

# Cotton and Peanut Breeding

University of Georgia crop geneticists receive grants to aid in production

The USDA's National Institute of Food and Agriculture (NIFA) awarded University of Georgia (UGA), Athens, College of Agricultural and Environmental Sciences (CAES) plant breeders almost \$1 million in grants this fiscal year to produce improved cotton and peanut varieties.

These plant breeders have been tapped to make Georgia's most profitable row crops more sustainable and productive.

## Searching for softer cotton

Regents' Professor Andrew Paterson ([paterson@uga.edu](mailto:paterson@uga.edu)), director of the Plant Genome Mapping Laboratory and member of the CAES Department of Crop and Soil Sciences and the Franklin College departments of Plant Biology and Genetics, and Peng Chee, a crop and soil sciences professor, are pinpointing cotton genes that affect the length of cotton fibers.

Longer fibers lead to softer cotton fabrics and a higher per-pound price for farmers, Paterson says.

Paterson and Chee will focus on Upland cotton – the cotton species most widely grown in the United States. Georgia farmers grew more than 1 million acres and \$967 million worth of Upland cotton in 2016.

Upland cotton typically produces cotton with short or medium fibers, and Paterson says those fibers can be even shorter if the cotton plant is stressed. However, he says mutations of Upland cotton created by the researchers produce longer fibers.

Supported by a \$490,000 NIFA grant, Paterson and Chee will map genes connected to superior fiber qualities in this mutated Upland cotton. Eventually, Paterson says they will incorporate those genes into cotton varieties known for their



*Upland cotton typically produces cotton with short or medium fibers. University of Georgia professors Andrew Paterson and Peng Chee are working to develop Upland cotton varieties with longer fibers.*

hardiness, productivity, and efficiency.

“The long-term goal of the proposed project is to enrich genetic diversity and accelerate the breeding progress in the elite gene pool of one of the most economically important and genetically vulnerable major U.S. crops: cotton,” Paterson says.

## Looking to the peanut's roots

The average American eats about six pounds of peanuts a year. To meet that demand, farmers in Georgia grow more than 700,000 acres of the state's signature legume.

For each of those acres, UGA Senior Research Scientist Soraya Leal-Bertioli ([sorayab@uga.edu](mailto:sorayab@uga.edu)) says farmers invest between \$500 and \$770 into seeds, pesticides, irrigation, and herbicides. Tapping into the resilience of the peanut's wild ancestors, Bertioli says, should substantially bring down that per-acre price.

Bertioli, who worked with the international team of scientists that traced the evolution of the modern peanut to its wild ancestors in the Andes Mountains in 2016, received a \$445,000 grant from NIFA to find the genetic traits that protected ancient peanuts from fungal and insect problems as well as other diseases.

“In the '60s, '70s and '80s, hundreds of wild peanut populations were collected from the wild and deposited in the USDA seed bank,” she says. “Several studies show that these species carry resistance to pests and diseases that affect the peanut crop.”

Most of these species have never been bred with modern varieties. By using modern techniques, Bertioli hopes to introduce these ancient, naturally-occurring resistance traits into modern lines of productive peanuts. ■



*Soraya Leal-Bertioli, UGA senior research scientist in the CAES Department of Crop and Soil Sciences, received a \$445,000 grant from the USDA National Institute for Food and Agriculture to identify disease resistance traits in wild relatives of the cultivated peanut. (UGA photos)*