### Soybean Research Verification Update

The soybean research verification field located on the Larry Rasberry farm was planted on 5/4/15. The variety is Delta Grow 4990 LL. Zidua at a rate 2 oz/A was applied at planting. Emergence was on 5/13/15 and the stand counts averaged 124,000 plants/ac. As of 5/27/15 the field is a V3. 29 oz/A of Liberty + 1 pt/A of Dual were recommended to suppress weeds.

### Rice Research Verification Update

The rice research verification field with producer Febo Smart is in the second year of the program. Again like last year we went with the new conventional variety LaKast. LaKast is very similar to Roy J but is typically about a week earlier. The field was planted on 5/6/15 at a rate of 65 lbs/ac with CrusierMaxx. 32 oz/A of Touchdown was applied at planting. Pre-emergence herbicides: 1 pt. Command + 3.2 oz. League + 1 qt. Touchdown + 1 oz. Permit. The field emerged on 5/16/15. Stand counts will be taken soon.

### Grain Sorghum Verification Update

The grain sorghum verification field located in Pastoria with producer David Edwards was planted on 5/2/15 and the variety is Armor Maverick. On 5/6/15 1.3 pts/A of metolachlor was applied. The field emerged on 5/9/15 and stand counts were conducted on 5/9/15 and the field had an average of 89,500 plants/ac. As of 5/27/15 the field is at V4 and 1.5 qts of Atrazine and 240 lbs of Urea were recommended. The field has a slight sulfur deficiency and 50 lbs of Ammonium sulfate was recommended as well.
Rice Preflood Nitrogen Management Issues

by: Jarrod Hardke, Rice Extension Agronomist

For many rice fields, options are running out for pre-flood nitrogen (N) applications. It’s time to play the hand we’re being dealt with no time to wait for new cards. Last year we encountered similar problems, but no one was prepared to see a repeat of those prolonged wet and cool conditions. In some ways conditions may be worse this year than last. Regardless, it’s back to the same drawing board as last year as we’re experiencing tremendous difficulty applying pre-flood nitrogen to rice the way we want – on dry ground at the 4- to 5-leaf stage before establishing the permanent flood.

In order of preference, based on yield response and N efficiency, here are options for applying pre-flood N based on field situations:

1. **Field is dry:** Apply NBPT-treated urea onto dry soil and establish the permanent flood in a timely manner to incorporate N below the soil surface. If you have any time to spare, it is always best to apply pre-flood N onto dry soil – applications onto muddy soil or into standing water are far less favorable and much less efficient methods of N fertilization.

2. **Field is muddy:** Apply NBPT-treated urea onto muddy soil and attempt to let the soil dry if you have time. If a significant rainfall event occurs (~0.5 in or more) to re-wet the field then begin flooding; otherwise let the soil dry before establishing the flood. If you’re applying N to mud we do not know how much N will be lost, but if you feel the need to increase the N rate, do so only slightly (10-20 lbs N higher). This increase may or may not provide much benefit, but it’s less likely to hurt in this case. Watch the crop closely and apply extra N if N deficiency occurs.

3. **Field has standing water:** Get the water off the field if at all possible (if time allows). Many no longer have time to get the water off and let the soil dry. In this case, holding the water and “spoon-feeding” N into the flood in small quantities every 5-7 days for 3-4 weeks is the best option – lean toward every 5 days. A small quantity means 45 lbs N per acre (100 lbs urea per acre). If you have a short time to internode elongation, maybe applying N for 3 weeks at 45, 60, and 60 lbs N per acre will be better. However, smaller quantities applied more frequently are your best option in this situation. Do not, for any reason, apply the entire recommended preflood N rate in one application into standing water.

4. **Preferred “worst-case” management:** Apply N to muddy/wet soil as rice reaches the end of the N application window according to the DD50 program. Attempt to let the soil dry out underneath the applied N and if a significant rainfall occurs, start flooding. Realize that some N is lost in this case and be prepared to monitor the crop closely and apply additional N later if the rice looks like it needs it.

5. **Fields unable to hold a flood (levees and gates unfinished):** Apply a small amount of N and wait for the soil to dry or receive upcoming rainfall. If heavy rain is expected and movement is a concern, ammonium sulfate should be used for this application; otherwise, apply NBPT-treated urea. If conditions are still not dry enough to flood the field in a week, subsequent N applications will be needed in the same manner until a flood can be established. At the point the flood can be established, apply any remaining N requirements to the dry soil and flood.
When preflood N is applied onto dry soil to rice at the 4- to 5-leaf stage and a flood is applied timely, plants take up at least 60% of the total N applied over the course of 3 weeks (10% week 1, 20% week 2, 30% week 3). In general the period from the optimum time to apply preflood N until internode elongation (IE) is about 3 weeks, but from the final recommended application time to IE is about 2 weeks. However, these timings are based on plant development when rice has received timely N fertilization and flooding – delaying these causes rice to develop more slowly. Keep in mind that we can only make up a small amount of yield with N applied at midseason.

