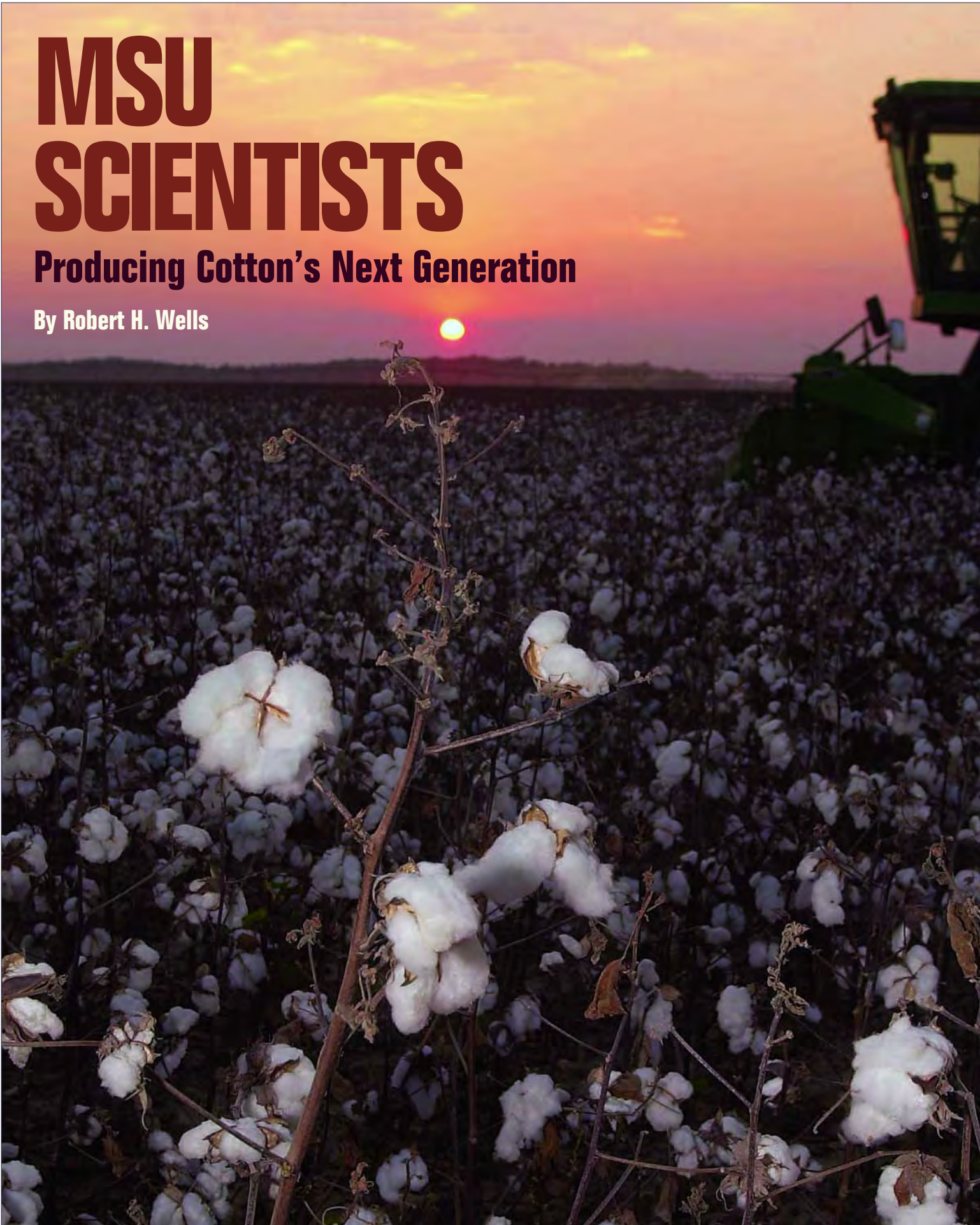


MSU SCIENTISTS

Producing Cotton's Next Generation

By Robert H. Wells

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Mississippi State University is using genetically modified plants in its cotton breeding program to create better cotton varieties for producers.

"Hopefully something great will come out of this to help the farmers," said Peggy Thaxton, a cotton breeder at MSU's Delta Research and Extension Center in Stoneville.

