

Smooth, soft, durable fabrics made from pima cotton feel good and look great. Pima is prized for weaving into high-quality, long-lasting fabric for fine clothing or for luxurious sheets, towels, and other cotton goods.

The secret to pima quality and durability? Extra-long fibers that give a satiny look and touch. Produced on some 200,000 acres in California and the Southwest, cotton from

the pima plant, *Gossypium barbadense*, commands premium prices.

For more than 40 years, ARS researchers—in conjunction with University of Arizona scientists—have been developing superb new pima plants. In all, they have offered more than 200 different pima genetic lines or varieties to cotton breeders in the United States and abroad. Some plants boast higher yields and provide superior fiber quality or greater resistance to insect pests.

Today, virtually every type of pima cotton grown commercially in America has at least some ARS lineage, according to Richard G. Percy of the ARS Western Cotton Research Laboratory in Maricopa, Arizona. Breeders of conventional or upland cotton, *G. hirsutum*, may also benefit from the pima research. That's because—with some extra work—pima and upland cottons can be crossbred.

The Arizona lab's newest pima genetic lines are better able to fend off attack by pink bollworm and silverleaf whitefly—two major pests of cotton in the American West. The new lines also mature earlier than some other pima types, reducing the need for water, pesticides, and fertilizers.

Thanks to other ARS work, tomorrow's pimas may endure blistering heat better than today's varieties. In 1991, ARS and University of California at Los

Angeles scientists identified a previously unnoticed quirk that helps some pima plants keep their cool.

To conserve precious moisture, most desert plants close leaf pores—or stomates—as the day gets hotter. But the scientists found that certain pima plants, if properly irrigated, tend to leave their stomates open longer, releasing moisture that then cools the leaves.

Yields of these cooler plants were higher than those from many other

pima types, according to tests by John W. Radin of ARS. Now at Beltsville, Maryland, Radin did the Arizona experiments with Percy, along with Eduardo Zeiger of UCLA and Zhenmin Lu, formerly at that campus.

A research team at New Mexico State University has built on that work. Roy G. Cantrell leads the group, which included Mauricio Ulloa—now with ARS at Stoneville, Mississippi. Cantrell's team pinpointed genetic markers that may in turn lead to genes that control the cooling-off trait.

Once that happens, those genes could be shuttled into plants which lack the trait. That would give the plants a new, natural means of producing high yields in spite of blazing-hot summer days.—
By **Marcia Wood**, ARS.

This research is part of Plant, Microbial, and Insect Genetic Resources, Genomics, and Genetic Improvement, an ARS National Program (#301) described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/cppvs.htm>.

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Superb New Pima Cottons