HIGH INPUT CORN MANAGEMENT

TRIAL OVERVIEW

- Every year, farmers question which inputs will give the highest return on their investment. To assist farmers with these decisions, a high input corn study was set up to evaluate the potential benefits of various inputs.

Treatment	Fertility	Planting density (seeds/acre)	Fungicide
Normal management (NM)			
Base NM	180 lb/acre N at planting with coulter 60 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn at planting with strip tillage	32K	None
Increased planting density	180 lb/acre N at planting with coulter 60 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn at planting with strip tillage	**38K**	None
Reduced fertility (S and Zn)	180 lb/acre N at planting with coulter 60 lb/acre P at planting with strip tillage **No S or Zn applied**	32K	None
Split N application	**100 lb/acre N applied pre-plant with strip tillage, 80 lb/acre N sidedress injected at V7** 60 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn at planting with strip tillage	32K	None
Added fungicide	180 lb/acre N at planting with coulter 60 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn at planting with strip tillage	32K	**10 fl oz/acre Headline® AMP applied at VT**
Intensive management (IM)			
Base IM	Split N: 160 lb/acre N applied pre-plant with strip tillage, 80 lb/acre N sidedressed at V7 90 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn applied with strip tillage	44K	10 fl oz/acre Headline AMP applied at VT
Decreased planting density	Split N: 160 lb/acre N applied pre-plant with strip tillage, 80 lb/acre N sidedressed at V7 90 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn applied with strip tillage	**38K**	10 fl oz/acre Headline AMP applied at VT
Reduced fertility	Split N: 160 lb/acre N applied preplant with strip tillage, 80 lb/acre N sidedressed at V7 90 lb/acre P applied with strip tillage **No S or Zn applied**	44K	10 fl oz/acre Headline AMP applied at VT
N applied all upfront	**240 lb/acre N applied with strip tillage** 90 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn applied with strip tillage	44K	10 fl oz/acre Headline AMP applied at VT
No fungicide	Split N: 160 lb/acre N applied pre-plant with strip tillage, 80 lb/acre N sidedressed at V7 90 lb/acre P, 25 lb/acre S, and 0.5 lb/acre Zn applied with strip tillage	44K	**None**

Highlighted text indicates difference from previous treatment. N = nitrogen, P = phosphorus ($P_2 0_5$), S = sulfur, Zn = zinc

Table 1. Treatment list

RESEARCH OBJECTIVE

- To determine which inputs maximize irrigated corn yields and economic return.

Location	Soil	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield/Acre	Planting Rate/Acre
Gothenburg, NE	**Hord silt loam**	**Soybean**	**Strip tillage**	**04/20/2017**	**10/26/2017**	**280 bu/acre**	**32K, 38K, 44K**

SITE NOTES:

- This study consisted of low input (normal management, NM) and high input (intensive management, IM) base treatments with different inputs added or removed (Table 1).
- Three corn products were assessed: one 116 RM corn product and two 114 RM corn products. Each product was tested with each treatment totaling 30 treatments.
- Treatments were randomized with four replications.
- Weeds were managed uniformly across the study and no insecticide was applied.
- Soil test: organic matter 3.0%, pH 6.6, nitrogen (N) - 40 lbs/acre residual in 2 ft., phosphorus (P) - 39 ppm MP3, sulfur (S) - 26 ppm, zinc (Zn) - 2.0 ppm.
- Plants that died prematurely, green-snapped plants, stalk-lodged plants, and root-lodged plants per plot were recorded prior to harvest.

UNDERSTANDING THE RESULTS

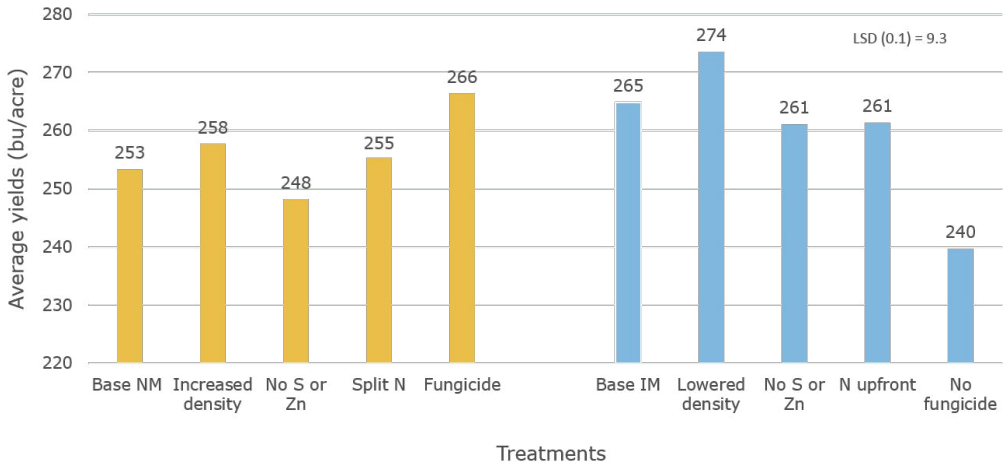

Figure 1. Average corn yields in the different treatments

- **Yields**
- Individual corn products did not respond differently to treatments so results are summarized across treatments.
- A fungicide application at VT provided the most value in terms of yield.
  - When added, the fungicide application increased yield by 13 bu/acre over the base NM system.
  - When the fungicide application was removed from the base IM system, yields decreased by 25 bu/acre.
  - A fungicide application at VT also increased yields in 2015 and 2016 demonstration trials as documented in previous Learning Center Reports.
- Neither the split N application nor additional S and Zn significantly affected yields.
  - In a 2015 Learning Center Report, adding S and Zn increased yields.
  - In a 2017 Learning Center Report, a split application of N increased yield when applied through a subsurface drip irrigation system.
  - The soil in this trial had relatively high fertility levels based on the soil test, indicating that corn products may not respond much to additional fertility.
- Across the different seeding rates, 38,000 seeds/acre provided the best performance.
  - In a 2016 Learning Center Report, the 44,000 seeds/acre rate increased yield significantly.
- **Plant Quality**
- No differences were observed across treatments for green-snapped plants, plants that died prematurely, or stalk-lodged or root-lodged plants.
- **Economics**
- When using current corn prices of $3.00/bu, the treatment that provided the highest return over investment was the NM plus fungicide treatment. If corn prices increase, this treatment would continue to provide the greatest economic advantage up to a corn price of $9.00/bu.
- For the IM options, the IM without fungicide treatment would cost the farmer close to $140/acre relative to the NM plus fungicide treatment.

WHAT DOES THIS MEAN FOR YOUR FARM?

- Farmers should consider using a fungicide application at the VT growth stage as it has consistently provided value across multiple corn products and multiple years.
- Increasing seeding rate can increase yield and provide more value to the farmer as long as the seeding rate is increased on an appropriate corn product. Please consult your local seed sales team for individual corn product seeding rate recommendations.
- The value of other inputs, such as a split N application or additional S and Zn, have been more variable over the years.