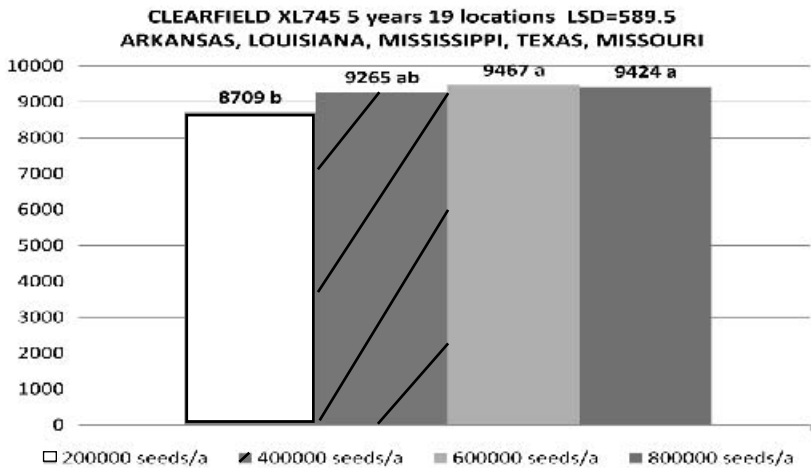




‘fissuring’, ‘rewetting’ or ‘checking’. ‘Rice fissuring’ has been documented through the years as rice that has dried below a certain moisture level in the field then rewetted by rain-fall dew or humidity forming micro-fissures within the kernel which reduce the kernel strength leading to breakage when the rice grain is milled using commercial friction methods. Questions have been raised for years around what affect if any the large amount of tillers hybrids produce has on milling. Results from side by side field tests indicate that the reduced seeding rates and corresponding increased tillering of RiceTec hybrids does not affect milling yields. Actions that minimize risk of rice checking are timely harvest, proper combine adjustment, well managed storage and drying after harvest. In conclusion individual location tests and in combined analysis grain yield and milling yields from seeding rates from 400,000 seeds per acre to 600,000 seeds per acre were not significantly different. Even at plant populations below 3 plants per square foot RiceTec hybrid rice seed offers significant economic advantage over commercial varieties.



Program 6R-2

► Nitrogen Management In Rice: Rates, Timings, Sources

Presented by Dr. Timothy W. Walker

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Introduction

Nitrogen (N) fertilization accounts for a large percentage of inputs for rice production. The potential for an economic return on the N investment is also large. Nitrogen is dynamic in nature, and thus it must be managed appropriately to provide the greatest economic return. The knowledge base of N interactions with the soil and plant system continues to increase,

especially with respect to midsouthern USA environments. Nitrogen application at the appropriate rates has been encouraged historically; however, in recent years, variety susceptibility to lodging has shown the necessity to fine-tune N rates to minimize lodging. Application source and timing are very closely related in the production system. Sources applied in environments that promote N loss via volatilization and/or nitrification/denitrification must be applied as close to the establishment of permanent flood as possible (< 3 days) to maximize efficiency. However, products that are stabilized from N loss provide the opportunity for growers that can't establish a flood in a few days to still maximize N efficiency even at applications of 8 to 10 days prior to permanent flood establishment. The objective of this presentation will be to disseminate several N management studies to aid growers in decision making regarding N application for rice.

Materials and Methods

Multiple N field and laboratory trials have been conducted in Mississippi, Louisiana, and Arkansas in recent years, each with the over-arching goal of improving N management strategies. Specifically, volatilization trials have been conducted in laboratory and field environments to evaluate products that claim to minimize volatilization losses. Furthermore, laboratory and field trials have been conducted to determine the nitrification/denitrification potential of several soils representative of where rice is produced in the midsouthern USA. Additionally, trials have been conducted to evaluate products that can potentially minimize nitrification and hence denitrification loss. Finally, traditional N rate trials have been conducted for the numerous new cultivars that have been released in recent years. This gives growers a N rate range to reach 95% relative yield potential and greater and also provides information regarding a cultivar's ability to resist lodging.

Results

Laboratory and field trials conducted in Mississippi, Louisiana and Arkansas have all proven that only one active ingredient is being marketed that effectively minimizes volatilization potential and hence can improve nitrogen use efficiency when volatilization conditions are present. Agrotain®, Arborite®, and N-FIXX® are trade names that all contain the active ingredient N-(n-butyl) thiophosphoric triamide, known as NBPT. Regardless of the trial, NBPT when applied at the appropriate rate has effectively minimized volatility. Nutrisphere®, Upgrade®, N-ZONE®, STAY-N®, and N-STAY® failed to minimize volatilization loss potential. Additionally, our studies indicate that coarse-textured soils such as the silt loams tested in Mississippi, Louisiana and Arkansas tend to lose more N to volatilization compared to fine-textured soils such as the clay soils in Mississippi. Grain yield loss on soils that exceed 20% loss of N to ammonia volatilization have also shown yield loss in excess of 15% when urea is applied and a flood is not established until 10 days after application.

