2010-2011 Winter Wheat Trials
Yield and Protein Results

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• Slow Release Study
• Foliar N Study
• Avail Study
• P1000
## Slow Release Study

- Two Trials @ Lake Carl Blackwell
  - 1 conventional tillage
  - 1 no-till

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Source</th>
<th>Pre-plant N kg/ha</th>
<th>Top N kg/ha</th>
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<tbody>
<tr>
<td>1</td>
<td>Check</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Urea</td>
<td>56</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Urea</td>
<td>84</td>
<td>0</td>
</tr>
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<td>4</td>
<td>Urea</td>
<td>112</td>
<td>0</td>
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<td>5</td>
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<td>6</td>
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<td>7</td>
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<tr>
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<td>Nutrisphere</td>
<td>56</td>
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<td>Nutrisphere</td>
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<td>112</td>
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</tr>
<tr>
<td>11</td>
<td>Urea/Urea+Agrotain</td>
<td>28</td>
<td>56</td>
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<tr>
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<tr>
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<tr>
<td>14</td>
<td>Urea/Urea</td>
<td>28</td>
<td>84</td>
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Statistical Evaluation

- Across Trial: all treatments are compared to each other.
- By Source: Only treatments with the same source are evaluated.
- By Rate: Only treatments receiving the same rate are evaluated.

Example of Evaluation Slow Release by Rate:
- 3 groups are created, Pre, Flagleaf and Post Anthesis.
- Comparisons
  - Trts: 1, 2
  - Trts: 3, 4, 5, 6, 7, 8
  - Trts: 9, 10, 11, 12, 13, 14
Slow Release “Conven” YLD

There was no significant yield benefit of using a product or additive compared to UREA at the same rate.
Slow Release “Conven” Protein
Slow Release “Conven” Soil N

Slow Release 2011 Conventional

Slow Release 2011 Conventional

Residual NO3 lbs ac⁻¹

Residual NO3 lbs ac⁻¹
Slow Release “No-till” YLD

There was no significant yield benefit of using a product or additive compared to UREA at the same rate.
Slow Release “No-till” Protein
Slow Release “No-till” Soil N

Slow Release 2011 No-till

Residual NO3 lbs ac⁻¹

Check | Urea 50 | Urea 75 | Urea 100 | ESN 50 | ESN 75 | ESN 100 | Nitrosphere 50 | Nitrosphere 75 | Nitrosphere 100 | Urea/Urée Agroclin | Urée/Urée Agroclin | Urée/Urée | Urée/Urée
ESN Polymer-Coated Urea 44-0-0

GUARANTEED ANALYSIS
Total Nitrogen (N)* ----------------------------------------------- 44%

44.0% Urea Nitrogen

Derived from: polymer coated urea
*44.0% slowly available nitrogen from polymer coated urea.

Information regarding the contents and levels of metals in this product is available on the Internet at http://www.aspico.org/metals.htm

Net weight: ___________ (pounds) ___________ (kilograms)
NUTRISPHERE-N® for GRANULAR NITROGEN FERTILIZERS
Manages Nitrogen Volatilization and Nitrification

NUTRISPHERE-N® (N-N) for GRANULAR NITROGEN FERTILIZERS
is a polymer that manages and protects granular nitrogen fertilizers
by reducing volatilization and nitrification when applied with
granular nitrogen fertilizer to the soil.
Active ingredient - Minimum 43% butenedioic-methylenesuccinic
acid copolymer, partial Ca salt.

NUTRISPHERE-N® for GRANULAR NITROGEN FERTILIZERS IS
A NON-PLANT FOOD INGREDIENT, AND NOT RECOMMENDED
FOR USE AS A FERTILIZER SUBSTITUTE.

NOTICE:
NUTRISPHERE-N® for GRANULAR NITROGEN FERTILIZERS
works best when pre-coated onto urea that is to be applied to
the soil. When undisturbed NUTRISPHERE-N® prevents or reduces
volatilization and nitrification of urea. Do not use with liquid nitrogen
fertilizers or as a seed coating. Read MSDS, and label before use,
including but not limited to "Precautions" and "Warranty/Limitations
of Liability". Always wear proper personal protection and follow
instructions for treatment and application. Use according to label
directions.

SOIL TYPES AND CROPS:
NUTRISPHERE-N® is designed to reduce and insure against the
possibility of nitrogen losses from volatilization and nitrification.
NUTRISPHERE-N® may be used with any crop and in any soil type
where best management practices recommends the use of
nitrogen fertilizers.