Thaxton is using the pollen from a Mississippi State transgenic cotton line developed jointly by MSU cotton breeder Ted Wallace at the Starkville campus and Monsanto, a producer of genetically modified seed, to make crosses into public cotton breeding lines.

Thaxton is primarily looking to increase the yield and fiber quality of MSU's genetically modified, or transgenic, cotton line.

"Fiber quality is very important to me and the program for the future of the farmers," Thaxton said. "Hopefully we'll get some very high quality transgenic cotton lines developed so we can be competitive in the global market."

Bill Meredith, a distinguished research geneticist and cotton breeder at the United States Department of Agriculture-Agriculture Research Service in Stoneville, agrees that current fiber qualities and yields need improvement.

"The world is changing and our primary customers are overseas," Meredith said. "They desire fibers that are different from those released in the 1990s. To get the most for our producers, you need to improve yield and fiber quality and also make good use of transgenes."

Other traits Thaxton will be looking to incorporate are reniform resistance, disease resistance and insect resistance.

"I hope to put traits into the transgenic cotton line that private companies don't," Thaxton said. "They are after yield because they have to sell their seed, but we're more flexible in that we can work with other traits as well."

Transgenic cotton, or cotton that has been genetically modified to contain traits artificial to the plant, is grown on more than 98 percent of the cotton acreage in Mississippi.

A recent agreement with Monsanto's Cotton States business unit has allowed MSU cotton breeders to incorporate Monsanto's transgenic traits into their breeding program.

"The chances for a producer to see a variety from Mississippi State are greatly improved if it is a transgenic," said Wallace. "Cotton States allows public material to make it to the market that otherwise wouldn't. It gives plant breeders access to technology we wouldn't otherwise have access to."

Wallace created MSU's first transgenic cotton breeding line through Cotton States by sending a high-performing cotton he developed to Monsanto for trait integration.

"One of my varieties, MISCOT 8806, performed within 95

percent of the best commercial check and justified trait integration," Wallace said. "In May of 2005, Monsanto sent me approximately 30 progeny rows of transgenic versions of the original MISCOT 8806 conventional variety to grow, observe and select the top entries for further testing.

"Performance of these entries during widespread yield trials across the Cotton Belt this summer will dictate whether or not Monsanto will attempt to market one or more of the new transgenic versions of the original MISCOT 8806 variety," Wallace added.

The MSU transgenic is characterized by having the Monsanto patented traits of Bollgard II, which offers increased insect resistance, and Roundup Ready Flex, which offers increased weed control.

"Peggy has access to the Mississippi State transgenic breeding line as well," Wallace said. "She is going ahead and making forward crosses with it so hopefully there will be offspring with Bollgard II and Roundup Ready Flex in them."

Thaxton made the first transgenic crosses this winter in a greenhouse in Stoneville.

"A lot of the material that I cross with is Ted's nectariless material," Thaxton said. "I'm crossing with the nectariless, the short fiber content line, the smooth leaf and the high fiber quality line. Those are the main ones I'm working with."

Thaxton said after the crosses open up, they will be planted in the greenhouse for a seed increase this summer.

"There's going to be a lot of seed increase this year," Thaxton said. "We're probably also going to send some of these to Mexico next winter for a seed increase.

"We have to make sure the transgenic traits are in the plant, and that takes a lot of seed," said Thaxton. "Hopefully in about four years, we'll have enough seed with the transgenes in there that we can start planting yield trials."

In addition to the transgenic breeding in the greenhouse, Thaxton also will have 30 acres of conventional cotton planted this summer in the field.

"The main objective of our breeding program is still to develop improved conventional breeding lines that will be released to private companies with better yields and fiber quality traits," Thaxton said. "We like to work with all the useful genes, including transgenes, in a forward breeding program, but the transgenics breeding is just a side project right now."

Support for producers, she added, is the ultimate goal of the breeding program.

"We're such a large cotton producing area here," Thaxton said. "We have a potential to improve the cotton variety and a chance to give back to the growers. This is something we need to do."



Peggy Thaxton uses pollen from MSU transgenic cotton to cross with public varieties. (Photo by Robert H. Wells)