Nebraska On-Farm Research Network

Maize-N Sidedress Recommendation vs. Grower's Choice Sidedress Recommendation

Protocol developed by: UNL Agronomy & Horticulture; Laura Thompson and Keith Glewen, UNL Extension Educators

Objective: Evaluate Maize-N as a tool to recommend in-season N rates.

Rationale: Applying a portion of total N fertilizer during the growing season has been shown to improve nitrogen use efficiency. There are a number of tools available for recommending in-season N rates. This project focus is on evaluating Maize-N as a tool for in-season N recommendation rates. Maize-N is a computer program developed at UNL that simulates fertilizer requirement for corn. The estimation of N fertilizer requirement in Maize-N is based on user input information on the current corn crop, last season crop, tillage, crop residue management, basic soil properties, fertilizer management, and long-term weather data of the field. The program first simulates corn yield potential and its year to year variation. It then simulates mineral N released from mineralization of soil organic matter, crop residues, and manures. Finally, it estimates the economically optimal N rate of fertilizer to apply. Learn more about Maize-N here: http://hybridmaize.unl.edu/maizen.shtml.

Procedure: Sidedress application can be an especially efficient N management component if pre-plant application does not exceed 75 lb N/acre. This should supply adequate N until sidedress application while leaving a significant amount of N to be applied in-season. For help in determining the Maize-N recommendation for your field, please contact Laura Thompson (laura.thompson@unl.edu or 402-624-8033). Maize-N can be purchased for $35.00 from the UNL marketplace (http://marketplace.unl.edu/nutechmarketplace/software/maize-n.html). Long term weather files required for Maize-N for a location near you can also be obtained by contacting Laura Thompson. This trial does not require a guidance system or yield mapping capabilities but these are preferred.

The Maize-N recommended rate is compared to the grower determined in-season N rate. The two treatments in these trials are:

Treatment 1: Maize-N Sidedress Rate
Treatment 2: Producer Sidedress Rate (This is a rate determined by the producer. A number of different strategies may be used to determine this rate such as the pre-sidedress nitrate test, UNL N recommendation algorithm, or an N rate determined by another available model or tool.)

Treatment Design: The paired comparison design is used for this trial. A total of 7 replications should be implemented and harvested. The same hybrid and management practices (other than N) should be used across the entire study area.

***NOTE!** When designing a nitrogen comparison you need to remember nitrogen is a mobile nutrient and corn roots will spread laterally (i.e. corn plants can take up N from up to a row away). Therefore, the width of the treatment strips shown below must take this into account and compensate for it. We compensate for this by allowing for a "buffer" between the different treatments. This "buffer" area is not used for the yield comparison. For example, if you have a 16 row nitrogen applicator and an 8 row corn head, you will need to harvest the center 8 rows of each 16 row treatment, leaving 4 rows on each side of each treatment strip as "buffer". This area will be harvested but not included in the yields for statistical analysis of the treatments. The following layout demonstrates a 16 row applicator and 8 row corn head. If you have different equipment sizes you will need to adjust accordingly. If you have any questions about the treatment design when working with N, please contact the Nebraska On-Farm Research Network.

Replication	N Application	Harvest
Rep 1	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 2	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 3	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 4	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 5	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 6	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
Rep 7	(16 rows) Treatment 1: Maize-N sidedress recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*
	(16 rows) Treatment 2: Producer's sidedress N recommendation	←*4 rows buffer*
		← **Record Yield** from center 8 rows
		←*4 rows buffer*

Grower Requirements:

1. Flag or **mark** GPS location of each treatment.
2. Provide all necessary **inputs** for crop production.
3. Complete a **background** agronomic form about site and practices.
4. Collect **yield data** and **grain moisture** with weigh wagon or yield monitor. If using yield monitor, please designate a separate "load" for each treatment and set up separate "products" names for each treatment harvested. Yield monitor must be **well calibrated**. Contact UNL Extension if assistance with this process is needed (visit http://cropwatch.unl.edu/farmresearch for contact info).
5. Collect stand counts at harvest. Each treatment in all replications should have a stand count recorded. It is recommended that at least 3 counts be averaged together for each reported stand count.
6. Submit harvest data to UNL Extension within 30 days of harvest or by Dec. 15 of the harvest year.
7. Allow UNL Extension to use submitted and collected data for research, educational, and informational purposes.

Nebraska On-Farm Research Network will:

1. Provide technical assistance in setting up replicated and randomized experimental design.
2. Provide assistance upon request with treatment implementation, flagging, stand counts, stalk rot tests, and recording yield.
3. Analyze raw data using statistical analysis and provide this information to the grower.

For assistance with studies, please contact the Nebraska On-Farm Research Network Coordinators:
Keith Glewen: kglewen1@unl.edu or 402-624-8005
Laura Thompson: laura.thompson@unl.edu or 402-624-8033
Or your local Extension Educator