

New Uses for Kenaf

Fifty-five percent of dried kenaf stalks will be used to make paper. Waste products from the process can be made into fertilizer and feed binder.

Cotton's cousin, kenaf, may be more attractive than it used to be to farmers because ARS researchers recently found new uses for black liquor, a by-product of making paper from kenaf.

"Black liquor is usually burned for fuel or chemical recovery, but small paper mills can't afford expensive incinerators for its disposal," says ARS chemist Thomas P. Abbott. He leads research to develop products and markets for alternative crops.

U.S. farmers could plant kenaf in place of corn, soybeans, cotton, or rice. But making such a change hinges on getting an economic return on their investment. To help, employees of ARS and of Vision Paper, Inc., of Albuquerque, New Mexico, rolled up their sleeves and got their hands dirty. In the end, they turned a waste product into something of value.

Abbott found that chitosan—made from ground-up crab shells—helps transform dissolved kenaf lignin into a solid cake. Future tests will examine using the solid cake as an animal feed binder. The remaining soluble black liquor can be converted to a low-sodium, dry fertilizer containing about 22 percent nitrogen.

"Our process makes nearly one-third of the black liquor solids available for use as a binder for animal feed and two-thirds for use as a fertilizer," says Abbott.

A technician for Vision Paper, Inc., JoDean Sarins has worked on the project side by side with ARS researchers at the National Center for Agricultural Utilization Research (NCAUR) in Peoria, Illinois, since April 1999.

"We're pleased with the remarkable results we've seen in such a short time. Our work—to develop products and markets for raw materials of alternative crops—typically takes a lot longer," says Abbott.

"Developing new crops and new uses takes a commitment to projects that are

long term. No one can reasonably expect that a single new use will change the status quo of manufacturing processes in just a few years. But changes can be integrated one step at a time," says Thomas Rymysza, president of Vision Paper. This work was done through a cooperative research and development agreement between Vision Paper and ARS.

U.S. consumers are likely to find kenaf fiber in carpet backing and padding, a fiber mat in automobiles, roofing felt, fire logs, and cardboard. Copy machine paper made with kenaf and 30 percent post-consumer waste is also commercially available in the United States. In Japan, commercial products made from kenaf include hamburger wrappers, fast-food containers, and wallpaper.

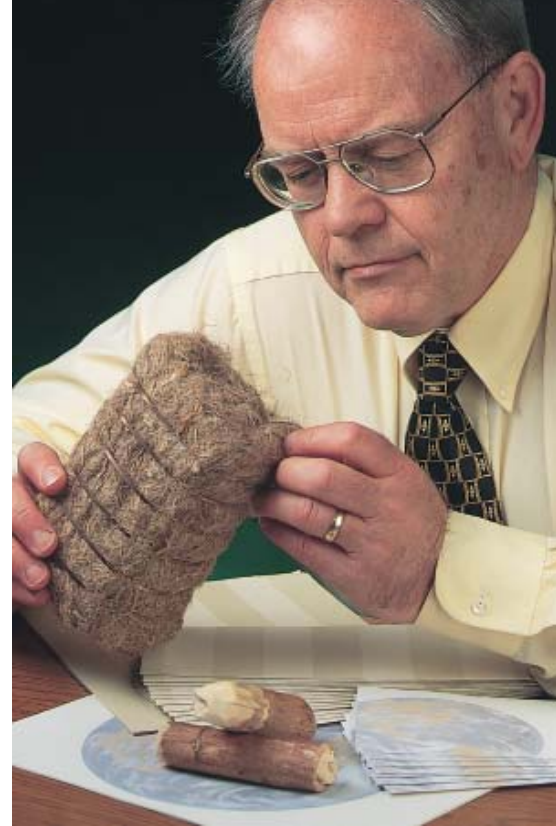
Another U.S. company is putting kenaf into composite board in place of fiberglass. Kenaf's strength and low weight make it less likely to shatter or warp under extreme temperatures.

The crop is being grown on about 12,000 acres in Texas, Mississippi, Georgia, and elsewhere, says Abbott.

A patented process for turning kenaf fiber into newsprint—developed by ARS scientists in Peoria—was among *R&D Magazine's* top research technologies for 1988.—By **Linda McGraw**, ARS.

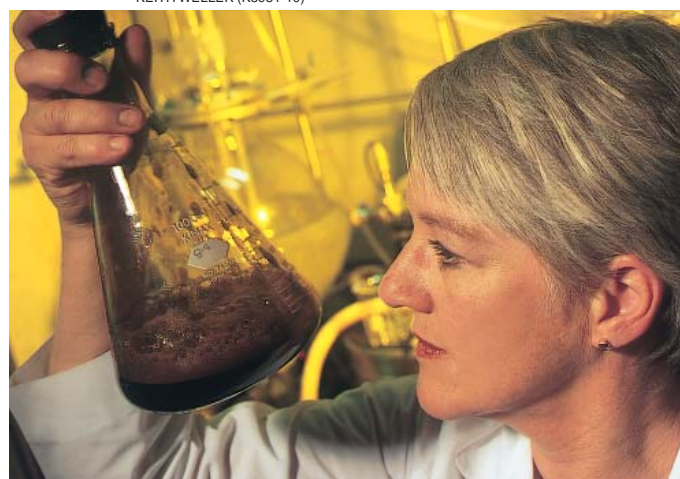
The research to develop co-products for alternative crops is part of New Uses, Quality, and Marketability of Plant and Animal Products, an ARS National Program (#306) described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/cppvs.htm>.

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KEITH WELLER (K8981-1)

Chemist Thomas Abbott examines a bale of mechanically separated kenaf fiber before it is processed into commercial paper products.



KEITH WELLER (K8981-10)

In the New Crops Research Unit at Peoria, Illinois, technician JoDean Sarins of Vision Paper, Inc., examines black liquor waste from kenaf pulping.