



Agricultural Chemical Reduction Effort (ACRE) 2023-2024 Implementation Report

April 2024

Introduction

The Agricultural Chemical Reduction Effort (ACRE) Plan is an outcome of the 2020-2030 [Dakota County Groundwater Plan](#), which identified farm chemicals -- nitrate, crop herbicides, and chloride – as risks to drinking water in rural parts of the county. ACRE was developed in collaboration with the agricultural community and with local, regional, and state stakeholder feedback. The ACRE Plan was adopted by the Dakota County Board of Commissioners in October 2022.

The ACRE program focuses primarily on reduction of agricultural related nitrate contamination in groundwater, and addressing other agricultural contaminants where practical, through voluntary adoption of best management practices (BMPs) and alternate management tools (AMTs).

The implementation framework identifies prioritized, targeted, and measurable activities necessary to achieve the Plan goals through four main strategies (1) Collect information for decision making; (2) Increase communication and education; (3) Provide technical assistance; and (4) Provide financial incentives. ACRE Plan implementation is being conducted in partnership with the Dakota Soil and Water Conservation District (SWCD).

2023-2024 Project Highlights

Dakota County was successful in implementing strategies identified within the ACRE Plan in close collaboration with the SWCD, as well as other local, regional, and state community partners. Dakota County was awarded a **\$50,000 Minnesota Department of Health (MDH), Groundwater Protection - Accelerated Implementation Grant** provided through the Clean Water Land and Legacy Amendment to support 2023-2024 Dakota County and SWCD staff time for ACRE implementation activities. Below is a summary of progress toward ACRE objectives.

Collect information for Decision Making (Strategy 1)

Dakota County collaborated with several organizations to monitor, model, and collection information to better understand agricultural practices and groundwater conditions in Dakota County. The following is a summary of activities conducted:

Conservation Practice Implementation Tracking (ACRE 1A). Dakota County conducted a conservation practice analysis to estimate acreage of cover crops implemented in Dakota County. Several methods were utilized to determine practice adoption, to include (1) Minnesota Office of Soil Health (MOSH) remote sensing data summarizing percent of fields

planted with cover crops at the minor HUC-12 watershed; (2) Transect survey data from over 200 field observations collected throughout the county to document whether fields were planted as cover crops or left fallow; (3) Georeferencing SWCD cover crop contracts to verify various fields that were planted as cover crops; and (4) Natural Resources Conservation Service (NRCS) program enrollment for cover crops and other water conservation practices such as irrigation water management, perennial crops, and nutrient management planning.

These results provide Dakota County, SWCD, the Minnesota Department of Agriculture (MDA) and other partners valuable information about the distribution of cover crops planted in the county. The ACRE Plan estimated a cover crop adoption rate of roughly four to five percent, based on annual SWCD contract data. However, there are many landowners who adopt cover crops and other water conservation projects through other agencies or on their own. Results indicate that some areas of the county have upwards of 10-20 percent of fields in cover crops (Figure 1). This analysis provides an improved baseline of how many fields are planted with cover crops, regardless of funding sources or program enrollment, and will facilitate where targeted outreach is needed to achieve adoption rate goals. The full 2023 Baseline Conservation Practice Assessment can be viewed [here](#). It will be important to continue annual conservation practice analysis over the next several years to evaluate progress towards cover crop adoption rate goals.

