

Best Management Practices for the Cold Spring Drinking Water Supply Management Area



DWSMA

August 2026

This document is a list of University of Minnesota nitrogen (N) fertilizer best management practices (BMPs) that apply within the Cold Spring Drinking Water Supply Management Area (DWSMA). The BMPs are from the following University of Minnesota resources:

- Best Management Practices for Nitrogen on Coarse Textured Soils
- Best Management Practices for Nitrogen Use in South-Central Minnesota
- Fertilizing Corn in Minnesota
- University of Minnesota Extension webpage [Crop-Specific Nutrient Needs](https://extension.umn.edu/crop-production/nutrient-management) (extension.umn.edu/crop-production/nutrient-management)

Considerations when reading the BMP tables

- The BMPs listed below are applicable to all soils or specific to coarse-textured soils. All cropland soils within the Cold Spring DWSMA are classified as coarse-textured.
- The [Cold Spring DWSMA Map](https://mda.state.mn.us/coldspring-dwsma-soil) (mda.state.mn.us/coldspring-dwsma-soil) identifies where coarse soils exist.
- Nitrogen management records must be provided to show that a practice was adopted. If a responsible party does not provide or provides insufficient documentation showing a practice has been implemented, it counts as not implemented during the MDA's evaluation/survey of nitrogen fertilizer BMP implementation.
- Some BMPs may not apply to all cropping systems, such as incorporating urea with tillage in no-till systems. If a BMP is agronomically or technically unsuitable for a specific field based on soil type, topography, crop, or management system, a suitable BMP or alternative management tool (AMT) can be selected in its place.
- See the document "Definitions of Terms in the University of Minnesota Nitrogen Fertilizer BMPs" for definitions of terms related to the BMPs. This document is available on the [Cold Spring DWSMA Webpage](https://mda.state.mn.us/coldspring-dwsma) (mda.state.mn.us/coldspring-dwsma) and used as a reference for BMP 4A, 4B and 5.

Considerations regarding nitrogen rate

- Based on survey data the MDA collected within the Cold Spring DWSMA, producers growing dryland corn currently apply nitrogen rates that are below the University of Minnesota 0.15 maximum return to nitrogen (MRTN) for corn following soybeans. For irrigated corn following soybeans, producers apply at rates lower than the 0.10 MRTN. To protect groundwater below cropland in this DWSMA, the MDA expects that growers will continue to apply nitrogen to corn at their current rates. The nitrogen rates listed below provide a reference for future BMP evaluations and the MDA-approved AMTs.
- The MDA's computer modeling of nitrogen loss below the crop root zone is based on nitrogen rates being applied.
- The strategy for protecting groundwater in this DWSMA, including the nitrogen BMPs listed below, is predicated on producers continuing to apply nitrogen at their current corn nitrogen rates.

Questions or Comments?

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Best Management Practices (BMPs)

The BMPs numbered 1–3 apply to all soil types and are the most important BMPs to reduce nitrate losses.

BMP	Nitrogen Rate BMPs for All Soil Types
1	Dryland corn: at or below the 0.15 Maximum Return to Nitrogen (MRTN) Currently up to 165 lb N/ac for corn following corn Currently up to 135 lb N/ac for corn following soybeans Irrigated corn: at or below the 0.10 MRTN Currently up to 210 lb N/ac for corn following corn Currently up to 180 lb N/ac for corn following soybeans References: • Corn nitrogen rates are based on current nitrogen fertilizer application guidelines for corn from the University of Minnesota (extension.umn.edu/crop-specific-needs/fertilizing-corn-minnesota) or its successor. • For other crops grown in the area, follow the current University of Minnesota nitrogen rate guidance applicable to that crop (extension.umn.edu/nutrient-management/crop-specific-needs). Note: The implementation of approved AMTs may allow a higher nitrogen rate, provided that field-specific data indicates this is appropriate.
2	Include N supplied in a starter, weed-and-feed program, and contributions from phosphorus fertilizers such as MAP and DAP when calculating total N rate Note: The total N rate also should include any AMS or other inorganic fertilizers containing nitrogen.
3	Take appropriate N credit for previous legume crops and manure used in the crop rotation Note: In addition to legumes and manure, total N rate also should include nitrogen from organic sources with a known nitrogen availability factor (i.e. research-based nitrogen availability tables, laboratory analysis, including first- and second-year credits) such as biosolids and industrial by-products.

BMP	Nitrogen Placement, Timing and Source BMPs for Coarse Textured Soils
4A	Use split applications of N fertilizer Notes: Nitrogen loss modeling indicates that the application timing practices listed in BMP 4A and 4B for coarse-textured soils provide a similar groundwater-protection benefit. The adoption of at least one of the practices listed in 4A or 4B is needed to count as having adopted BMP 4. This split-application BMP applies only to corn and edible bean acres that receive commercial nitrogen fertilizer. If manure is the only source of nitrogen, this BMP does not apply. Refer to the definition of split application in the “Definition of Terms in the University of Minnesota Nitrogen Fertilizer BMPs.” Practices that meet this definition will be considered meeting this BMP.
4B	Spring preplant application of ESN (polymer-coated urea) Notes: Nitrogen-loss modeling indicates that the application timing practices listed in BMP 4A and 4B for coarse-textured soils provide a similar groundwater-protection benefit. The adoption of at least one of the practices listed in 4A or 4B is needed to count as having adopted BMP 4. Refer to the definition of ESN in the “Definition of Terms in the University of Minnesota Nitrogen Fertilizer BMPs.” This definition includes the allowable urea/ESN ratio.
5	Use N stabilizer (N-Serve) on labeled crops when early sidedress is used Notes: For corn, this BMP applies to situations when a portion of the total nitrogen fertilizer is applied preplant and the remainder is applied as a single sidedress application early in the growing season. Early in the growing season is defined as the period from crop emergence through V4 growth state. This BMP does not apply to situations when there is more than one sidedress application within the growing season. For edible beans, early sidedress is defined as within 17 days after planting. Refer to the definition of a nitrogen stabilizer in the “Definition of Terms in the University of Minnesota Nitrogen Fertilizer BMPs.” Products that meet this definition will be considered to meet this BMP.

