oriented research and technology transfer.

University of Minnesota

- Research focus on Soil Quality/Health under different cropping systems
- Providing workshops
- Research Analytical Laboratory/UMN Soils Lab
  - Provides analysis of soils to university researchers, government agencies, public service groups, and producers.
  - Adding measures of soil quality to list of services
    - Aggregate stability, particulate organic matter, microbial biomass, and mineralizable C and N
    - Contact Keith Piotrowski (kpiotr@umn.edu) if interested in these testing procedures

University of Minnesota Extension

- Education, research, and outreach along with demonstration acres
  - Cover Crops
  - Reduced Tillage and Equipment
  - Many more….
- Extension Educators are available to answer questions regarding the many aspects of soil health.

Minnesota Department of Ag (MDA)

- Cover Crops
- Rain Simulator
- Nutrient Management
- Conservation Funding Guide

Minnesota Department of Ag (MDA)

MDA Conservation Funding Guide

Cover Crops Assistance: Side-by-Side Comparison of Programs				
AgBMP Loan Program	Conservation Stewardship Program (CSP)	Environmental Quality Incentives Program (EQIP)	Local & Regional Programs	Other Programs
Cover Crops Loan: In counties where Cover Crops qualify for AgBMP Loans and funds are available, the loan has a 3% interest rate and helps finance the purchase of supplies and services needed to establish Cover Crops, including the purchase or rental of specialized equipment. AgBMP loans may be combined with incentive or cost share payments from other programs. AgBMP loan applications are typically accepted year-round. To inquire, contact your local Soil & Water Conservation District.	**The deadline to apply for the next CSP signup is expected to be announced in late January 2010.** **CSP payments related to Cover Crops:** CSP payments in general (for all practices) are based on the environmental benefits of existing and proposed new conservation practices/activities across the entire farm—including many related to Cover Crops such as Continuous Seasonal Cover Crops, Cover Crop Mixes, Nitrogen-Scavenging Cover Crops, Legume Cover Crops as a Nitrogen Source, Non-Chemical Methods to Kill Cover Crops, cover crops used in Transitioning to Organic Farming or Beneficial Insect Habitat, On-Farm Pilot Projects and On-Farm Research & Demonstrations. Most of these activities have additional Minnesota-specific requirements. As of the date below, USDA estimates that CSP payments for enrolled cropland will average $12 to $22 per acre, plus supplemental	The next EQIP application scoring period is expected to begin in February 2010. Payment rate information may change for 2010; the information below is for 2009. See contact information below to check for updates **EQIP Payment for Cover Crop:** Annual payment of $23 to $40 per acre (or $33 to $58 per acre for farmers applying through the EQIP Organic Initiative) on up to 320 acres of cropland, for up to 3 years. The payment rate depends on the type of cover crop and when & how planted, with legumes at the high end and spring-seeded small grains at the low end of the range. Higher payment rates apply to Historically Underserved Participants. See EQIP Cover Crops payment details for more information. EQIP applications are accepted anytime but there are deadlines for	Special financial incentives are sometimes offered to landowners in a particular county or watershed for selected conservation practices for a limited time – usually as part of a special initiative funded by a federal or state grant. To find out if any special conservation incentives are offered in your area at this time, contact your local Soil & Water Conservation District, watershed organization, county Resource Conservation & Development office or other local contacts. For examples of special local & regional offers or information about the enabling grant programs, click on **Local & Regional Programs** at the top of this column.	To browse for other potential sources of financial or free technical assistance for **Cover Crops** on farmland, click on **Other Programs** at the top of this column, with special attention to *Sustainable Ag & Working Lands* programs, esp. MDA Sustainable Agriculture Loans and SARE Farmer Rancher Grants.

