New Technologies: Products and Additives

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Evaluation Of New Technologies

- **We Should Be Somewhat Skeptical**
  - Has The Company Invested In Product Research?
    - Research with Universities, Private Contractors and In-House Personnel
  - Does It Make Sense?
    - But Keep In Mind That New Ground Has Is Continually Being Broken
  - Is It Benefiting from Past Inputs/Management?
    - For Example, Nutrient Soil Tests That Have Been Previously Been Built
Evaluation Of New Technologies

• We Should Also Be Open Minded, Willing To Sometimes Change Our Ingrained Viewpoints and Progressive

  ▪ Everything Is New At Some Time
    ▪ Internet, N-Serve, GPS, Fungicides
  ▪ Things Are Not Necessarily The Same As Before
    ▪ Yield Levels Are Much Higher
  ▪ Companies Invest Huge Amounts Of Dollars In Research and Development
    ▪ Research with Universities, Private Contractors and In-House Personnel
Relationship between Bray P and relative corn yield in three long-term Iowa studies over 30 years

Consistency?
Corn Nitrogen Rate Calculator

Finding the **Maximum Return To N** and Most Profitable N Rate
A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines

**Iowa**
C/S Rotation
28% UAN @ $350/ton
Corn @ $4.00/bu

<table>
<thead>
<tr>
<th>MRTN Rate (lb N/acre)</th>
<th>110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitable N Rate Range (lb N/acre)</td>
<td>99 - 122</td>
</tr>
<tr>
<td>Net Return to N at MRTN Rate ($/acre)</td>
<td>$130.02</td>
</tr>
<tr>
<td>Percent of Maximum Yield at MRTN Rate</td>
<td>98%</td>
</tr>
<tr>
<td>UAN (28% N) at MRTN Rate (lb product/acre)</td>
<td>393</td>
</tr>
<tr>
<td>UAN (28% N) Cost at MRTN Rate ($/acre)</td>
<td>$69.30</td>
</tr>
</tbody>
</table>

Most profitable N rate is at the maximum return to N (MRTN).
Profitable N rate range provides economic return within $1/acre of the MRTN.
Consistency and/or Predictability?
Enhanced Efficiency N Products

• It is important to understand ..........
  – How different modes of action should be used with different loss mechanisms
  – Where and when benefits are possible

• In some cases, benefits may not occur unless specific conditions are met

• Enhanced efficiency products are one potential answer
Fate of N Fertilizers

Volatilization

\[ \text{Urea} \rightarrow \text{NH}_3 \rightarrow \text{NH}_4^+ \]

\[ \text{UAN} \rightarrow \text{NH}_4\text{NO}_3 \rightarrow (\text{NH}_4)_2\text{SO}_4 \]

Denitrification

\[ \text{Nitrification inhibitors} \]

\[ \text{Instinct Nutrisphere ESN*} \]

\[ \text{Agrotain Nutrisphere ESN*} \]

Urease inhibitors

Leaching
Uncoated, Slowly Available Compounds

- Protect N by delaying N availability
- Generally rely on biochemical decomposition
- Protection time typically weeks to months
- Release rate determined by
  - Chemical structure (resistance to breakdown)
  - Molecular weight/degree of polymerization
  - Environmental conditions
- Release slow but generally uncontrolled

Methylene Ureas, Urea Formaldehydes, Triazone, etc.
Triazone, Methylene Urea, Urea Formaldehyde, etc.

N-Sure®
N-Pact
GRADUAL-N

K. Nelson, P. Motavalli and B. Burdick
University of Missouri
Agrotain (NBPT)

• Disrupts urease activity from 7 to 14 days and decreases potential volatilization loss.

✓ Primary use is on surface applied urea

✓ Combined with DCD (Agrotain Plus/Super U) slows nitrification when urea or UAN are incorporated into soil.
**1994 Nitrogen Source Study on No-till corn, Poplar Hill Research and Education Facility, University of Maryland**

No-till corn into a small grain (wheat) double cropped soybean stubble. All liquid materials were broadcast between rows when corn was 12" tall.