Laboratory trials indicated that soils differ in nitrification potential. Various Mississippi soils were evaluated and resulted in half-lives of ammonium ranging from less than 5 days to approximately 9 days. Approximately 50% of the N that contributes to grain yield can be lost when urea is applied, a rainfall event occurs after application, and a permanent flood cannot be established within 7 to 10 days after application. Chemical nitrification inhibitors, including dicyandiamide (DCD), have shown some ability to decrease nitrification; however, it has not provided as much stability as a physical coated product (Agrium 43% N) has. In two years of research, Agrium 43% provided acceptable stability from the nitrification/denitrification process. Laboratory procedures are currently underway to further investigate the potential for this product.

Nitrogen response trials have provided information regarding N rates that are needed to optimize cultivar performance. CL151 has been prone to lodging since its release. Multi-location trials have shown that CL151 can achieve 95% of its yield potential with N rates that range from 90 to 135 lb N/acre, depending on the location. These rates also result in less lodging. This is in general a substantial reduction in N relative to cultivars that have preceded it (150 to 180 lb N/acre).

Summary

Nitrogen management is critical to the economic sustainability of the high input, mechanized rice cultural system used in the USA. Regional research efforts have provided up-to-

date management recommendations for improving N use efficiency. Product testing is important so growers can make informative decisions on what products to employ and how they are best utilized in their system. Knowledge of the soil/plant interactions is critical and continued investigations are critical to further develop best management practices for rice production.

Program 13R-2

► **Evaluation Of CLEARFIELD®
Production System Label Changes
On Clearfield® Hybrid Rice**

Presented by Mason Wallace
Development Representative, RiceTec, Inc.

BASF® recently changed its Clearfield® Production System to allow Beyond® to be applied at 4- leaf stage to panicle initiation on Clearfield® hybrids. The label changes allow producers the flexibility to apply Beyond instead of Newpath® at the second application timing. Experiments were conducted in Arkansas, Missouri, Texas, and Louisiana to evaluate the use of Beyond at this second application timing on Clearfield hybrid rice.

The experiments were planted in four states to insure a wide range of environmental conditions and varying soil types for the experiments. The Texas location was planted on April 4th at Eagle Lake, TX. The Louisiana location was planted on March 28th at Eunice, LA. The Arkansas location was planted on April 19th at Harrisburg, AR. The Missouri location was planted on May 31st at Broseley, MO. The experiments ranged from a clay soil at Eagle Lake, TX to a sandy loam at Broseley, MO. The experiments consisted of 1X and 2X rates in the Clearfield Production System utilizing Newpath applied at the 1-2 leaf stage and either Newpath or Beyond at the 4-5 leaf stage.

Treatment	Application Timing	
	1-2 Leaf Stage	4-5 Leaf Stage
1	0 oz/A	0 oz/A
2	Newpath 6 oz/A	Newpath 6 oz/A
3	Newpath 12 oz/A	Newpath 12 oz/A
4	Newpath 6 oz/A	Beyond 5 oz/A
5	Newpath 12 oz/A	Beyond 10 oz/A



All applications were made with a CO2 backpack sprayer at 10GPA. Crop oil concentrate was used at 1% v/v with each treatment.

The data from all four locations showed that regardless of application rate or product at the second timing there was no significant difference in yield among treatments. Newpath or Beyond resulted in very similar yields when applied at the 4-5 leaf stage at the varying rates. Yields varied by locations with Louisiana and Arkansas having the highest overall yields. The Missouri location had the lowest yields of all the locations due to its late planting date. The yield data showed that the two newest hybrids had the highest overall yield. The two new hybrids showed approximately an 8% increase in yield over CLXL745. The 1X and 2X application rates of Newpath and Beyond showed very little plant response at any of the locations. The Missouri location on the sandy loam soil did exhibit some plant response from the applications. Plants exhibited stunting and slow growth approximately two weeks after application for 7 to 10 days. Plant response was brief and plants quickly recovered from symptoms. No effect on yield was apparent in the Missouri data from the brief plant response. The data concludes that producers can choose between Newpath or Beyond at the second application timing in the Clearfield Production System with no differences in plant response or yield with RiceTec, Inc. hybrids. The label change will give producers more flexibility in