Minnesota Board of Water and Soil Resources (BWSR)

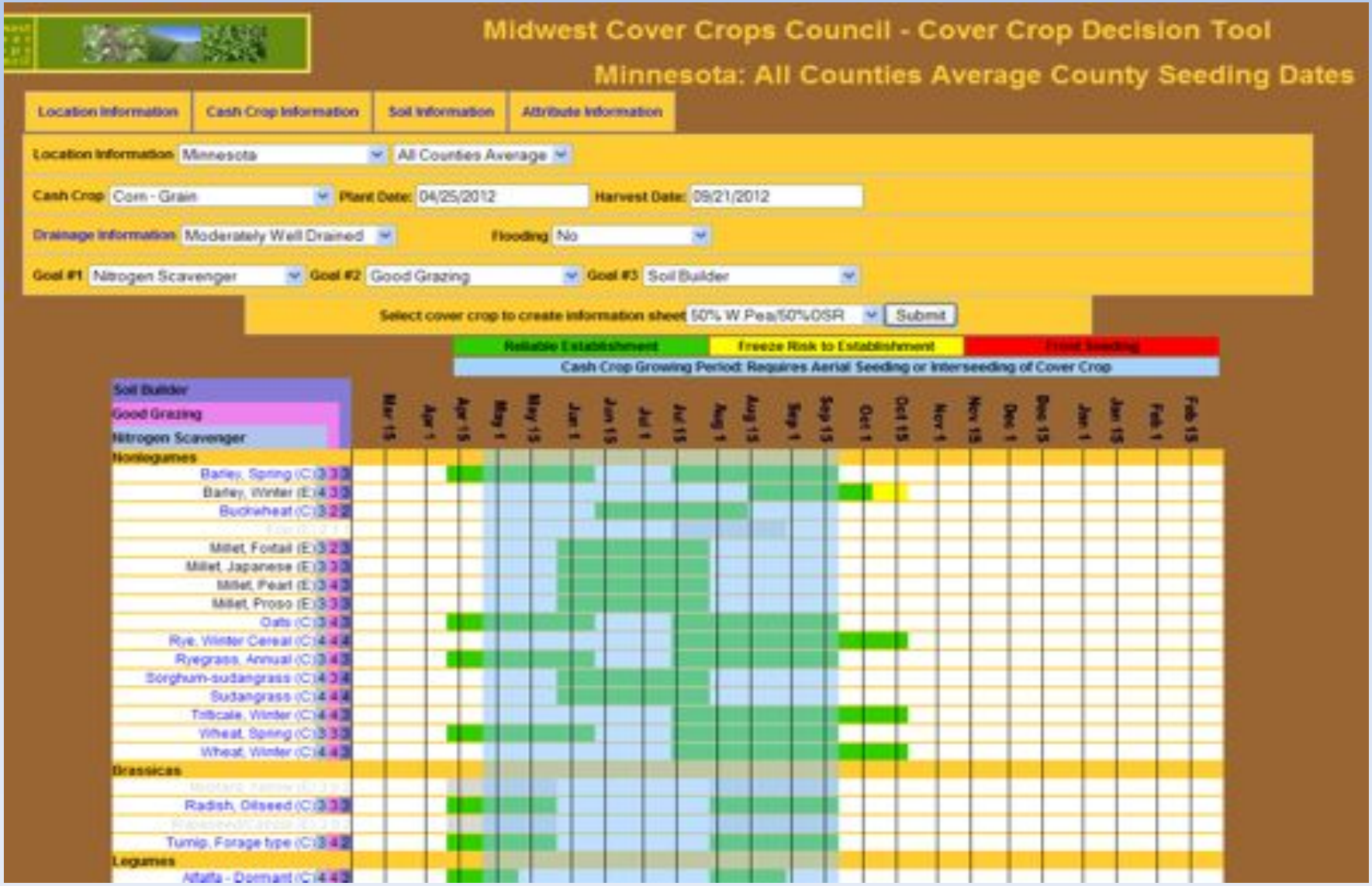
- Conservation Implementation
- Resource Management and Planning
- State Soils Information
- Grants

Soil and Water Conservation Districts (SWCD)

- Individual Conservation Districts
- Ag BMP Loan Program
- Local and Regional Programs
- Grants

Midwest Cover Crops Council

Cover Crop Decision Tool



Challenges

- Prices
- Rent
- Climate –more extreme events
- Growing crops on vulnerable landscapes
- Winter Cover Crops adapted for Minnesota
- No-till/Strip Tillage adoption

Questions?

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