



CONSERVATION ENHANCEMENT ACTIVITY
E590130Z

CONSERVATION
STEWARDSHIP
PROGRAM

Improving nutrient uptake efficiency and reducing risks to air quality – emissions of greenhouse gases (GHGs)

Conservation Practice 590: Nutrient Management

APPLICABLE LAND USE: Crop (annual & mixed); Crop (perennial)

RESOURCE CONCERN ADDRESSED: Air Quality Impacts

PRACTICE LIFE SPAN: 1 year

Enhancement Description

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

Criteria

- Documentation of producer’s record of nutrient management meeting all Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- For Nitrogen, Phosphorus, and Potassium (N-P-K), rates of application are to be agronomic application rate (based on soil test and yield goal).
- Minimize soil surface disturbance during fertilizer placement.
- **Utilize two or more nitrogen use efficiency strategies or technologies** to reduce nitrogen loss risk and improve nutrient use efficiency. Select two or more of the strategies and technologies below:



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- Use Enhanced Efficiency Fertilizer (EEF) products with 1 or more nutrient applications.
 - Nitrogen EEF products recommended by state Land Grant University (LGU) and concurred with by NRCS on all treatment acres to supply at least 50% of the pre-emergent and early post emergent LGU recommended nitrogen requirements for the crop(s) grown.
- Use in-season soil nitrate sampling.
 - Use pre-sidedress soil nitrate test (PSNT) to determine the need and/or amount of additional nitrogen to be applied during sidedress/topdress N application. Conduct a PSNT on a selected crop (e.g. corn) to test if additional N fertilizer is needed.
- Use in-season plant tissue sampling and analysis as a complement to soil testing.
 - Follow local LGU and/or laboratory guidelines for interpretations of the results and appropriate adjustments in the application of N and other nutrients.
- Split nitrogen applications.
 - Apply no more than 50% of total crop nitrogen needs within 30 days prior to planting (or in the case of hay or pasture after green up of dormant grasses). Apply the remaining nitrogen after crop emergence (or green up).
 - Post emergent nitrogen may be reduced based on crop scouting, in-season soil sampling/analysis, or plant tissue sampling/analysis.
- Time nitrogen application timing to match nitrogen uptake timing.
 - Apply nitrogen no more than 30 days prior to planting date of annual crops.
- Nutrient application placement below soil surface.

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- Fertilizer is injected or incorporated at time of application.
- Use of nitrification inhibitors to delay the nitrification process, by eliminating the bacteria *Nitrosomonas* in the area where ammonium is to be present.
 - Materials must be defined by the Association of American Plant Food Control Officials (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition) and label claims.
 - Application timing, method, N source, soil texture, and tillage regime are all factors that should be evaluated to determine where nitrification inhibitors should be used. Before buying an inhibitor make sure scientific evidence backs up all claims. Producers and/or consultants should be wary of any product that does not have solid scientific data demonstrating that the inhibitor activity matches the advertised benefit.
- Use of urease inhibitors to temporarily reduce the activity of the urease enzyme and slow the rate at which urea is hydrolyzed.
 - Materials must be defined by the Association of American Plant Food Control Officials (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition) and label claims.
 - Application timing, method, N source, soil texture, and tillage regime are all factors that should be evaluated to determine where urease inhibitors should be used. Before buying an inhibitor make sure scientific evidence backs up all claims. Producers and/or consultants should be wary of any product that does not have solid scientific data demonstrating that the inhibitor activity matches the advertised benefit.



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Documentation Requirements

- Documentation of nutrient management records meeting all Nutrient Management, CPS 590, general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- Planned nutrient budget, yield goal, and applications (pounds/acre active ingredient nutrients, must include at a minimum N-P-K)
- Actual Applications (pounds/acre active ingredient nutrients, must include at a minimum N-P-K)
- Additional Requirements for specific strategy or technology:
 - In-season soil nitrate sampling. Required documentation must include results (including reference strips) and adjustments in nutrient management based on results.
 - In-season plant tissue sampling and analysis. Required documentation must include type of test used (stalk, leaf, chlorophyll, infrared, or other plant tissue), results (including reference strips), and adjustments in nutrient management based on results.
 - Nutrient application placement below soil surface. Required documentation must include method of injection or incorporation and depth.