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>YIELD BU/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check P&amp;K only</td>
<td>77.5</td>
</tr>
<tr>
<td>Urea (46-0-0)</td>
<td>150.5</td>
</tr>
<tr>
<td>Urea with AGROTAINT</td>
<td>176.5</td>
</tr>
<tr>
<td>30% UAN Solution Broadcast</td>
<td>166.9</td>
</tr>
<tr>
<td>30% UAN Solution Injected</td>
<td>173.9</td>
</tr>
<tr>
<td>UAN with AGROTAINT</td>
<td>182.3</td>
</tr>
<tr>
<td>UAN with AGROTAINT &amp; DCD</td>
<td>173.7</td>
</tr>
<tr>
<td>UAN with 8-0-0-9 (ammonium sulfate)</td>
<td>185.4</td>
</tr>
<tr>
<td>SuperU</td>
<td>176.8</td>
</tr>
</tbody>
</table>

F. R. Mulford, Maryland
Utilization of AGROTAIN Treated Urea In A Corn Cropping System In Alabama

AUBURN UNIVERSITY (ALABAMA) - C. W. Wood, C. G. Cummings, R. Duffield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N Rate (lb/acre)</th>
<th>Yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGROTAIN Urea</td>
<td>110.8</td>
<td>116.0</td>
</tr>
<tr>
<td>Urea</td>
<td>102.1</td>
<td>107.3</td>
</tr>
<tr>
<td>Ammonium Nitrate</td>
<td>98.8</td>
<td>99.0</td>
</tr>
</tbody>
</table>
Experiments were established at two Illinois locations to evaluate the effect of N rate and AGROTAIN on the N concentration of ear leaf corn samples collected at tasseling and on corn yield at maturity when applied with urea and UAN solutions. N treatments were 0, 80, 120, 160, and 200 lb/acre N. Due to an abnormally wet spring and summer, treatment applications were delayed in hopes of finding a rain-free period. Summary: Limited yield response associated with the surface applications and receipt of rain (1.65”) within 5 days of applications did not allow the AGROTAIN an opportunity to express its effectiveness as a Nitrogen Stabilizer. Out of 8 NBPT comparison, it significantly increased yield at 2,120 lb/acre N (+14) and 200 lb/acre N (+20.5).

<table>
<thead>
<tr>
<th>N Source</th>
<th>120 lb/acre N</th>
<th>200 lb/acre N</th>
<th>yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGROTAIN Urea</td>
<td>120.9</td>
<td>131.4</td>
<td></td>
</tr>
<tr>
<td>Urea</td>
<td>106.8</td>
<td>110.9</td>
<td></td>
</tr>
<tr>
<td>Advantage</td>
<td>+14.1</td>
<td>+20.5</td>
<td></td>
</tr>
</tbody>
</table>
Effects of N source on corn grain yield with 80 + 80 lb split applied N/ac; Scandia, Kansas, 2004

Source: Kansas State University Agronomy Field Research, Irrigation and North Central Kansas Experimental Field.
• Polymer coatings applied to soluble fertilizer
• Release by diffusion through coating
• Release rate determined by
  – Polymer chemistry, thickness, coating process
  – Temperature and moisture
• Controlled release vs delayed release
Comparisons of pre-plant PCU with urea and UAN at equal N rates

247 total Comparisons

< 0 - 26%

> 0 - 71%

= 0 - 3%

PCU > Urea and UAN

Compilation of data from source-rate studies and trials in the US Corn Belt, 2000-2005
A. Blaylock, personal communication
Hancock, WI, July 8
Sandy soils + excessive rain

ESN 100 #N/ac
Pre-plant 147 bu/ac

AS 150 #N/ac
Pre-plant 126 bu/ac
Variable-Source N Fertilization
Greenley, MO, 2005

Corn yield (bu/acre)
No N
Urea
ESN

N applied before planting (mid-April) at 150 lbs N/ac

Instinct

Encapsulated *Nitrapyrin* for use with urea ammonium nitrate (UAN) and liquid manure
NutriSphere-N

