

## Air Quality Enhancement Activity– AIR02 – Nitrogen Stabilizers for Air Emissions Control



### Enhancement Description

The use of a nitrogen stabilizer with either urea or ammonium fertilizers to control the rate of ammonia and ammonium conversion. For this enhancement “nitrogen stabilizers” includes nitrification inhibitors and urease inhibitors.

### Land Use Applicability

This enhancement is applicable on cropland and pasture land.

### Benefits

Including a nitrification inhibitor with ammonia-based nitrogen applications will help to control conversion of ammonia to nitrate and ultimately to nitrogen gas through nitric oxide (an ozone precursor) and nitrous oxide (a greenhouse gas). These conversion processes can produce nitrous oxide as a byproduct due to inefficiencies in the conversion processes. Nitrous oxide is a potent greenhouse gas which has 310 times the global warming potential of carbon dioxide on a molecular basis. Using a nitrification inhibitor with applied ammonia-N will help to reduce an enterprise’s nitrous oxide emissions, and improve its overall greenhouse gas footprint. Additionally, it can help to keep more nitrogen in a plant-available form in the soil for a longer period of time.

Including a urease inhibitor will help reduce the volatilization and release of ammonia into the atmosphere that occurs as the urea hydrolyzes. Urease, which is the enzyme from yeast and bacteria in the soil, catalyzes the hydrolysis of urea into carbon dioxide and ammonia. Ammonia emissions are particularly important to air quality because ammonia is a pre-cursor for PM2.5.

### Criteria for Including Nitrification Inhibitor with Nitrogen Application

1. Producer must have a current soil test (no more than 5 years old).
2. Nutrient application rates are within the Land Grant University recommendations based on soil tests and established yield goals considering all nutrient sources. The nutrient application rate must take into account the additional nitrogen that will remain available to the plant due to the inhibition of the nitrification processes.
3. The use of the respective nitrification or urease inhibitor must be in accordance with the manufacturer-recommended rates.
4. Use of the nitrification or urease inhibitor must not increase soil surface disturbance.

### Documentation Requirements for applying nitrification inhibitors to cropland

- A map showing where the enhancement was applied.



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- Dates of application of ammonia-N fertilizer.
- Dates of application of nitrification or urease inhibitor.
- Acres of land treated.
- Soil test results.
  - Manure analysis results.
  - Crops grown and yields (both yield goals and measured yield).
  - Calibration of application equipment.



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## IDAHO ADDENDUM 2009

### **Air Quality Enhancement Activity - AIR02 - *Nitrogen Stabilizers for Air Emissions Control***

#### **Additional guidance for nitrogen stabilizers:**

Ammonia/ammonium based nitrogen fertilizers will typically include:

- Anhydrous ammonia (82-0-0)
- Aqua ammonia (20-0-0)
- 28% or 32% N solution (UAN)
- Ammonium sulfate
- Urea
- Liquid manure

Nitrapyrin is the most widely available nitrification inhibitor (e.g., N-Serve). In some cases, Neem-based inhibitors might be used by organic producers, but the effectiveness is not well established.

For urease inhibitors, phosphoryl di- and tri- amides are the most commonly used inhibitors (e.g., NBPT or Agrotain).

Dicyandiamide or DCD is both a urease and nitrification inhibitor. It is used with granular urea.

**For any inhibitors other than nitrapyrin, NBPT, or DCD, the producer must have concurrence from the Idaho NRCS Nutrient Management Specialist. Under no circumstances can potassium chloride be used as an inhibitor.**

Nitrapyrin is highly volatile - follow all label directions. To protect water quality, do not apply directly to water, or to areas where surface water is present. Do not contaminate water when disposing of equipment washwaters or rinsate. Do not apply through any type of irrigation system. Note crop restrictions on the label.