

New Nitrogen Soil Test Good For Farmers And Environment

STUTT GART, ARK.

The first site-specific nitrogen soil test for rice, developed by the University of Arkansas Division of Agriculture, will be used in the fields of a limited number of cooperating farmers in 2011, said Trenton Roberts, assistant professor of crop, soil and environmental sciences, who helped develop the breakthrough technology.

Roberts told visitors to the annual Rice Field Day at the Rice Research and Extension Center near Stuttgart that Arkansas Rice Research and

to obtain soil samples at a depth of 18 inches, as required for rice in silt loam soils. An auger attached to a power drill is drilled into the soil and back up through a hole in a bucket. It deposits in the bucket the exact amount of soil needed for a standard Division of Agriculture soil test sample box.

- Only nine to 10 samples are needed from a field of any size.

- Agrotain, which inhibits the volatilization of nitrogen, should be used with urea or liquid nitrogen fertilizer to ensure that the amount of nitrogen applied is available to the crop plants.

- Only one pre-flood nitrogen application should be needed. Research is planned to develop a sensor-based method of determining if a mid-season application is needed in a field.

In other field day presentations, RREC Director Christopher Deren said experimental lines for 60 hybrids made from the first round of crosses in a new hybrid breeding program are in field plots this summer. It will be several



Trent Roberts demonstrates a kit designed to collect soil samples at a depth of 18 inches for the new site-specific nitrogen soil test for rice. The test will be used on a limited number of farms in 2011.

Promotion Board funding made it possible to develop the new test and protocols for its use by producers.

The test is good for farmers and good for the environment, Roberts said. It will help producers apply the correct amount of nitrogen fertilizer needed for maximum rice yields in a field with no excess to run off in surface water.

Excess nitrogen also feeds fungi that cause some plant diseases in rice. Field tests have shown that lower nitrogen rates have reduced the need for fungicide applications to manage plant disease, Roberts said.

Research is continuing to calibrate the test for rice on clay soils and for wheat, Roberts said. Silt loam and clay are broad soil texture classifications that account for most of the cropland in Arkansas.

Nitrogen fertilizer is one of the greatest expenses in rice and wheat production, and its price is affected by the volatility in oil markets.

Currently, farmers estimate nitrogen needs based on a blanket recommendation for each soil type and previous crops in a field. Research has shown that the standard recommendation is usually either too little or too much, according to Professor Richard Norman, leader of the project to develop the test.

Norman said the test predicts the amount of "mineralizable soil nitrogen," which is the form that feeds plants. Until now, there was no such test because nitrogen exists in many organic forms in a constant state of change in the soil, he said. The amount actually available to plants has been hard to pin down.

As Norman's graduate student, Roberts was instrumental in developing the test and protocols for implementation, Norman said.

Other details about implementing the test, as discussed by Roberts with Rice Field Day visitors, included the following.

- The research team designed an easy method

years before new commercial hybrids could be released from the program, which is being conducted in cooperation with other rice-producing states.

Division of Agriculture weed scientist Bob Scott and soybean specialist Jeremy Ross said herbicide-resistant weed populations continue to increase.

A major concern for rice farmers is that no new chemistry is being developed to replace herbicides that are being marginalized by resistant weed populations in rice, Scott said. He urged farmers to use all methods available to avoid development and spread of herbicide-resistant weed populations.

Ross said the new LibertyLink system of soybean varieties that are tolerant to Ignite herbicide is a good alternative to Roundup Ready soybeans in fields with weed populations that survive Roundup treatments. A good supply of seed of LibertyLink soybean varieties should be available for planting in 2011, Ross said.

Another alternative is planting non-transgenic soybean varieties and using a conventional weed control program in fields with Roundup-resistant weed populations, Ross said. A good supply of seed of the new non-transgenic, high-yielding UA 4910 soybean variety developed by the University of Arkansas Division of Agriculture should be available for planting in 2011, he said.

Rice breeders Karen Moldenhauer and James Gibbons said an advanced rice breeding line will be proposed as a new variety release in 2011. The semi-dwarf, long-grain rice line has very high yield potential and is resistant to rice blast and other plant diseases, Gibbons said.

The new Arkansas varieties currently available – Roy J. Templeton and Taggart – look good in production fields this summer, Moldenhauer said. They have high yield potential, high grain quality and good disease resistance, she said. Δ