- Thought to complex multivalent cations removing them from biochemical processes.
  - Combines with Ni to reduce urease activity.
  - Combines with Fe and Cu to reduce micro-organism metabolic activity delaying nitrification.
Effect Of NSN On Urea N Volatilization - Laboratory Study
M. Cabrera, Univ. Georgia

Percent of Urea N Volatilized

Days After Application

R² = 0.96

Urea + NSN
Urea
**Biomass R1: Pamlico County - 2009**

- **Biomass, (lbs acre**$^{-1}$**)**
- **N Applied (lb N acre**$^{-1}$**)***

- Yellow line: UAN at Plant
- Green line: UAN+Nutrisphere at Plant
- Red line: UAN at Sidedress
- Blue line: UAN+Nutrisphere at Sidedress

The graph shows the relationship between N applied (lb N acre$^{-1}$) and biomass (lbs acre$^{-1}$) for different nitrogen application methods in Pamlico County, North Carolina, in 2009.
NUTRISPHERE-N EFFECTS ON DRYLAND CORN

Clemson University

Yields limited by moisture stress.

Grain yield, Bu/acre

N rate, lb/acre

R² = 0.89

R² = 0.93

UNIVERSITY OF MARYLAND

80 Urea

80 Urea + Nutrisphere

80 Urea

STRIP TILL

Urea

Urea + NSN

UNIVERSITY OF MARYLAND
N Source and Nutrisphere Effect on Corn Yield
F. Yin, Univ. of Tennessee, 2009

<table>
<thead>
<tr>
<th>N Rate</th>
<th>Urea</th>
<th>Urea + N-N</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>121</td>
<td>124</td>
<td>123</td>
</tr>
<tr>
<td>150</td>
<td>131</td>
<td>139</td>
<td>135</td>
</tr>
<tr>
<td>180</td>
<td>142</td>
<td>153</td>
<td>148</td>
</tr>
<tr>
<td>Average</td>
<td>132</td>
<td>139</td>
<td></td>
</tr>
</tbody>
</table>

Nutrisphere p > f < 0.07
N Rate p > f < 0.05
### N Source and Nutrisphere Effects On Corn Yield

**S. Ebelhar and C. Hart, Univ. of Illinois, 2009**

<table>
<thead>
<tr>
<th>Nutrisphere</th>
<th>Corn Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>No 133</td>
</tr>
<tr>
<td>Urea</td>
<td>No 191</td>
</tr>
<tr>
<td>Urea</td>
<td>Yes 198</td>
</tr>
<tr>
<td>UAN</td>
<td>No 193</td>
</tr>
<tr>
<td>UAN</td>
<td>Yes 200</td>
</tr>
<tr>
<td>Amm. Sulfate</td>
<td>No 228</td>
</tr>
<tr>
<td>Amm. Sulfate</td>
<td>Yes 238</td>
</tr>
<tr>
<td>Amm. Sulfate-Nitrate</td>
<td>No 227</td>
</tr>
<tr>
<td>Amm. Sulfate-Nitrate</td>
<td>Yes 237</td>
</tr>
</tbody>
</table>

**p > f < 0.01**

Without Nutrisphere: 210
With Nutrisphere: 218

**p > f < 0.05**

Urea: 194
UAN: 196
Amm. Sulfate: 233
Amm. Sulfate-Nitrate: 232

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“…. The N sources of AN, AS, ASN all resulted in significantly higher yields than the urea or UAN sources. The addition of Nutrisphere-N to the N sources increased yields by 8.5 bu/a on average across N rates and sources. The addition of Nutrisphere-N to AS and ASN gave both an agronomic and economic response. Higher yields with S containing fertilizers point to a need for considering S in corn fertilization programs.”

