tillage, and sanitation.

A GR Italian ryegrass management program should begin with residual herbicides applied when weather permits between mid-October and mid-November. Depending on rainfall totals through the fall and winter months, residual herbicides [Dual Magnum (S-metolachlor), Treflan (trifluralin), and Command (clomazone)] applied in the fall prior to GR Italian ryegrass emergence may provide control that lasts until spring. Dual Magnum (1.33 pt/A) or Treflan (3 pt/A) should be utilized in fields that will be planted to cotton or soybeans the following year. Dual Magnum is the only fall residual herbicide for GR Italian ryegrass that may be safely applied if the field will be planted in corn. In fields where the following year's crop will be rice, Command (2 pt/A) is the only fall residual herbicide option. Treflan requires incorporation within 24 hours of application or GR Italian ryegrass control will be poor. Because Dual Magnum and Command are soil-applied herbicides, they still require incorporation, but this can be achieved with rainfall rather than mechanical incorporation.

None of the residual herbicides effective against GR Italian ryegrass have postemergence activity. Glyphosate-resistant Italian ryegrass that has emerged prior to application of residual herbicides must be controlled with aggressive tillage or an application of Gramoxone Inteon (2 to 3 pt/A). Gramoxone Inteon may be tank-mixed with Dual Magnum, Command, or Treflan. In a Treflan-based residual herbicide program, 4 to 6 hours should elapse between application and incorporation.

Few effective spring management options are available for GR Italian ryegrass, and spring herbicide programs often require sequential applications. Gramoxone Inteon (paraquat) and Select Max (clethodim) are the most effective postemergence herbicide options for GR Italian ryegrass. However, depending on the timing of application, postemergence treatments often do not provide complete control. Scouting for GR Italian ryegrass that escaped the fall residual herbicide application should begin in January. Sequential spring herbicide programs for controlling GR Italian ryegrass should include either glyphosate (0.77 lb ae/A) plus Select Max (12 to 16 oz/A) followed 4 to 6 weeks later by Gramoxone Inteon (4 pt/A) or sequential applications of Gramoxone Inteon (4 pt/A) spaced 7 to 10 days apart. Regardless of the program utilized, all ryegrass should be completely controlled prior to planting.

Glyphosate-resistant Italian ryegrass represents a serious threat to crop production systems in the Midsouth. The presence of this weed also jeopardizes traditional glyphosate-based burndown programs. Management of GR Italian ryegrass requires a multi-faceted approach. Herbicide options are limited and Italian ryegrass has a history of rapidly developing resistance to multiple herbicide chemistries. With that in mind, tillage should be an integral component of GR Italian ryegrass management strategies.

Program 9C-2

▸ Identifying And Correcting The Causes Of Yield Variability In Cotton And Corn Fields

Presented by Dr. Donald Boquet

Professor, LSU AgCenter

Cotton and corn yield vary substantially within fields depending on variation in soil types, topography, and inherent soil characteristics. With the increasing cost of inputs, farmers need information about managing variable fields, including information about field yield limitations. This better enables the use of appropriate strategies for inputs levels justified by the field potential. The concept of precision farming is one way producers account for field variability to increase productivity. Use of site-specific inputs, however, assumes the causes of yield variability are correctly identified. In a Cotton Inc. sponsored study, intensive sampling and characterization of field variability identified factors potentially affecting yield in three fields (one in the lower Red River Valley, one on the Macon Ridge and one in the Mississippi River Delta) to evaluate approaches that might reduce effects of field variability. The soil types ranged from Norwood/Moreland silty clays in the Red River Valley; Calloway/Gigger silt loams on the Macon Ridge and Bruin very fine sandy loam/Sharkey clay in the