Previous research has shown that N applied onto dry soil has the most yield benefit. Applying urea onto muddy soil can result in a 20% yield loss. However, applying ammonium sulfate or urea + NBPT onto muddy soil and letting the soil dry can reduce the yield loss to only 10%. In this research, N was applied just prior to permanent flood at the 4- to 5-leaf stage. Past the 4- to 5-leaf stage, potential yield losses could become more dramatic. However, many factors influence how much flexibility we have in our N fertilization timing, including cultivar, length of maturity, native soil N, soil type, etc. If native soil N is high, then the effect is reduced. If it is a longer season cultivar then there is a greater window before midseason. In any case don’t let it get too late before applying N. Use of the DD50 Rice Management Program can help to time management decisions in these situations (http://DD50.uaex.edu).

Managing Ammonia Volatilization Losses from Urea in Less than Ideal Conditions

by: Trenton Roberts, Research Assistant Professor, Crop, Soil & Environmental Sciences

It’s that time of year again. Time to apply sidedress N to corn and grain sorghum and apply pre-flood N in rice. Unfortunately the weather has not been as cooperative this year as many of us would have liked, but there is still time to make the best out of a bad situation. If the current forecast/weather pattern holds, the soil in many fields will be moist to muddy and a decision will have to be made to apply sidedress/pre-flood N onto wet soil or wait for the rain to stop and soil surface to crust before urea is applied. Ammonia volatilization losses from surface-applied urea can be significant and result in as much as 30-40% of the total N being volatilized and unavailable to the crop (Fig. 1). Losses of urea as ammonia gas increase as wind speed, soil moisture, humidity (>70%), soil pH, and temperature increase. Under warm (spring and summer) conditions, urea needs to be incorporated with tillage, rainfall (>0.5 inch rainfall), or irrigation immediately and at least within two days following application to significantly reduce gaseous ammonia loss. Ammonia volatilization loss of urea is much more rapid and extensive when urea is applied at high rates or to a muddy low caution exchange capacity soil compared to a dry soil (Fig. 1). The ammonia loss potential tends to be lower in clayey soils because of their higher caution exchange capacity compared to silt or sandy loam soils (Fig. 2). Research in Arkansas shows that under warm/summer conditions, ammonia loss from surface-applied urea occurs most rapidly the first five days after application to a silt loam (Fig. 1) and the first ten days when applied to a clay soil (Fig. 2). The use of NBPT (N-(n-butyl) thiophosphoric triamide), a urease inhibitor, can help minimize urea loss via ammonia volatilization when applied to a muddy soil; however, every effort should be made to apply urea to a dry soil even when NBPT is used. A number of NBPT-containing products are now available for adding to urea and urea-ammonium-nitrate (UAN) fertilizers. These products may contain different amounts of the active ingredient NBPT. The concentration of each individual ingredient is typically given on the product label. However, some NBPT-containing products have elected to not show the specific concentration of important and assumes that the ability of NBPT to inhibit ammonia volatilization is not affected by the other ingredients that may be included in the actual product or other products (other inhibitors and drying agents) that may also be added to the fertilizer. Manufacturers of NBPT-containing products are encouraged to list the concentration (percentage by weight) of each individual ingredient...
including NBPT on the label. The most common recommended NBPT application rate ranges from 1.6 to 1.8 lb NBPT per ton of urea which is equivalent to the addition of 0.08 to 0.09% NBPT by weight. Note that the NBPT application rate for UAN fertilizer is different than that for granular urea.

Farmers have adopted the use of NBPT as a management tool for surface-applied urea, particularly in rice fields where establishing a flood in two days or less is difficult, or in upland crops where urea may remain on the soil surface for extended periods of time following application (e.g., not incorporated by tillage or irrigation). The high adoption rate of products containing NBPT has stimulated the marketing of numerous products with claims of similar benefits (i.e., reducing ammonia volatilization). Before the University Of Arkansas Division Of Agriculture recommends a product that claims to have inhibitory effects on the enzyme urease or simply “ammonia volatilization loss of urea” the products must be subjected to a laboratory test, which measures ammonia volatilization from urea amended with the commercial product of question compared to the volatilization losses of urea and NBPT-treated urea. At the time this article was written only the NBPT-containing products listed in Table 1 have been tested and shown to effectively inhibit ammonia volatilization from urea when applied at 0.08 to 0.09% NBPT.