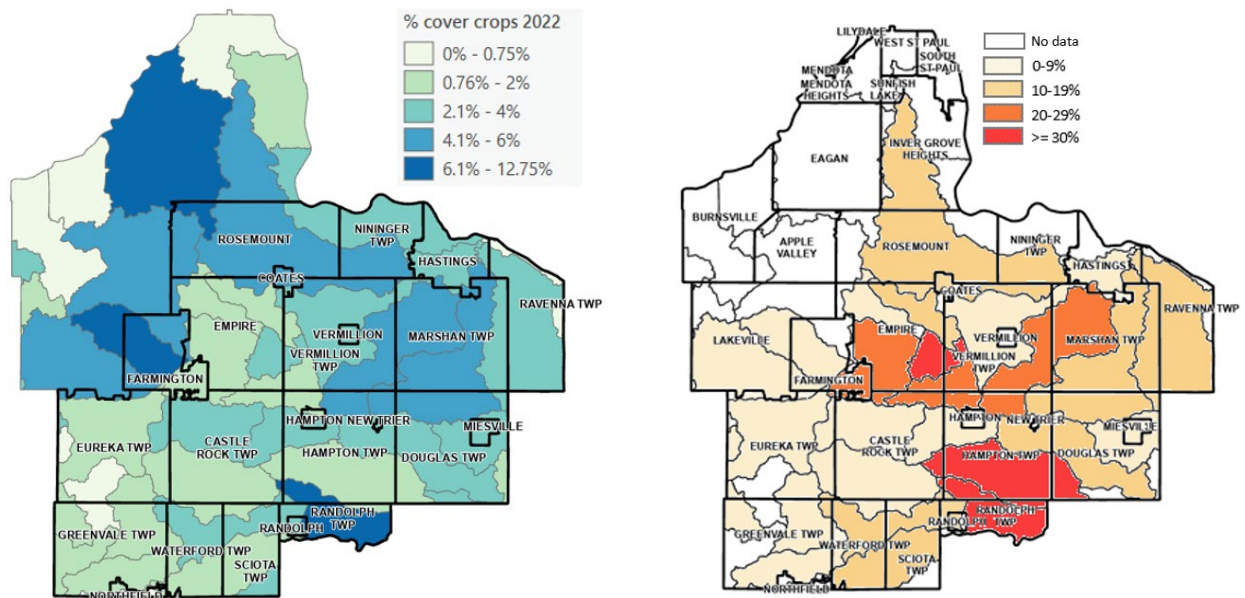


Figure 1. Percent Cover Crops by minor watershed as estimated by (1) 2022 MOSH remote sensing data(left); and (2) 2023 transect survey analysis (right)

Long-Term Monitoring Network Sampling (ACRE 1B). Dakota County installed 15 shallow groundwater monitoring wells in 2021-2022. The county monitoring well network is meant to complement the MDA monitoring network established within the Hastings’ drinking water supply management area (DWSMA). All 15 wells were sampled three times in 2023 (spring, summer, and fall) for water levels, nitrate, chloride, and other general chemistry parameters. There is not sufficient data at this time to conduct statistical analysis to determine trends; however, the annual [ACRE Monitoring Well Network Factsheet](#) and the [ACRE Well Results Dashboard](#) are updated on the website. Average nitrate concentrations ranged from 0.05 mg/L (milligrams per liter) to upwards of 27.21 mg/L in the shallow groundwater.

Community Focused Sampling (ACRE 1C & 1F). Dakota County continued to provide no-cost water testing to private well owners for nitrate, manganese, arsenic, chloride, and lead through the Community Focused Sampling Program. In 2023, water sample kits were offered to over 2,000 private well owners in Inver Grove Heights and Eureka Township, of

which 556 households participated. A full summary of results by community is available on the [Community Sampling Results Website](#). Water quality data by population demographics is still being analyzed for statistical trends.

Collect and Evaluate Information on Ongoing Basis (ACRE 1H). Dakota County collaborated with the St. Croix Research Station to identify potential corn and soybean crop lands that may have lower profit margins based on soil types, irrigation, and other factors. This data was provided to the SWCD to assist them in identifying fields for targeted outreach for possible conversion to perennial crops, or other water conservation practices.

Staff also worked with the Metropolitan Council and the Minnesota Pollution Control Agency (MPCA) to obtain biosolid application data in order to better understand how prevalent biosolid land application is being utilized as a nutrient source in Dakota County. At least 360 fields have biosolids applied since 1991; however, data is still being analyzed. Mapping biosolid applications in conjunction with groundwater monitoring will provide information of potential nutrient impacts to groundwater over time.

