

Water Quality Enhancement Activity – WQL06 – Apply controlled release nitrogen fertilizer



Enhancement Description

At least 50% of the pre-emergent and early post emergent nitrogen fertilizer used for crop production must be slow-release or controlled release formulations.

Land Use Applicability

Cropland and pastureland.

Benefits

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrient management effectively utilizes available nutrient resources to supply crops with nutrients required to efficiently produce food, forage, fiber, and cover while minimizing environmental degradation.

The use of slow or controlled release nitrogen fertilizer makes nitrogen available to plants over a longer portion of the growing season to match the plant uptake needs. This limits the loss of nitrogen to leaching and denitrification, and can help control soil emissions of the greenhouse gas nitrous oxide.

Criteria

Implementation of this enhancement requires:

1. The use of one or more nitrogen fertilizer products defined as slow-release or controlled-release that are recommended or concurred with by NRCS and the state Land Grant University (LGU) on all treatment acres to supply at least 50% of the LGU recommended nitrogen requirement for the crop(s) grown.
2. Application of nutrients within the LGU recommendations based on soil testing and established yield goals and considering all nutrient sources.
3. Minimize soil surface disturbance during nitrogen placement.

Documentation Requirements

1. A map showing where the activities are applied.
2. Fertilizer product used
3. Treatment acres
4. Soil test results
5. Crops grown and yields (both yield goals and measured yield)
6. Calibration of fertilizer application equipment
7. Nutrient application rates/amounts and application dates for each treatment area



Water Quality Enhancement Activity – WQL06 – *Apply Controlled Release Nitrogen Fertilizer*

Reference: 590 – Nutrient Management

Controlled- and Slow-Release Nitrogen Fertilizers	
Slow-Release	Controlled-Release
Urea-formaldehyde or methylene urea formulations	Polymer-coated urea (PCU)
Sulfur-coated urea	
IBDU (isobutylidene diurea)	

PLEASE NOTE:

1. The University of Minnesota has evaluated Poly-coated urea (PCU) for use in corn and potato production and is evaluating its use in wheat production.
 - Use of PCU on corn ground for spring pre-plant applications is recognized in Minnesota’s N-BMP documents for South-Eastern Minnesota with the caveat that use may be economically risky in years where environmental factors have already reduced N loss potential. Use of PCU on corn ground for late fall or spring pre-plant applications is also recognized for South-Central, South-Western and West-Central Minnesota with the additional caveat that limited research has been conducted on PCU in these areas. Use of PCU on coarse textured soils is also noted in these publications.
 - May not significantly reduce N loss potential if used pre-plant to replace in-season N applications
 - Fall applied PCU without incorporation can result in the PCU moving off the field in snowmelt runoff events.

2. Most slow-release N fertilizers were developed and are used primarily for horticultural or turf production purposes. Caution is advised when considering slow release products for field crops. The product should be registered for agricultural use in Minnesota; provide a proven crop yield response similar to traditional sources of N; and be somewhat competitively priced.

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3. Efficacy of slow and controlled release products for minimizing N loss and increasing net income varies by product, crop, area of the state, site, climatic conditions and application timing.
4. Application timing of slow release fertilizers.
 - Use of slow release N applies mainly to spring pre-plant N applications. Caution is advised for in-season applications. The in-season application must be early enough so that sufficient N is released during a crop's rapid growth period. An application soon after plant emergence may be o.k. A late sidedress application of slow or controlled release N is not advisable.
 - Use of slow or controlled release N to justify fall N application is questionable. Limited research is available on the topic. Individuals who currently apply N pre-plant or in-season should not replace this system with a fall application of a slow or controlled release product. Individuals who currently fall apply anhydrous at the correct time should also not consider replacing the anhydrous with a slow-release product. Individuals who currently fall apply other N forms (excluding incidental MAP or DAP applications) are better served considering spring pre-plant or side-dress applications instead of a fall application of a slow or controlled release product.
5. Nitrification inhibitors, urease inhibitors, or products containing nitrification or urease inhibitors are not considered slow or controlled release products for purposes of this enhancement. Enhancement AIR02 addresses nitrification and urease inhibitors.
6. Total nutrient application rates shall be consistent with University of Minnesota or contiguous land grant university recommendations.
<http://www.extension.umn.edu/CommodityCrops/>
<http://www.extension.umn.edu/distribution/cropsystems/DC5886.html>

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