Best Management Practices for the Verndale Drinking Water Supply Management Area (DWSMA)

Updated: 5-24-2023

This document is a list of the University of Minnesota nitrogen (N) fertilizer best management practices (BMPs) that apply within the Verndale 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,
- Fertilizing Corn in Minnesota, and
- University of Minnesota Extension webpage Crop-Specific Nutrient Needs at https://extension.umn.edu/nutrient-management/crop-specific-needs

Considerations when reading the BMP tables

- The BMPs listed are either for coarse-textured (sandy) soils or applicable to all soils. All cropland soils within the Verndale DWSMA are classified as coarse.
- The BMPs on the final list must be implemented on 80% of the cropland (excluding soybean acres) in the DWSMA.
- Nitrogen management records need to 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 non-implemented during the MDA's evaluation/survey of nitrogen fertilizer BMP implementation.
- Some BMPs may not apply to all cropping systems, such as, incorporation of 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 companion document "Definitions of Terms in the University of Minnesota Nitrogen Fertilizer BMPs" for definitions of terms related to the BMPs.

Considerations regarding nitrogen rate

- In the Verndale DWSMA producers growing corn currently apply nitrogen rates that are below the University of Minnesota 0.15 maximum return to nitrogen (MRTN) for both corn following corn and corn following soybeans.
- The MDA's computer modeling of nitrogen loss below the crop root zone in this DWSMA is based on the actual nitrogen rates being applied, however due to the limited number of producers growing corn within this DWSMA the nitrogen rates being applied cannot be listed to protect this private information (Statute 13.643, Subp. 7).
- The strategy for protecting groundwater in this DWMSA including the nitrogen BMPs listed below is predicated on producers continuing to apply nitrogen at their current corn nitrogen rates.

Questions or Comments?

Ryan Perish | MDA Local Project Lead | Ryan.Perish@state.mn.us | 218-898-0002.

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 No	Nitrogen Rate BMPs	Applies to
1	In the Verndale DWSMA corn growers currently apply nitrogen at rates below the MRTN listed below. To protect groundwater below the 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 MDA approved alternative management tools (AMT). Corn nitrogen rates are based on the nitrogen fertilizer application guidelines from the University of Minnesota[1]. Rates were last updated July 2022. **Dryland corn following corn**: up to the 0.15 MRTN (currently at 155 lbs. N/ac)[1] **Dryland corn following soybean:** up to the 0.15 MRTN (currently at 130 lbs. N/ac)[1] For other crops grown in the DWSMA, nitrogen rates must follow the current University of Minnesota guidance applicable to that crop[2]	All agronomic crops on all soils
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	All agronomic crops on all soils
3	Take appropriate N credit for previous legume crops and manure used in the crop rotation	All agronomic crops on all soils

[1] Corn nitrogen rate guidelines from the University of Minnesota https://extension.umn.edu/crop-specific-needs/fertilizing-corn-minnesota

[2] All crops listed at the University of Minnesota Extension webpage Crop-Specific Nutrient Needs at https://extension.umn.edu/nutrient-management/crop-specific-needs or its successor

BMP No	Nitrogen Placement, Timing and Source BMPs	Applies to
4	Use split applications of nitrogen fertilizer	Corn and edible beans on coarse textured soils

Additional Practices	Applies to
Keep records of nitrogen use, including rates, crediting of nitrogen sources, timing, placement, and source. The MDA will provide guidance on record keeping requirements.	All agronomic crops on all soils

Alternative Management Tools (AMTs)

AMTs provide additional protection from the loss of nitrogen below cropland. The following is a list of AMTs that have been discussed with the local advisory team (LAT). The LAT acknowledges the protective potential of these practices. The MDA will work together with the LAT, the City of Verndale, local Soil and Water District staff, and other state agencies to seek out funding to support the adoption of these AMTs within the Verndale DWSMA.

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

Alternative Management Tools (AMTs)	**Applies to**
41 additional acres of cover crop following soybeans in the DWSMA over the 2-year corn-soybean rotation. • This would increase the adoption of cover crops in the DWSMA up to 61 acres over the 2-year corn-soybean rotation (30.5 acres each year)	Soybean acres
14 additional acres of grass hay in the DWSMA. • This would increase the grass hay in the DWSMA up to 73 acres	Corn-Corn or Corn-Soybean acres
15 additional acres in an Alfalfa-Alfalfa-Alfalfa-Corn-Corn rotation	Corn-Corn or Corn-Soybean acres
14 additional acres of perennials planted into a land conservation program	Corn-Corn or Corn-Soybean acres

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