MIXING INSTRUCTIONS:
NUTRISPHERE-N® should be evenly sprayed (impregnated), not
poured onto granular nitrogen fertilizers. Standard coating
equipment works well for coating granular nitrogen fertilizers. Do
Not Apply NUTRISPHERE-N® to granular nitrogen fertilizer that
is wet prior to treatment. If after treating with NUTRISPHERE-N®,
the granular nitrogen fertilizer is wet, allow to dry before use. To
prevent streaking a field, do not apply wet fertilizer. Up to 50
pounds of powdered clay per ton may be used to enhance drying.
Increasing air flow and ventilation will reduce drying time.

NUTRISPHERE-N® for GRANULAR NITROGEN FERTILIZERS
can be used with multiple types of granular nitrogen fertilizers.
However, the quality and composition of nitrogen fertilizers varies
greatly. Before coating NUTRISPHERE-N® for GRANULAR
NITROGEN FERTILIZERS on nitrogen fertilizers, those fertilizers
should be "batch tested" to determine compatibility with
NUTRISPHERE-N®. If wetness occurs, pre-treat to allow time for
drying. Do not blend urea or other nitrogen fertilizers that are wet.
Do not attempt to spread wet fertilizer as streaking may occur.
Ammonium Sulfate is often blended with urea treated with
NUTRISPHERE-N®. Before blending Ammonium Sulfate with
coated urea, do a "batch test" using the same ratio of Ammonium
Sulfate to coated urea intended to be used on a field. If wetness
occurs, reduce the amount of Ammonium Sulfate until wetness is
no longer an issue. For optimum results pretreat all nitrogen
fertilizer and allow drying before blending with other products.

Dye may be added to NUTRISPHERE-N® before application to the
fertilizer when treating urea. Success has been shown with
Hi-Light® Blue dye from Becker Underwood at the rate of 0.35
ounces to 0.50 ounces per gallon of NUTRISPHERE-N®
depending on the strength of the color desired. Dyes containing
metallic properties should not be used as they will interfere with the
effectiveness of the NUTRISPHERE-N®. Always jar test new dyes
to determine compatibility before using.

*316" stainless steel pumps and attachments are recommended.
When seals are used, seals made of "Gore-tex", "Teflon" or "Viton"
are required.

TREATMENT RATE:
NUTRISPHERE-N® for GRANULAR NITROGEN FERTILIZERS is
recommended to be coated at a rate of 0.25% or 1/2 gallon of
NUTRISPHERE-N® per ton of urea. (2.1 liters per metric ton)

APPLICATION RATES:
NUTRISPHERE-N® coated nitrogen fertilizer should be applied to
the soil in the same manner as nitrogen fertilizers without
NUTRISPHERE-N®. CAUTION: When using NUTRISPHERE-N®,
if different farming methods from those normally used are tried, test
strips are recommended until such new methods have been proven
to be effective.
AGROTAIN®
Improved Nitrogen Efficiency

Effective January, 2007

AGROTAIN® is a nitrogen stabilizer that delays the availability of nitrogen to the plant for up to 14 days by inhibiting the activity of the enzyme reductase.

**ACTIVE INGREDIENT**

Potassium phosphate boron (KPB), delivered as a 20% by weight solution of the active ingredient. The KPB is in a mixed salt formulation containing potassium phosphate (KPP), a non-nitrogenous salt, and borax.

**PRECAUTIONS**

Read the material safety data sheet before using this product.

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**CAUTION**

May Cause Allergic Skin Reaction, May Cause Eye and Skin Irritation. Do Not Take Internally.

Avoid contact with skin and eyes. Wear protective clothing, as necessary. Wash thoroughly after handling.

**FIRST AID**

In case of contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Wash clothing before reuse. In case of contact with eyes, flush eyes with plenty of water for at least 15 minutes. Call a physician or hospital poison center after contact with skin or eyes.

**INGESTION**

If swallowed, rinse 1 or 2 glasses of water. Immediately call a physician or a Poison Control Center and follow their advice. Do not induce vomiting or give anything by mouth to an unconscious person.

**PRODUCT FROM FREEZING**

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**Precautionary Statements**

**Warning:**

When using or handling this material, follow all precautions and warnings on the label and in the MSHA 30 Handbook. Use personal protective equipment in accordance with the MSHA 30 Handbook.

**Health Hazard:**

May cause skin and eye irritation. Wear protective clothing, as necessary. Wash thoroughly after handling.

**Environmental Hazards:**

Do not contaminate water, food or feed by storage or disposal. Dispose of equipment, containers and packing materials by incineration or in accordance with Federal, State and local regulations.

