



Jim Lytle

*By Linda Breazeale*

Researchers and students are gaining information at Mississippi State University from a fully functional cotton mini-gin, the nation's only complete operational gin on a college campus.

MAFES agricultural engineer Eugene Columbus said the 3-year-old gin has been useful in teaching students and in ginning cotton from MAFES research plots. The mini-gin has the ability to accommodate producers' and industry's needs by processing cotton samples too small for a commercial cotton gin.

MAFES researchers use the gin to process some of their larger research plots. Samples are taken to evaluate moisture content, yields, U.S. Department of Agriculture classing and fiber quality. The mini-gin, which can process one bale an hour, also helped evaluate a new cotton-picker this fall in a joint research effort by MSU's Extension Service and the North Mississippi Research and Extension Center. Cotton Incorporated is funding the study.



## *cotton gin serves educational, research purposes*

The gin laboratory, located in the Pace Seed Lab at MSU, is valued at \$2 million. The university was able to construct the equipment for less than one-eighth that cost.

"The gin cost MSU less than \$250,000 to build, thanks to equipment donations by the Lummus Corp. and Continental Eagle Corp. The Southern Cotton Ginners Association and Foundation and several individuals also contributed to the project," Columbus said. "Those donors recognized the need for this type of educational opportunity on a university campus."

Columbus said gins have changed very little operationally over the years, but he still has goals for expansion and improvement of the mini-gin.

"Plans to improve the facility include adding a suction unloading system to allow us to take cotton from trailers. We want to add Programmable Logic Controllers to monitor cotton flow, shaft speeds and process throughput," Columbus said.

Two noncommercial, small-scale gins exist in the United States, both in Mississippi: the MAFES-Agricultural and Biological Engineering mini-gin and one at the U.S. Department of Agriculture's Cotton Ginning Lab in Stoneville. A third gin is under construction at the University of Georgia.

"The cotton gin is designed to take MSU's education a step further by offering an experience not available anywhere else," Columbus said. "Graduates of MSU's gin management and technology program gain the technical and business knowledge necessary to operate in the cotton industry."

Once at MSU, students can pursue a bachelor's degree in agricultural engineering technology and business with an emphasis in gin management and technology.

"Graduates from the gin management and technology emphasis are uniquely qualified for fiber processing industries," Columbus said. "They have the necessary experience and educational background to effectively manage complex ginning systems. Half of our graduates are working in cotton gins and the others are in agriculture-related jobs."

### Research explores narrow-row cotton for the South

Narrow-row cotton has been on the minds of Mississippi and other producers in the South since the 1960s. The idea of close-row, high-population cotton requiring only a few bolls per plant for acceptable yields with limited inputs is attractive. The narrow-row hurdles, however, have been the lack of a suitable harvester and concerns within the ginning and textile industries about trash.

Both of those concerns are being addressed by a MAFES project that grew out of the 2003 Beltwide Cotton Conference.

"Previously, a spindle harvester for narrow-row cotton was not available, but John Deere introduced a 15-inch spindle picker at the 2003 Beltwide," said Herb Willcutt, a Mississippi State University Extension Service agricultural engineer and a project coprincipal investigator. "Research by the manufacturer in Australia has been encouraging and that country now has several thousand acres in narrow-row cotton. We wanted to incorporate the new equipment and evaluate narrow-row production under our conditions."

Until recently, he added, narrow-row cotton could only

be harvested with stripper harvesters because of the dense plant populations. Heavy dew and high humidity during the harvest season allow stripper harvesting only a few hours a day in the Midsouth and Southeast.

"The availability of harvest equipment that can operate under our conditions while sending less trash to the gin opens up new possibilities for narrow-row cotton in Mississippi and other southern states," Willcutt said.

Support from Cotton Incorporated and equipment donations from John Deere and Great Plains Manufacturing allowed narrow-row plots to be planted at the North Mississippi Research and Extension Center in Verona and in the fields of private cooperator Keith Morton in Tippah County. In addition to Willcutt, principal investigators include MAFES agricultural engineer Eugene Columbus and MAFES agronomist Normie Buehring. Other project participants include Extension agents Tim Needham and Jay Phelps.

In 2003, a donated Great Plains planter was used to plant several variations of 15- and 30-inch row plots at Verona and in Tippah County. A 15-inch spindle picker row unit provided by John Deere and mounted on a MAFES plot picker is being used for harvesting.

This year cotton planting was delayed by wet field conditions, so the first year of the study involves a late harvest.

"First year observations indicate the plants in the 15-inch rows started blooming a few days earlier than the wider 30- and 38-inch rows," Buehring said. "The skip-row treatments had more bolls per plant than the plants in the solid-row treatments. Our objective is to determine the influence the various row patterns have on harvester efficiency, gin turn-out, lint yield, fiber quality, gross returns, and net returns."

The MAFES mini-gin also is an important resource for the narrow-row project.

"Commercial gins are not equipped for running small amounts of cotton and it would be difficult and expensive to get the data we need for this project from a commercial gin," Columbus said. "By having the small-scale gin available at MSU, we can collect detailed moisture content data, fiber length measurements, grade information and other data more efficiently, economically and faster than if we had to depend on an outside source."

The narrow-row project will continue through the 2005 cotton season.



Eugene Columbus checks the lint produced by the mini-gin.



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