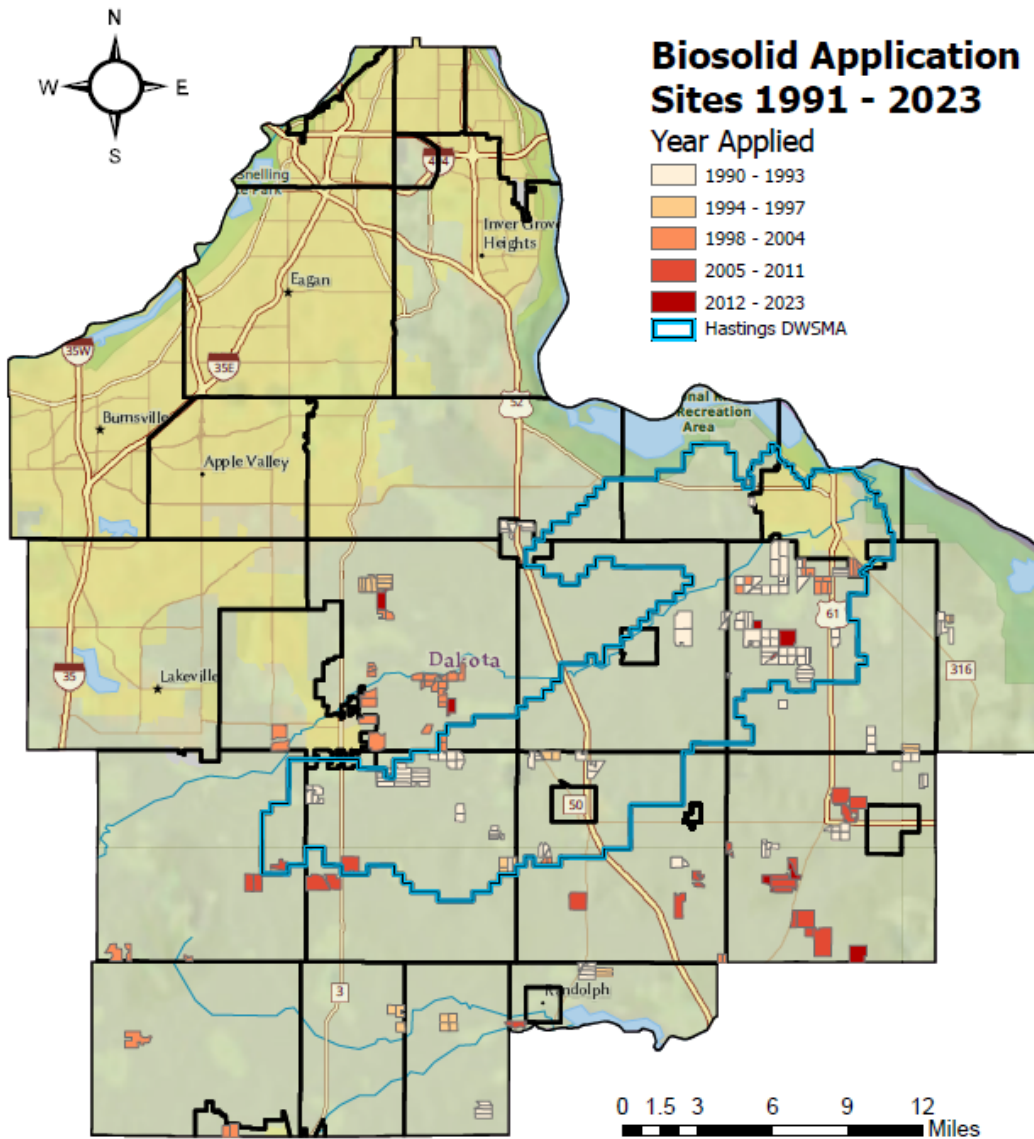


Figure 2. Biosolid application sites

Communicate and Educate (Strategy 2)

Environmental Resources staff continued to collaborate with the SWCD, Vermillion River Watershed Joint Powers Organization (VRWJPO), MDA, and the Dakota County Communications Department to promote practices to improve water quality and raise awareness of educational and cost-share opportunities. Activities included:

Annual ACRE Update (ACRE 2A): In collaboration with the SWCD, VRWJPO, and other Environmental Resources Department units, staff developed an Annual Healthy Living Rural Newsletter. The Newsletter provided information and tips on recycling, waste reduction and conservation practices to help build a healthier rural environment. ACRE related articles focused on promotion of agricultural conservation practices, native prairie restoration, nitrogen fertilizer best management practices, and information for private well and septic system owners. The Newsletter was mailed to over 6,300 rural residents in mid-November 2023. The Newsletter is available [Dakota County Rural Newsletter Website](#).