**Special Hazards:**

May cause skin and eye irritation. Use personal protective equipment in accordance with the MSHA 30 Handbook.
Foliar N

- Two trials 1 @ Lake Carl Blackwell 1 @ Lahoma
- All Trts Received 40lb N Pre
- All Trts but Check Received 50 lb N top-dress @ LCB
- All plots top-dressed @ Lahoma

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N-Rate kg ha</th>
<th>Source</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Standard Fertility Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6.7</td>
<td>UAN</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>4</td>
<td>13.4</td>
<td>UAN</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>5</td>
<td>26.8</td>
<td>UAN</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>6</td>
<td>6.7</td>
<td>Foliar</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>7</td>
<td>13.4</td>
<td>Foliar</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>8</td>
<td>26.8</td>
<td>Foliar</td>
<td>Flag Leaf</td>
</tr>
<tr>
<td>9</td>
<td>6.7</td>
<td>UAN</td>
<td>Post Anthesis</td>
</tr>
<tr>
<td>10</td>
<td>13.4</td>
<td>UAN</td>
<td>Post Anthesis</td>
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<td>26.8</td>
<td>UAN</td>
<td>Post Anthesis</td>
</tr>
<tr>
<td>12</td>
<td>6.7</td>
<td>Foliar</td>
<td>Post Anthesis</td>
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<td>13.4</td>
<td>Foliar</td>
<td>Post Anthesis</td>
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<tr>
<td>14</td>
<td>26.8</td>
<td>Foliar</td>
<td>Post Anthesis</td>
</tr>
</tbody>
</table>
Statistical Evaluation

• Across Trial: all treatments are compared to each other.
• By Source: Only treatments with the same source are evaluated.
• By Time: Only treatments applied at the same time are evaluated.
• By Rate: Only treatments receiving the same rate are evaluated.

Example of Evaluation Foliar N by Timing.
• 3 groups are created, Pre, Flagleaf and Post Anthesis.
• Comparisons
  • Trts: 1,2
  • Trts: 3,4,5,6,7,8
  • Trts: 9, 10, 11, 12, 13, 14
When all trts are evaluated across the trial the only difference in yld is between the check and Post UAN 12lb. When trts are evaluated by Source, Timing and Rate there was no Significance difference found.
Foliar N LCB Protein
When all trts are evaluated across the trial.
When trts are evaluated by Source, no Significance difference found
When trts are evaluated by Timing and Rate there was Significance difference found.

By Timing  Post CoRoN 6 > UAN 24
By Rate    6 lbs  CoRoN 6 Post > UAN 6 Flag
Foliar N Lahoma Protein
CoRoN®

25-0-0

CONTROLLED RELEASE NITROGEN
FOLIAR FERTILIZER

GUARANTEED ANALYSIS

Total Nitrogen (N) ... 25.00%

18.8% Urea Nitrogen
6.2% Other Water Soluble Nitrogen

Derived from urea, methylammonium diurea and methylene uras.

Chloride (Cl) not more than 1.0%

*4.5% Slowly Available Nitrogen from methylammonium diurea and methylene uras.

KEEP OUT OF REACH OF CHILDREN
CAUTION

USE WITHIN 9 MONTHS FROM DATE OF PURCHASE
See Inside Panel For Additional Precautionary Statements

SN 010/09/008

WEIGHT PER GALLON: 10.0 lbs. (4.54 kg)
NET CONTENTS: 2.5 gals. (9.46 L) Jug
2 x 2.5 gals. (2 x 9.46 L) Case

Information about the components of this lot of fertilizer may be obtained by writing to Helena Chemical Company, 225 Schilling Boulevard, Suite 300, Collierville, TN 38017 and giving the lot number which is found on the container.

Information regarding the contents and levels of metals in this product is available on the Internet at http://www.epa.gov/nopp滹h.htm.