Record Keeping

Keep records of nitrogen use, including rates, crediting of nitrogen sources, timing, placement, and source. The MDA will provide guidance on recordkeeping requirements.

Note: An example recordkeeping form is available on the [Cold Spring DWSMA webpage](https://mda.state.mn.us/coldspring-dwsma) (mda.state.mn.us/coldspring-dwsma).

Additional Practices and AMTs

The tables below are additional practices and AMTs. Adoption of these practices is not required in a Mitigation Level 2 DWSMA. However, each of the listed practices could protect groundwater or guide the use of nitrogen fertilizer. Farmers are encouraged to consider these practices, although some may not be appropriate or applicable to every farm.

Additional Practices	Applies to
Convert corn-corn rotation to corn-soybean 110 acres of corn-corn were recently converted to corn-soybean rotation. Modeling indicates this change results in a DWSMA-wide nitrogen loss reduction of 6.6%.	All acres under corn-corn rotations
Test manure using a lab certified or approved by MDA	All agronomic crops on all soils
Field testing to determine nitrogen requirements for specific crops	All agronomic crops on all soils
Collect irrigation well water samples to augment the long-term private well monitoring network data	All agronomic crops on all soils

AMTs provide additional protection from the loss of nitrogen below cropland. The following is a list of AMTs discussed with the local advisory team (LAT), which acknowledges the protective potential of these practices. The MDA will work with the LAT, City of Cold Spring, local conservation district staff, and other state agencies to seek out funding to support adoption of these AMTs within the Cold Spring DWSMA.

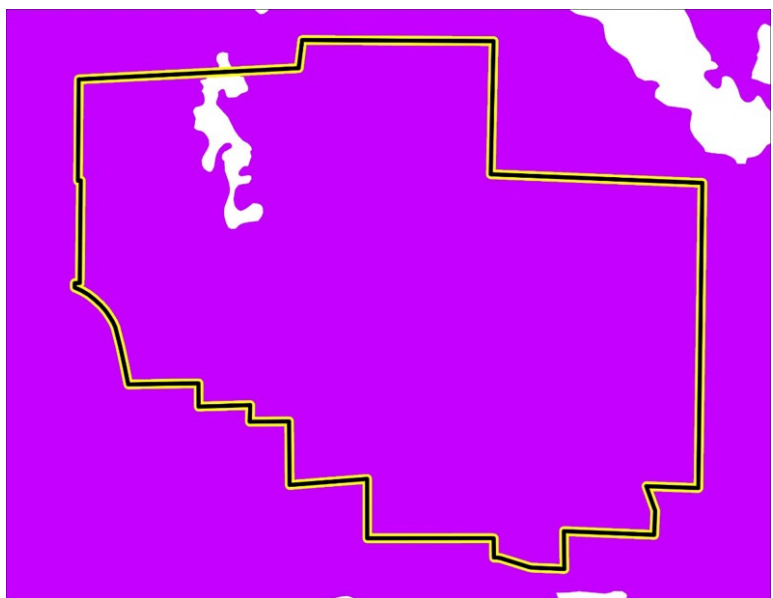
Producers can voluntarily adopt these AMTs. During the MDA's evaluation of nitrogen fertilizer BMPs in a Mitigation Level 2 DWSMA, some AMTs can substitute for a BMP. However, AMT adoption is not required to pass the BMP evaluation in a Mitigation Level 2 DWSMA.

Alternative Management Tools (AMTs)	Applies to
Perennial vegetation Modeling indicates a 22% DWSMA-wide nitrogen loss reduction if 234 acres of dryland corn-soybeans convert to corn-corn-alfalfa-alfalfa-alfalfa rotation.	All acres that currently do not include alfalfa

Alternative Management Tools (AMTs)	Applies to
Land conservation programs	All acres
Cover crops	All acres
Minnesota Ag Water Quality Certification Program	All acres
On-farm nitrogen rate trials	All acres
Precision nitrogen management	All acres

On irrigated acres within the Cold Spring DWSMA, irrigation water application timing decisions and system upgrades to improve irrigation water-use efficiency could further reduce the risk of saturated soil conditions that are conducive to leaching. The irrigation technology Regional Conservation Partnership Program (RCPP) grant sponsored by the MDA is an example of the type of promotion and support to expand adoption of these tools. More information is available at the [precision irrigation cost-share website](https://mda.state.mn.us/precision-irrigation-cost-share) (mda.state.mn.us/precision-irrigation-cost-share).

Map of the Cold Spring Drinking Water Supply Management Area (DWSMA)



The Cold Spring DWSMA is outlined in yellow and black. Coarse-textured soils are shaded in purple. Within this area, adoption of the BMPs listed on Pages 2 and 3 is needed.

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.