Test your well water

Protect your health. Test your well water for:

<input checked="" type="checkbox"/> Coliform Bacteria <i>Every year</i>	<input checked="" type="checkbox"/> Lead <i>At least once</i>
<input checked="" type="checkbox"/> Nitrate <i>Every other year</i>	<input checked="" type="checkbox"/> Manganese <i>At least once</i>
<input checked="" type="checkbox"/> Arsenic <i>At least once</i>	

Call 952-891-7000 or visit www.dakotacounty.us, search *water test kit*.



**TEST
THE WATERS**



Take care of your septic system

A properly maintained septic system safeguards your family's health, protects the environment and can save money on repairs. Follow these tips:

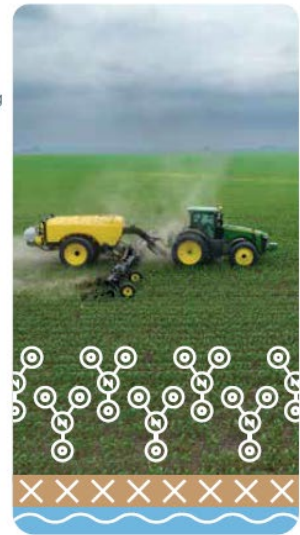
- **Don't overload the commode.** Toss wipes labeled flushable as they don't belong in your septic system. Flush toilet paper only.
- **Think at the sink.** Limit garbage disposal use. Avoid pouring fats, grease, solids and harsh chemicals down the drain.
- **Don't strain the drain.** Stagger the use of water-based appliances like dishwashers and washing machines. Make sure they're energy efficient.
- **Protect the drain field.** Divert rain and surface water away, never park or plant trees on your drain field.
- **Pump the tank.** Hire a professional to pump and check the septic system tank every three years.
- **Test private wells.** Test drinking water from your private well to ensure it remains free of contamination. To learn how a septic system works, visit www.epa.gov, search *how septic systems work*.

Be Nitrogen Smart

Nitrogen Smart training is coming to Dakota County spring of 2024. Offered by the University of Minnesota Extension, the training will provide farmers the fundamentals of nitrogen management for row crop agriculture and to help maximize economic return on nitrogen investments while minimizing losses. The course will be offered online or in person.

In-person training: Contact Matthew Belanger at 952-891-7132 or visit www.dakotaswcd.org, search *land and water*.

Online course: Visit www.extension.umn.edu, search *nitrogen smart online*.



Nitrogen fertilizer best practices

The Minnesota Department of Agriculture, along with the input from area farmers and agronomists, published a list of nitrogen fertilizer Best Management Practices for the Hastings Drinking Water Supply Management Area (DWSMA). These practices will help reduce nitrate loss to the local water supply and are expected to be adopted on at least 80 percent of the area cropland. Compliance will be monitored by the 2026 growing season.

To view a map of the DWSMA, visit www.mda.state.mn.us, search *Hastings DWSMA*.



Figure 3. Healthy Rural Living Newsletter Clip

Promote participation in conservation programs and distribute information through a variety of platforms (ACRE 2B & 2C): Dakota County worked with partners to promote programs through multiple different platforms. Staff developed a [Land Management Practices for Improving Groundwater Quality Story Map](#) highlighting six water conservation practices and several Dakota County farmers successfully implementing these projects. The Story Map was highlighted in the December 14th [Clean Water Council Update](#). The goal is to continue to build upon the Story Map, where applicable, and share through numerous avenues to increase interest in these land management practices.

Additional outreach efforts also included: messaging highlighting ACRE information at the Dakota County Fair, development of ACRE factsheets and flyers summarizing water conservation projects by practice for tabling events. Staff also worked with Dakota County Communications to develop an ACRE messaging campaign. The goal of the ACRE media campaign is to bring awareness to financial and technical assistance opportunities available for landowners to adopt water conservation BMPs on their land. Development of campaign materials was based on stakeholder input from the Agricultural Advisory Group consisting of local farmers and ag service providers. The campaign will share information through a variety of channels such as informative videos, [news releases](#), social media posts, interviews, and mailings.