*S.A. Ebelhar & C.D. Hart*
# N Source and Nutrisphere Effect on Corn Yield

F. Yin, Univ. of Tennessee, 2009

<table>
<thead>
<tr>
<th>N Source</th>
<th>Without Nutrisphere</th>
<th>With Nutrisphere</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Sulfate</td>
<td>168</td>
<td>172</td>
<td>170</td>
</tr>
<tr>
<td>Ammonium Nitrate</td>
<td>164</td>
<td>170</td>
<td>167</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>166</td>
<td>171</td>
<td></td>
</tr>
</tbody>
</table>

**Nutrisphere** \( p > f \) < 0.05
Effect of N Source On Irrigated No-till Corn

Gordon. KSU Fertilizer Report. 2010. 3-year average

N applied broadcast preplant
Average across 3 rates (80, 160, 240 lb/A)
MicroEssentials granules, containing N, P, S and Zn (SZ), eliminate component segregation to ensure uniform distribution of nutrients.
Soybean Yield Results

Four-Year Fertility Study
21 locations
Locations: IA, IL, IN, MN, SD, NE, ND, WI, ON, MB

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield --- bu/acre ---</th>
<th>ME SZ Advantage --- bu/acre ---</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicroEssentials SZ</td>
<td>53.7</td>
<td></td>
</tr>
<tr>
<td>MAP</td>
<td>48.7</td>
<td>+ 5.0</td>
</tr>
<tr>
<td>DAP</td>
<td>48.2</td>
<td>+ 5.5</td>
</tr>
</tbody>
</table>

Note: Nutrient rates equalized across plots for each year.
$P_2O_5$ rate: 40 lbs/acre
All differences are significant at the 0.1 level
Corn Yield Results

Seven Year Study – Fertility trials only
62 locations
Locations: IA, IL, IN, MN, SD, MO, NE, ND, TX, WI, ON, MB

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield --- bu/acre ---</th>
<th>ME SZ Advantage --- bu/acre ---</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicroEssentials SZ</td>
<td>164.6</td>
<td></td>
</tr>
<tr>
<td>DAP (Check)</td>
<td>157.7</td>
<td>+ 6.9</td>
</tr>
</tbody>
</table>

Note: Nutrient rates equalized across plots for each year.  
$P_2O_5$ rate: 70 lbs/acre
## Corn Yield Results

### One Year Fertility Study
19 locations
Locations: IA, IL, IN, MN, SD, MO, NE, WI, ON, MB

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>ME SZ Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicroEssentials SZ</td>
<td>155.9</td>
<td></td>
</tr>
<tr>
<td>DAP + ZnSO4 (Zn @ 1.8 #/a)</td>
<td>149.2</td>
<td>+ 6.7</td>
</tr>
<tr>
<td>DAP + ZnSO4 (Zn @ 5 #/a)</td>
<td>153.2</td>
<td>+ 2.7</td>
</tr>
<tr>
<td>DAP (Check)</td>
<td>150.6</td>
<td>+ 5.3</td>
</tr>
</tbody>
</table>

Note: Nutrient rates equalized across plots for each year.
Zn @ 1.8 #/a equals zinc rate in MESZ
Zn @ 5 #/a represents farmer rate
P₂O₅ rate: 70 lbs/acre
DAP in storage

MESZ in storage
MicroEssentials SZ for complete soil coverage

Typical Zinc Blend

- Zinc as granules in **bulk blend** through **broadcast** application (5 lbs/A Zn).
- 0.66 granules/sq ft

MicroEssentials SZ

- Zinc incorporated in phosphate fertilizer (65 lbs/A P$_2$O$_5$ and 1.6 lbs/A Zn).
- 8.0 granules/sq ft
Soil Zn:
MESZ improves Zn distribution

There was no difference between MESZ and the blend on soil available Zn. MESZ resulted in a significantly more uniform Zn distribution compared to the blend, even at 1/5 of the Zn rate.

Letters indicate significant differences (p<0.1)
P fertilizer application increased P uptake.

MESZ increased P uptake by 17% compared to the blend.

