



Nebraska On-Farm Research: Precision Nitrogen Management Project **Nitrogen Fertilizer Inhibitors for Enhanced Nitrogen Use Efficiency in Corn**

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Objective

The objective of this on-farm trial is to evaluate the effect of fertilizer nitrogen stabilizers (nitrification inhibitors, urease inhibitors) on nitrogen use efficiency (kg grain/kg fertilizer N), nitrogen loss, vegetative growth N stress, crop yield, and profits. Nitrogen Inhibitors would be applied in fall, and/or spring and/or compared with split N application without inhibitors.

Why Participate?

Recent wet years in Nebraska has renewed producer's interest in protecting fertilizer nitrogen loss from volatilization, denitrification, and leaching. Participation in this trial will allow you to evaluate the effect of nitrogen inhibitors in enhancing nitrogen efficiency and crop yield on your farm. You will work closely with Nebraska Extension to accomplish the project. In addition, this study provides you the opportunity in improving nitrogen management and protecting groundwater resources in Nebraska.

Eligible cooperating producers will receive \$600 per study in recognition of their time and resource commitments.

Eligible cooperating producers will receive \$700 per study to mitigate risk of potential yield (and therefore potential profit) loss.

Eligible cooperating producers can apply to receive up to \$1200 reimburse for the cost of purchasing fertilizer nitrogen additives for use in the study.

Study Details

Layout: A randomized complete block design with 4 replications are needed for this trial (Figure 1). Rows planted in each treatment need to be equal to or greater than corn head width. The same hybrid and management practices should be used across the entire study area.

Treatment Options:

- A: Fall nitrogen without Inhibitor
- B: Fall nitrogen with Inhibitor
- C: Spring nitrogen without Inhibitor
- D: Spring nitrogen with Inhibitor
- E: Split nitrogen without inhibitor

Depending on farmer's fertilizer type, urease or nitrification inhibitors could be used in any of the following or other possible combinations.

Nitrification inhibitors option: Urea with Instinct/nitrapyrin, UAN with Instinct/nitrapyrin or DCD, Anhydrous ammonia with N-Serve/nitrapyrin, Ammonium nitrate with nitrapyrin/DCD.

Urease inhibitors option: Urea with Agrotain Ultra/NBPT or Agrotain or Agrotain Plus, Urea with Limus/NBPT/NPPT, UAN with Agrotain Ultra/NBPT or Agrotain or Agrotain Plus, UAN with Limus/NBPT/NPPT

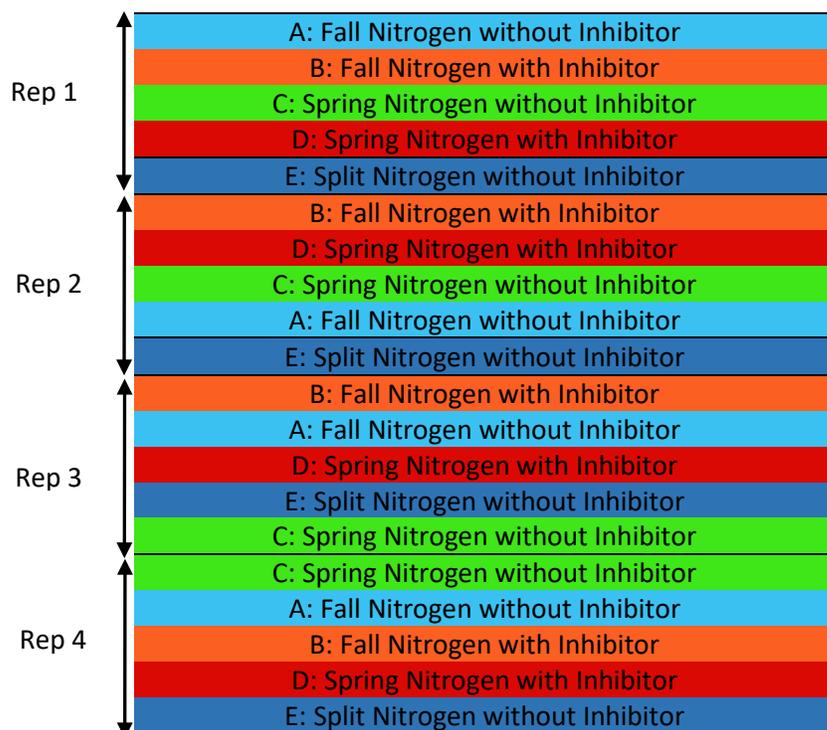


Figure 1. Generic layout of treatments

Data collection:

- Routine soil sampling at 0-8" depth. Soil samples will be collected prior to N application in Fall or spring.
- Early season stand counts.
- Vegetative growth N stress at V10-V12.
- Aerial NDVI imagery during the growing season to observe visual crop canopy differences.
- Soil nitrate and ammonium sampling at 0-12" depth in Nov. March, April, May following fall fertilizer N application, and March, April, May after spring application, and at 0-12", 12-24" soil depth in June for fall, spring and split application.
- Yield monitor data for study year and previous crops.
- Variable rate fertilizer N map for previous year, if any.
- Site rainfall and soil moisture data.

Grower Requirements

Site Selection:

- Poorly drained or well aerated soil
- No manure applications in last 5 years
- Will plant 1 hybrid in field
- Follow same management practices for all treatments

Are you willing to:

- Flag or mark GPS location of each treatment.
- Provide all necessary inputs for crop production
- Complete background agronomic form about site and practices e.g. soil type as defined by USDA, previous tillage conditions, hybrid planted, tillage system, residue type, and planting depth etc.
- Collect yield data with a **well calibrated** yield monitor. (Contact UNL Extension if assistance with this process is needed.)
- Submit harvest data to UNL Extension within 30 days of harvest or by Dec. 15.
- Allow UNL Extension to use submitted and collected data for research, educational, and informational purposes.
- Willing to work closely with the UNL researchers to set up treatments in field length strips.

Study Questionnaire (to help us plan the best study scenario):

- What nitrogen fertilizer application method do you use at your farm? _____
- Which nitrogen fertilizer and inhibitor are you interested in using (see above or provide other options)? _____
- Do you have capability of applying inhibitors with nitrogen fertilizer? _____
- Do you have in-season N capabilities or willing to hire in-season N application _____
- Irrigated or non-irrigated? _____
- Farm/field location? _____
- Describe you current N management plan _____

- Field history (was there a study conducted on this field in the past 5 years? Manure use? Variable management? Broadcast, incorporated, or banded fertilizer?) please describe.

Because this study is sponsored by USDA-NRCS, all participants will need to complete an eligibility check. Please respond to the following two questions to help the NRCS begin the assessment.

1. Are you currently a participant in USDA Farm Programs? YES NO
2. Have you ever had, or do you currently have, an EQIP or CSP contract with NRCS? YES NO

Name _____

Address _____

County _____

Farm number (if known) _____

Tract number of field to be used for the study (if known) _____

Disclaimer: The Nebraska On-Farm Research Network does not endorse the use of products tested in on-farm replicated strip trials. While treatments are replicated within trials and may be replicated across multiple sites under various conditions, your individual results may vary.

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