Figure 4. ACRE Campaign news release in local paper

The campaign’s tagline is “Leave a Legacy” to highlight the importance of doing your part to protect land for future residents. The colors in the graphic below are meant to represent blue for water, gold for cropland, green for trees, and the rising sun represents future generations.



Figure 5. ACRE Messaging Campaign Design

Create Agricultural Advisory Group (ACRE 2E): The annual Agricultural Advisory Group (AAG) meeting was held on December 7, 2023. Dakota County, SWCD, and VRWJPO staff; representatives from the MN Agricultural Water Resources Center; Bailey’s Nursery; and three local farmers attended the meeting. The meeting included updating the AAG on 2023 ACRE activities and soliciting feedback on 2024 planned activities to include the ACRE messaging campaigns, irrigation water testing events, training, and other demonstration, education, and outreach ideas. Feedback and recommendations provided by the AAG will be incorporated into 2024 ACRE Programs.

Provide in-person updates to townships and cities (ACRE 2F): In 2023, staff conducted in-person presentations to all 12 Dakota County Township Boards and the Empire City Council. Presentations consisted of specific groundwater and private well water quality for each township/city, and updates on ACRE implementation to encourage collaboration between rural communities and participation in conservation practices.

Advocate for agricultural water quality practices with service providers (ACRE 2G). Discussions with agricultural service providers such as co-ops, retailers, and agronomists were led by the SWCD. Staff identified key individuals at area co-ops and met with them to discuss programs and goals. Co-op staff intend to share SWCD cost-share program information with their peers and growers.

Technical Assistance (Strategy 3)

Implementation of Technical Assistance was led by the SWCD, SWCD provides hands-on assistance to farmers with implementing water quality practices. In addition, Dakota County and SWCD collaborated with the University of Minnesota (UMN) – Forever Green Initiative, UMN – Extension, UMN – Water Resources Center, Metropolitan Council, and other local organizations to increase participation in conservation programs. Below is a summary of activities:

Partner to provide education, technical assistance, and awareness of programs and practices (ACRE 3A- 3C): Dakota County and the SWCD were successful in collaborating with multiple organizations to start the discussion and bring more awareness to programs and practices to Dakota County farmers. Collaboration between UMN-Forever Green, SWCD, MDA, and the City of Hastings resulted in a perennial plot that can be used as a demonstration project in Dakota County for educational field days starting in 2024 (Figure 6). This was a great success for the area, the Hastings City Council voted unanimously to support the perennial crop bid, which will likely include a combination of alfalfa and kernza planted on the 82 acres within the DWSMA. The group has started meeting to discuss goals and potential education and outreach opportunities in the coming year(s). In addition to the Hastings’ location, Dakota County, SWCD and the Met Council have started discussions regarding potential partnership and ideas on implementing water quality best


management practices on approximately 100 acres of farmland adjacent to the Empire Wastewater Treatment Plant owned by the Met Council.

BENEFITS OF PERENNIAL CROPS


PARTNERING ON CITY OF HASTINGS CROPLAND

- 01 Goals Align**


City of Hastings Wellhead Protection Plan goals include “Encourage agriculture land use practices that minimize nitrate loading to groundwater” and “Support the distribution of educational materials aimed at reducing nitrate loading to groundwater from agricultural lands.” These align with partner goals in the State Groundwater Protection Rule and County Agricultural Chemical Reduction Effort (ACRE) Plan.


- 02 Real Results**


Perennial crops have deep roots in the soil year-round that are proven to reduce nitrate leaching to groundwater. Groundwater modeling results show a potential reduction of nitrate leaching by 90% if this field is converted from annual row crops to perennial crops.


- 03 Story Worth Sharing**

Perennial crops, such as Kernza® come with a great story about water quality and partnerships. Highlighting these benefits could bring new businesses to the Hastings community and shows leadership from the City of Hastings for addressing the nitrate issue.