Mississippi River Delta. Electrical conductivity was determined for each of the three fields with GPS-equipped Veris instrumentation. Using EC soil maps, field topography and NRCS soil type maps, 20 to 22 small areas with different soil traits were identified within each field and sited by GPS. These areas were thoroughly soil sampled to 0- to 6- and 6- to 12-inch depths for analysis of nutrient status. The fields were uniformly planted with cotton in 2009 and data collected weekly in each plot in the three fields for agronomic growth traits. Leaf samples were collected at early flowering and mid-boll fill from each plot for plant tissue analyses. At harvest, cotton lint yields were highly variable within fields ranging from 333 to 1153 lb/ac on the Calloway/Gigger field, 929 to 1397 lb/ac on the Norwood/Moreland field, and 540 to 1296 lb/ac on the Bruin/Sharkey field. Correlations analyses were done relating yield variability to specific field traits of soil texture, pH, organic matter, and soil and plant content for N, P, K, Ca, Mg, S, Mn, Zn, B, Cu, Fe, Mo, Na, Ni, Si, Co and Pb. Soil analyses were also done for nematodes. There were relationships between several of the plant nutrients and yield for each of the fields and also potential deficiencies (and toxicity) of several nutrients, which were affected by field and by location within fields. Reniform nematode infestations were high in two of the fields and a probable cause of some of the yield limitations and variability. Plant leaf analysis did relate to the apparent soil nutrient deficiencies but some of the low soil nutrient values did not result in verifiable plant deficiencies. However, P, S, and Zn were deficient, and Mn levels were excessively high, in plants at the Red River and Macon Ridge field locations. The experiments were repeated on the same fields in 2010 but planted with corn rather than cotton. The 2010 corn results will also be discussed.

Program 16C-2

▸ Evaluation Of Polymer Coated Urea For Use In Southern Row Crop Agriculture

Presented by Dr. Bobby R. Golden
Assistant Professor/Soil Fertility, LSU AgCenter

1Urea ammonium nitrate (UAN) is the predominate N source utilized in Louisiana cotton [Gossypium hirsutum L.] and corn [Zea Mays L.] production systems. Nitrogen loss via denitrification, volatilization, and/or leaching can be great (50% of total-N applied) due to environmental conditions at application or if N applications are mismanaged. Use of controlled-release fertilizers in row-crop agriculture can potentially improve fertilizer nutrient use efficiency and reduce the risk of fertilizer nutrient movement in the landscape. Environmentally Smart N (ESN, 440 g N kg-1, Agrium Inc.) is a polymer-coated urea fertilizer being used for the production of row crops in the Midwest. The research objective was to evaluate ESN-N as an alternative N source for Midsouth cotton and corn production.

1Cotton and corn experiments were established during 2010 at the Red River Research Station on a Caplis very fine sandy loam under dryland and irrigated environments. Soybean [Glycine max L.] and cotton was the previous crop grown for the corn and cotton experiments, respectively. For cotton trials, ESN was broadcast by hand at five total-N rates ranging from 0 to 120 lbs N acre-1 immediately prior to seeding Phytogen 375 WRF at 40,000 seed acre-1. Urea ammonium nitrate was coulter-knife injected at identical total N rates as ESN. At the four true-leaf stage of cotton growth, identical total-N rates of ESN or UAN were applied to plots that did not receive N fertilizer at planting. Seedcotton yield was determined by harvesting the middle two rows of each plot with a Case 1822 picker fitted with a load cell. Approximately 2 lbs of seedcotton was collected from each plot to determine lint percent and fiber quality. Each experiment (dryland or irrigated) was arranged as a randomized complete block with 2 (N source) x 2 (application time) x 4 (N rate) factorial treatment structure and compared to an unfertilized control (0 lbs N acre-1). Each treatment was replicated four times. For analysis, each N source and application time were combined to constitute an N fertilization strategy.

For corn trials, ESN was hand applied at four total-N rates ranging from 0 to 210 lbs N acre-1 immediately prior to seeding Terral TV25BR23 at 30,000 seed acre-1. Urea ammonium