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.

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Soil</th>
<th>Previous Crop</th>
<th>Tillage Type</th>
<th>Planting Date</th>
<th>Harvest Date</th>
<th>Potential Yield/Acre</th>
<th>Planting Rate/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gothenburg, NE</td>
<td>Hord silt loam</td>
<td>Soybean</td>
<td>Strip tillage</td>
<td>04/20/2017</td>
<td>10/26/2017</td>
<td>280 bu/acre</td>
<td>32K, 38K, 44K</td>
</tr>
</tbody>
</table>

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.

Table 1. Treatment list

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UNDERSTANDING THE RESULTS

**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.
LEGAL STATEMENT

The information discussed in this report is from a single site, replicated demonstration. This information piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

For additional agronomic information, please contact your local brand representative. Developed in partnership with Technology Development & Agronomy by Monsanto.

**Important:** Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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