- 04 One Field to Many**

While the City of Hastings cropland is just one field, educational field days hosted at this field can help expand knowledge about perennial crops, helping others feel confident about planting perennial crops throughout the Hastings Drinking Water Supply Management Area (DWSMA).


- 05 Establish Connections**

Current partners include Forever Green Initiative (FGI), Minnesota Department of Agriculture (MDA), Dakota County, Dakota Soil and Water Conservation District (SWCD) and Perennial Pantry. Each partner brings unique resources to the table and all have connections with farmers.




Figure 6. Flyer provided to Hastings City Council to promote partnership

In addition, Dakota County developed and coordinated an [Irrigation Water Testing](#) pilot event in collaboration with SWCD. Local farmers with water irrigation systems could test their water for nitrates at no-cost. The purpose was for farmers to learn how they can properly credit nitrogen in their irrigation water in their nutrient management plan. Although this event was promoted through social media, newsletters, Farm Service Agencies, and Irrigator Associations, there were no participants. However, as a pilot program, this did provide opportunities for lessons learned. Based on Agriculture Advisory Group feedback, suggestions for improvement included offering the program on a larger timescale throughout the summer rather than one month, providing more convenient drop-off locations for irrigation water, offering testing as a service where SWCD or Environmental Resources staff will sample water for participants, and offering testing at a scheduled training or educational event. Further partnerships are also being explored with the MN Agricultural Water Resources Center for a possible irrigation water testing event in 2024.

Host Nitrogen Smart and other training (ACRE 3E): Dakota County collaborated with UMN – Extension to bring Nitrogen Smart training to Dakota County in order to reduce travel time for local farmers; training was provided in Farmington in March 2024. To increase participation, the advanced N Smart Training – A Deep Dive into the 4Rs – was selected for the offering, since many farmers have already participated in the basic N Smart Training curriculum. UMN – Extension agreed to teach the curriculum to attendees so long as Dakota County partners agreed to lead outreach efforts. A total of nine (9) Dakota County landowners attended the N Smart training.

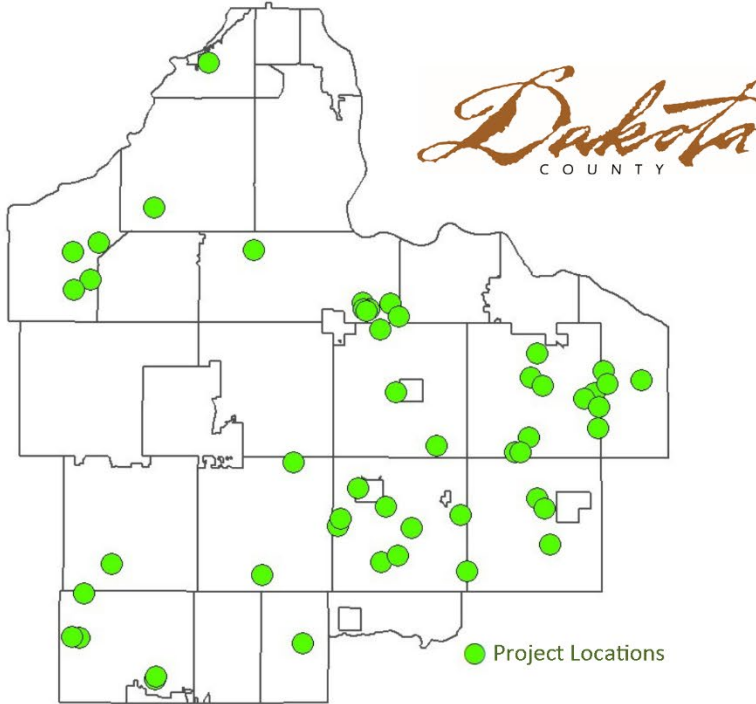
Partner with UMN Extension to conduct large-scale plant tissue nitrogen testing (ACRE 3F): After several conversations with UMN-Extension staff, it was determined that the research indicates that plant tissue testing for nitrogen is not a reliable indicator for fertilizer application rates the following years due to crop-to-crop nitrogen uptake variability. Researchers and UMN – Extension recommended we do not move forward with this tactic.