F224
MANUFACTURED FOR
HELENA CHEMICAL COMPANY
225 SCHILLING BOULEVARD, SUITE 300
COLLIERVILLE, TN 38017
Avail Study

- Two trials 1 @ Lake Carl Blackwell 1 @ Lahoma
- All treatments received 40 lbs N pre and 40 lbs N
- Top dress

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<tr>
<th>Treatment</th>
<th>Pre-plant</th>
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<tr>
<td>1</td>
<td>Check 0 P, 12 lbs N</td>
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<tr>
<td>2</td>
<td>Broadcast DAP</td>
</tr>
<tr>
<td>3</td>
<td>Broad DAP+Avail</td>
</tr>
<tr>
<td>4</td>
<td>Band DAP</td>
</tr>
<tr>
<td>5</td>
<td>Band DAP+Avail</td>
</tr>
<tr>
<td>6</td>
<td>Band DAP</td>
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<td>7</td>
<td>Band DAP</td>
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<tr>
<td>9</td>
<td>Band DAP</td>
</tr>
<tr>
<td>10</td>
<td>Band DAP</td>
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</tbody>
</table>
Avail Study LCB Yld

LCB Avail

Yield bu ac⁻¹

No P  DAP  Braod  DAP + Band  Band  Band  Band  Band  Band  All

DAP  DAP  DAP + DAP  DAP  DAP  DAP  DAP  DAP  Band  DAP
Avail Study LCB Protein
Avail Study Lahoma Yld

Lahoma Avial

Yield Bu ac\(^{-1}\)

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<tr>
<th>Treatment</th>
<th>Yield Bu ac(^{-1})</th>
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<tr>
<td>No P</td>
<td>50.0</td>
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<tr>
<td>Broad DAP</td>
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<tr>
<td>Braod DAP+</td>
<td>30.0</td>
</tr>
<tr>
<td>Band DAP</td>
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<td>Band DAP</td>
<td>0.0</td>
</tr>
<tr>
<td>All Band DAP</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Avail Study Lahoma Protein
AVAIL®
For Granular Phosphate Fertilizers
Reduces Phosphate Fixation
(For Dry Products Only)

GUARANTEED MINIMUM ANALYSIS:
Mannicmannic Acid Copolymer .................................................. 40 %

AVAIL is a NON-PLANT FOOD INGREDIENT. It is not recommended for use as a fertilizer substitute.

PHYSICAL CHARACTERISTICS
Weight per gallon ........................................................................ 10.8
pH ........................................................................ 6 - 8

ADVANTAGES
1. AVAIL is designed for use with granular phosphate fertilizers, such as MAP, DAP and Triple Superphosphate to reduce phosphate fertilizer fixation.
2. AVAIL sequesters antagonistic ions such as iron, aluminum, calcium and magnesium that tie up phosphate in the soil surrounding the fertilizer, reduces tie-up of phosphate, and makes phosphate more available to the plant.
3. AVAIL increases phosphate availability through all stages of plant growth, including early development, the most crucial period for increasing yield potential.
4. AVAIL is water soluble, biodegradable and non-toxic.
5. Undisturbed, AVAIL continues to inhibit phosphate fixation throughout the growing season.

USES
1. For agricultural use only. Refer to the AVAIL label for mixing instructions and precautionary statements.
2. AVAIL is recommended for use at a rate of 1/4 gallon per short ton.
3. AVAIL coated fertilizers should be applied in the same manner and at the same rate recommended for phosphate fertilizer not coated with AVAIL. For specific application rates, follow the recommendation of a qualified individual or institution, such as, but not limited to, a certified crop advisor, agronomist, university crop extension publication, or apply according to your approved nutrient management plan.
4. Do not use AVAIL for Granular Phosphates with liquid phosphate fertilizer.

AVAIL is a Registered Trademark of Specialty Fertilizer Products, 134 Cherry Hill, Belton, MO
7771/Aval_70-3-85
P-1000

- P-1000 Product submitted by company for eval
- Plots received 30 lbs N pre and 40 lb N top

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<tr>
<th>Treatment</th>
<th>Fall</th>
<th>Spring</th>
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<td>1</td>
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<tr>
<td>2</td>
<td>4 oz P-1000</td>
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</tr>
<tr>
<td>3</td>
<td>8 oz P-1000</td>
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<tr>
<td>4</td>
<td>None</td>
<td>4 oz P-1000</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>8 oz P-1000</td>
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</table>

15 gal of H2O carrier needed = 260 mL/plot
4 oz of P-1000 = 0.5 mL/plot
8 oz of P-1000 = 1.0 mL/plot
P-1000 Yld

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<tr>
<th>Treatment</th>
<th>Yield (bu ac⁻¹)</th>
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<tr>
<td>check</td>
<td>46.7</td>
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<tr>
<td>fall 4 oz</td>
<td>46.4</td>
</tr>
<tr>
<td>fall 8 oz</td>
<td>45.6</td>
</tr>
<tr>
<td>spring 4 oz</td>
<td>45.4</td>
</tr>
<tr>
<td>spring 8 oz</td>
<td>44.5</td>
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LCB P-1000
P-1000 Protein