Letters indicate significant differences (p<0.1)
• An extremely high cation exchange capacity – about 1800 meq/100 gms.
• Structure is very specific to attracting and adsorbing multivalent cations.
• Functionality is not affected by pH, temperature ranges or ionic strength.
• Biodegradable and water soluble.
• Polymer affects only very small portion of soil volume
AVAIL Slows Initial Contact With Soil “Impurities”

Hard water + AVAIL + 10-34-0

[AVAIL] = 0.5% v/v

What Is A Main Advantage Of Banding?
Aluminum Effects on Wheat - Low pH: 4.5

- No AVAIL®
  - 0 umol Al
  - 200 umol Al
  - 400 umol Al

- With AVAIL®
  - 0 umol Al
  - 200 umol Al
  - 400 umol Al

Koenig, Washington State
Avail Effects on Corn Grain Yield
2001-2003 Kansas

Barney Gordon, KSU

KANSAS STATE UNIVERSITY
2006

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain Yield, bu/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avail SD</td>
<td>208</td>
</tr>
<tr>
<td>FLUID STARTER</td>
<td>192</td>
</tr>
<tr>
<td>NO AVAIL</td>
<td>171</td>
</tr>
<tr>
<td>8 gal 10-3 i-0</td>
<td>174</td>
</tr>
</tbody>
</table>

Leikam AgroMax
Improving Early Growth and Stress Tolerance

Differences in Root Mass - 2007

Root Mass, oz

10-27-0
10-27-0 + Avail
17-17-0
17-17-0 deep band
no starter

Pamlico07
Currituck07

Department of Crop Science
College of Agriculture and Life Sciences
Initial Precipitate Results
Staggenborg, KSU

Precipitate % Of Test Average

Fertilizer Product

6--24--6
9--18--9
10--34--0
28--0--0
Tech MAP

No Avail
1% Avail
2% Avail
### N Source and Avail Effects On Subsurface Drip Irrigation Applied Fertilizer

S. Staggenborg and J. Olson, Kansas State Univ., 2009

<table>
<thead>
<tr>
<th>Subsurface Drip Irrigation Treatments</th>
<th>With Starter</th>
<th>Without Starter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>196</td>
<td>195</td>
</tr>
<tr>
<td>6-24-6</td>
<td>213</td>
<td>203</td>
</tr>
<tr>
<td>6-24-6 + Avail</td>
<td>226</td>
<td>200</td>
</tr>
<tr>
<td>9-18-9</td>
<td>200</td>
<td>194</td>
</tr>
<tr>
<td>9-18-9 plus Avail</td>
<td>211</td>
<td>204</td>
</tr>
</tbody>
</table>

**LSD** (0.05) = 11.0
# Effect Of Avail On Corn Growth

*Univ. of Minnesota, 2002, 2003*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2002</th>
<th>2003</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>136</td>
<td>195</td>
<td>686</td>
<td>352</td>
</tr>
<tr>
<td>DAP</td>
<td>153</td>
<td>196</td>
<td>658</td>
<td>422</td>
</tr>
<tr>
<td>DAP + Avail</td>
<td>173</td>
<td>199</td>
<td>806</td>
<td>395</td>
</tr>
<tr>
<td><strong>p &gt; f</strong></td>
<td>0.02</td>
<td>0.53</td>
<td>0.04</td>
<td>0.24</td>
</tr>
</tbody>
</table>

* *p > f* for treatment effect
JumpStart

Biologicals \> Products \> Agriculture \> Bio-fertility \> JumpStart \> Detail

JumpStart is a fertility management tool applied as a seed treatment prior to seeding.

It colonizes plant roots and makes the bound mineral forms of less available soil phosphate immediately available for crop use. The result is higher crop yields and a better return on your fertilizer investment.

**How Does it Work?**

The soil fungus in JumpStart colonizes a plant root as it thrives on the root exudates. As the fungus grows and multiplies it produces acids that break the bonds that are holding phosphate in mineral forms that are not available to the plant.

JumpStart helps manage your phosphate fertility on any crop by making better use of your current and past investments in phosphate fertilizer.

JumpStart, the phosphate inoculant, contains the naturally-occurring soil fungus *Penicillium bilaii*. It colonizes plant roots and makes the ‘fixed’ mineral forms of less available soil phosphate immediately available for crop use.