Financial Incentives (Strategy 4)

Dakota County partnered with SWCD to promote and fund voluntary BMP and AMT adoption. Implementation of Financial Incentives is led by the SWCD based upon annual Board of Supervisor approved policy programs, with funding assistance from Dakota County and state grants. SWCD secured funding for practices through a variety of grants, including Watershed Based Implementation Funding, Drinking Water Protection, and Competitive Clean Water Fund grants. SWCD also continues to pursue ways to increase staff capacity, such as the Board of Water and Soil Resources (BWSR) Soil Health Staffing grant.

Provide cost-share through SWCD for adoption of water quality practices (ACRE 4B): In 2023, Dakota County provided \$250,000 in cost-share funding to the SWCD to support technical assistance and installation of water quality best management practices. Cost-share grants supported 2,500 acres of cover crops on 28 fields, and 8.1 acres of native prairie restoration, resulting in 11,403 pounds of nitrate reduction per year.

DAKOTA COUNTY 2023 CIP PROJECT FUNDING



PROJECT: In 2023 the SWCD was provided \$250,000 of CIP funds through the Environmental Resources Department budget and Environmental Legacy Funds (ELF). These funds have been used to provide technical assistance and project funding throughout Dakota County. The funds were used to establish projects such as cover crops on annually cultivated fields, erosion and sediment control practices, and native prairie plantings with pollinator habitat.



Construction of a grassed and rock-lined waterway to reduce erosion in areas of concentrated surface water runoff



Harvestable cover that provides over-winter protection of soils, erosion control, reduced nutrient leaching.

PRACTICES:

- 2,500 acres of cover crops on 38 fields
- 8.1 acres of native prairie restoration with pollinator habitat
- 4 bioretention basins
- 2 water and sediment control basins
- 2,265 linear feet of grassed waterway
- 1 Grade Stabilization

2023 BENEFITS:

- 938 tons of soil per year prevented from traveling downstream
- 1,192 lbs. of phosphorous per year prevented from traveling downstream
- 11,403 lbs. of nitrogen prevented from leaching into groundwater

PARTNER:

- Dakota County

INSTALLATION:

- 2023

Figure 7. 2023 SWCD Water Quality Practice Implementation

2024-2025 Projected Projects

ACRE Plan implementation will focus on the following components in 2024-2025:

- 1) Continue to collect information for decision making purposes, especially in the early years of ACRE implementation to verify baseline conditions.
 - Continue to verify farming practices being implemented and maintained on existing acreage throughout the County (ACRE tactic 1A).
 - Conduct annual sampling of the long-term monitoring network (ACRE tactic 1B).
- 2) Increase communication and outreach efforts to the farming and rural communities.
 - Create and distribute an annual ACRE update through Health Rural Living Newsletter (ACRE tactic 2A).
 - Coordinate with SWCD to distribute information, training, and program incentive opportunities utilizing a variety of platforms (ACRE tactic 2C).
 - Host annual Agricultural Advisory Group meeting to provide guidance to Dakota County and SWCD staff (ACRE tactic 2E).
 - Provide in-person updates to cities and townships on ACRE progress (ACRE tactic 2F).
 - Work with service providers such as agronomist, co-ops, retailers, etc. to advocate for water quality practices (ACRE tactic 2G).
- 3) Increase Technical Assistance
 - Collaborate with MN Agricultural Water Resources Center and partners to offer irrigation water nitrate testing (ACRE 3A)
 - Collaborate with the SWCD on ways to expand the availability and awareness of one-on-one technical assistance to farmers for water quality improvement practices (ACRE tactic 3B).
 - Explore ways to assist landlords and renters implement water quality practices (ACRE 3D)
- 4) Work with the County Board and/or the SWCD to identify resources and expand incentive programs as necessary to achieve ACRE Plan adoption rate goals (ACRE tactics 4A-J).

For questions on the Groundwater Plan or annual report please contact groundwater@co.dakota.mn.us, or 952-891-7000.

Thank you to the Dakota SWCD and other Dakota County partners for your assistance in implementing the ACRE and Groundwater Plan