



Jim Lytle

ROW CROP RESEARCH:

APPLYING NEW TECHNIQUES

By Bob Ratliff

Mississippi's four major row crops—cotton, soybeans, corn and rice—have a combined annual value of almost \$1 billion. Millions more are added to the state's economy each year through processing, transportation and other activities associated with these crops.

Research in support of row crops is a significant part of the work of MAFES scientists on the Starkville campus and throughout the state. Much of that work involves applying new technology to crop production in order to increase yields, lower input costs and preserve natural resources.

Evaluating new varieties, pest control research and developing improved management techniques also are important aspects of MAFES row crop work.

Input from producers helps determine the types of row crop projects MAFES researchers undertake. Producers also participate in the research by volunteering space on their farms for variety evaluations and other projects. Their input and support helps insure that the projects under way at branch stations and other locations fill the needs of the Mississippians who make their livings from row crop production.

RIGHT INFORMATION PUTS INSECT CONTROL WHERE IT'S NEEDED

MAFES researchers are using a combination of high-tech and low-tech methods in the development of site-specific insect management for cotton.

"This approach to insect management depends on detection of parts of a crop at high risk of infestation," said MAFES entomologist Aubrey Harris. "Earlier research has shown that some insect pests, such as tarnished plant bugs, attack high-vigor areas of a crop, while pests such as the beet armyworm prefer areas that are not rapidly growing."

In the current project at the Delta Research and Extension Center, Harris, along with research assistants Pat English and Don Sudbrink, plant physiologist



Patrick English, left, Gene Wills and Aubrey Harris

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Gene Wills and assistant farm manager Boise Stokes are using field maps generated from remote-sensing data collected by flyovers to identify which areas of a field are growing vigorously and which are not.

The low-tech side of the research is the use of traditional scouting methods to verify the data on the ground. Precision agriculture methods can then be used to target the specific areas of the field at risk for insect damage.

"The research has shown insect problems can be handled with site-specific sprays applied to 35 to 70 percent of total field area in most cases," Harris said. "With additional progress in development of the technology, these methods may provide substantial savings to producers."

DELTA SOY: VARIETY INFORMATION AT YOUR FINGERTIPS

Mississippi soybean producers and breeders searching for information on currently available varieties have a new tool at their disposal.

Deltasoy is an Internet-based soybean information system providing decision support to soybean breeders and growers, said MAFES agronomist and Deltasoy project leader Ling Zhang.

“The Mississippi Soybean Variety Trials Report is the primary data source for the Deltasoy database,” he added. “Yield information is the primary element in the database, but disease information also is built into the system.”

The Deltasoy project is supported by the Mississippi Soybean Promotion Board and is based at the Delta Research and Extension Center.

The website is at <http://www.deltasoy.msstate.edu>.

RIGHT NITROGEN RATE KEY TO BOOSTING CORN YIELDS

Just 20 years ago corn yields in Mississippi averaged only about 50 bushels an acre. Today the average is more than 100 bushels and still on the rise, thanks in part to MAFES research.

A project by agronomist Eric Larson on farms of cooperating producers is evaluating the response of corn under irrigation to supplemental nitrogen fertilizer.

“Irrigation helps producers limit drought stress, which is likely the most important factor reducing corn yield potential,” he said.

Nitrogen fertilizer treatments ranging from zero to 400 pounds per acre are being evaluated. The data generated by this research will be used to formulate a yield equation for determining supplemental nitrogen needs for high-yielding corn.

“MSU Extension Service personnel will use the formula as a basis for determining more precise recommendations of supplemental nitrogen fertilizer, which should improve both producer profitability and the environment,” Larson said.

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Deltasoy project leader Ling Zhang

LESS WATER USE EQUALS MORE MONEY FOR RICE PRODUCERS

More than 80 percent of the nation's rice is produced in the Mississippi Delta, in part because of the region's abundant water resources.

Rice grown in flooded paddies, the common practice in the Delta, requires about one million gallons of water per acre during the growing season. Reducing the amount of water required for rice production would have significant economic benefits for producers, as well as conserving water resources.

A current MAFES project is examining the potential for reducing the amount of water required for rice production by improving irrigation efficiency.

“One of the practices we're studying is side- or multiple-inlet irrigation,” said MAFES weed scientist Joe Massey. The current practice common in rice production is to add water into a paddy from just a few irrigation riser locations. With multiple-inlet irrigation, water is pumped through flexible polyethylene pipe with numerous floodgates along its length.

“This allows water to be distributed more quickly and evenly across a field, reducing pumping time, costs and water losses from field edges,” Massey said.

A second water-saving method under investigation is the use of intermittent irrigation, a practice first devised in Asia and currently being refined by University of Arkansas researchers.

“This involves halting irrigation once the desired flood depth is reached and allowing floodwaters to decline until the soil moisture reaches about 85 percent saturation, at which point irrigation is resumed and floodwaters returned to their initial depth,” Massey said. The potential water savings, he added, are up to 50 percent over conventionally grown rice.

In addition to Massey, the research team includes research associate Cade Smith and Extension agricultural engineer Jim Thomas. Their project is funded in part by the U.S. Department of Agriculture.

Marco Nicovich



Agronomist Eric Larson, center, with corn producers Sykes, left, and Mike Sturdivant, Jr.

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MAFES scientists Cade Smith, left, and Joe Massey discuss rice research with USDA/ARS microbiologist Mark Weaver.