Taking the time to manage sidedress/ pre-flood N correctly will pay dividends come harvest time. When choosing a urease inhibitor to protect your sidederess/pre-flood N investment a little due diligence in making sure you are applying a documented inhibitor and applying it at the correct rate will be money well spent in a year such as this. For more information of urease inhibitors please refer to University of Arkansas Division of Agriculture publication FSA 2169.

### Table 1. List of tested and recommended NBPT-containing urease inhibitors (based on product labels available in May 2015) and suggested application rates for urea and urea-ammonium-nitrate (UAN).

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Manufacturer</th>
<th>Weight per gallon (lb/gallon)</th>
<th>NBPT concentration %</th>
<th>Urea</th>
<th>UAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgrtainUltra</td>
<td>Koch Fertilizer</td>
<td>8.84</td>
<td>26.7</td>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Arborite AG</td>
<td>MiroSource Co</td>
<td>9.15</td>
<td>20.0</td>
<td>2.0-3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Arborite AG-NT</td>
<td>Weyehaser NR Co.</td>
<td>9.15</td>
<td>24.0</td>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Factor X2</td>
<td>Rosen’s Inc.</td>
<td>9.1</td>
<td>50.0</td>
<td>1.63</td>
<td>0.815</td>
</tr>
<tr>
<td>Factor</td>
<td>Rosen’s</td>
<td>9.0</td>
<td>24.5</td>
<td>3.25</td>
<td>1.625</td>
</tr>
<tr>
<td>Limus</td>
<td>BASF Corporation</td>
<td>9.06</td>
<td>16.9</td>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>N-Fixx</td>
<td>Helena Chemical</td>
<td>8.80</td>
<td>Unknown</td>
<td>3.0-4.0</td>
<td>1.5-2.0</td>
</tr>
<tr>
<td>Nitrain</td>
<td>Loveland Products</td>
<td>8.93</td>
<td>26.7</td>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>NitroGain#</td>
<td>Arclin, Inc.</td>
<td>8.92</td>
<td>20.0</td>
<td>4.0</td>
<td>1.5-2.8</td>
</tr>
<tr>
<td>NitroGain#</td>
<td>Arclin, Inc.</td>
<td>9.00</td>
<td>26.7</td>
<td>3.0</td>
<td>1.5-2.8</td>
</tr>
<tr>
<td>N-Veil</td>
<td>Invictis Crop Care, LLC</td>
<td>8.92</td>
<td>26.7</td>
<td>3.0-5.0</td>
<td>1.5-2.8</td>
</tr>
</tbody>
</table>

One ton of fertilizer approximates 181 gallons of 32% UAN and 187 gallons of 28% UAN.

Arborite AG-NT distributed by Gavilon Fertilizer

Must also contain 5.6% N-(n-propyl) thiophosphoric triamide [NPPT] for a total triaminde concentration of 22.5%.

Unknown, the product label does not specify the concentration of NBPT in the product.

#NitroGain will be sold containing a single trade name (NitroGain) with one of two concentrations. Anyone using this product should pay close attention to the NBPT concentration listed on the label to match the appropriate product use rate (3 or 4 qt/ ton urea) which may vary with NBPT concentration.

**Pesticide Applicator Training**
The Jefferson County Cooperative Extension Service will conduct a Pesticide Applicator Training (PAT) on Monday, June 22, 2015. Registration will begin at 6:00 pm and is $10 per person (check preferred and made to the Jefferson County Cooperative Extension Service). If you need to be certified or re-certified, this training is for you! If you have received a letter from the Arkansas State Plant Board notifying you that you need to be re-certified, you must do so before a new private applicator license can be issued to you. You must also have a private applicator license to purchase restricted use chemicals/pesticides. Call 870-534-1033 or email awhittington@uaex.edu for additional information or to register.

New License Plates from the Arkansas Rice Council

A special Arkansas license plate highlighting the state's rice industry is now available. The Arkansas Rice Council worked with the Department of Finance and Administration to develop the specialty license plate to promote rice, Arkansas's second highest value commodity and top agricultural export. Specialty fees from the plates will help fund scholarships and education programs for students pursuing careers in agriculture or the food industry.
**The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer."
Persons with disabilities who require alternative means for communication of program information (large print, audiotapes, etc.) should notify the county Extension office as soon as possible prior to the activity.