JumpStart promotes greater phosphate use efficiency, which results in quick emergence, early vigor, greater stress tolerance, and more even maturity. JumpStart delivers a safe method of supplying phosphate to growing plants and reduces the need to seed-place high rates of fertilizer phosphate with crops needing long-term use and in silico.
Wolf Trax

DDP Research Results
Wolf Trax has an extensive research and evaluation program, spanning different countries, crops, soils and climatic conditions. The tool below allows you to sort through our database, to find results relevant to your specific needs.

This Month's Focus
Wolf Trax DDP Micronutrients and the Nutrient Rate

1. From the menus to the right, select the 3 required criteria.
2. You also have the option to filter by crop type, soil type and/or pH range.
3. Click "Show Results" to create a bar chart (which will be shown below) comparing Wolf Trax DDP to the untreated check (UTC).
4. If you wish to create a new bar chart by changing only one single criteria you must click on the appropriate drop down box, choose Show All, re-choose a new criteria, and then click Show Results.
5. If you wish to start over completely, click New Search.

Available Results

Results:
Fertilizer Coating \ Zinc DDP \ Plant Tissue Uptake \ Corn

Test Results as Percent of Untreated Check

Tissue sampling showed that Wolf Trax Zinc DDP delivered 10.0% more micronutrient to the plant than the untreated check. This demonstrates that a Fertilizer Coating application of Wolf Trax Zinc DDP can correct deficiencies, ensuring that the crop can gain access to the micronutrients it needs.
2008 Corn Seed Treatment
Burwell Ne. 1.7 ppm DTPA ZN Sandy Loam soil

Winfield Solutions & Croplan Genetics

ZINC SEED TREATMENT
ADVANCED COATING® ZN
ENHANCES SEED CORN WITH ZINC FOR EARLY SEEDLING VIGOR AND BETTER PLANTABILITY.

Graph showing yield comparison:
- Check
- Max in-ZMB
- Adv ZN
- Adv ZN + ZMB

Yield in bu/a:
- Check: 190 bu/a
- Max in-ZMB: 210 bu/a
- Adv ZN: 220 bu/a
- Adv ZN + ZMB: 230 bu/a

Hybrid 1 (blue) and Hybrid 2 (gray) are compared across treatments.
## Higher Nutrient Levels Required For Plant Population Response

**Kansas State University**

<table>
<thead>
<tr>
<th>Plant Population</th>
<th>Traditional $^1$</th>
<th>Enhanced $^2$</th>
<th>Corn Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fertility</td>
<td>Fertility</td>
<td></td>
</tr>
<tr>
<td>28,000</td>
<td>202</td>
<td>225</td>
<td>23</td>
</tr>
<tr>
<td>42,000</td>
<td>196</td>
<td>262</td>
<td>66</td>
</tr>
<tr>
<td>Response</td>
<td>-6</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

$^1$ 230 lb N/a, 30 lb P$_2$O$_5$/a  

$^2$ 230 lb N/a, 100 lb P$_2$O$_5$/a, 80 lb K$_2$O/a and 4C

- $P$ and $K$ Soil Tests = High
## Interaction Of New Technologies/Practices With Corn Yield

**University of Illinois and Mosaic**

<table>
<thead>
<tr>
<th></th>
<th>Traditional Program</th>
<th>Enhanced Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>208 bu/a</td>
<td>274 bu/a</td>
</tr>
<tr>
<td><strong>Yield Increase Attributed To Individual New Practice:</strong></td>
<td>- - - - - - - bu/a</td>
<td>- - - - - - -</td>
</tr>
<tr>
<td>Additional P, S, Zn (MEZ)</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Additional Sidedress N</td>
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<td>Higher Plant Population</td>
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<tr>
<td>Fungicide Application</td>
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<td>Genetics - Triple Stack</td>
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*Traditional Program - University of Illinois Recommendations Without Any Enhanced Input*  
*Enhanced Program - University of Illinois Recommendations Plus All Enhanced Inputs*
New Technologies: Products and Additives

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