
AAES Impact

RESEARCH NEWS FROM THE ALABAMA AGRICULTURAL EXPERIMENT STATION

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PROVIDING SEED MONEY FOR RESEARCH

The three research projects profiled below are among 11 proposals that have been funded under the 2006 AAES Grant Program for Agriculture and Related Research.

Funding for the approved projects totals more than \$313,000 for one year. Most of the proposals, however, are for three-year projects, which would bring the total potential commitment to more than \$900,000.

The AAES grants program, which began three years ago, basically provides seed money that

allows researchers to conduct pilot studies and generate preliminary data they can use to go after additional funding from sources outside of AU.

The likelihood of a proposal attracting extramural funding, in fact, is a key criterion the review committee considers in awarding the competitive grants.

The grants program is open to AU faculty in the School of Forestry and Wildlife Sciences and the colleges of Agriculture, Human Sciences, Sciences and Mathematics and Veterinary Medicine. ♦

Honing in on hardier cotton

The search for cotton plants that can ward off root-eating nematodes and tolerate extreme heat and drought has entered a new phase at AU.

After several growing seasons of evaluating almost 2,000 different varieties of cotton plants from around the globe, AAES plant breeder David Weaver has identified seven varieties found in Mexico, Brazil and Guadeloupe that show at least some natural resistance to costly reniform nematodes, and even more varieties that are significantly more tolerant of heat and drought than the cotton varieties adapted to grow in the U.S.

Because these exotic varieties aren't adapted to grow here, Weaver is looking for the genes responsible for nematode resistance

and heat tolerance. Once he's pinpointed those genes, the next step will be to transfer them into adapted cotton varieties.

Like all basic-research projects, this one won't come to fruition overnight.



Nematodes, heat stress cotton.

Weaver predicts it will be at least 10 years before these new-and-improved cotton varieties are growing in U.S. farmers' fields. The economic impact of the new varieties should be dramatic. Reniform nematodes cause millions of dollars in damages each year, and excessively hot, dry years cut yields by an average of 40 percent. ♦

Turning yard waste into power: a brilliant idea

Most folks look at grass clippings, leaves, tree limbs and shrubbery trimmings as nothing more than yard waste. Ed Loewenstein sees it as a wasted resource, and he and a team of other AAES researchers have launched a study to determine whether it would be feasible, economically and otherwise, for cities to build their own power plants and generate electricity

using that material as fuel.

With the city of Auburn as its subject in the three-year study, the scientists will quantify the type and amount of yard waste residents produce by season of the year. Then, using that data along with economic data they compile and landscape data they collect with remote-sensing technology, they will develop a model that any city could use to



Nicotine is the chief compound in tobacco.

Another strike against nicotine

A study that will shed light on nicotine's role in the development of such conditions as heart disease and diabetes is under way at Auburn University.

Specifically, AAES scientist Robert Judd, associate professor of pharmacology in Vet Medicine and head of AU's diabetes research program, is investigating how nicotine in the bloodstream affects the body's level of the hormone adiponectin.

Adiponectin, which is produced and secreted by fat cells, regulates the body's response to insulin. It also has anti-inflammatory properties that are associated with a reduced risk of heart disease.

Judd says researchers already know that nicotine inhibits the secretion of adiponectin. His project will determine the mechanisms that make that happen. That could lead to better methods of preventing and alternative methods of treating diabetes and heart disease. ♦

More diabetes research, Page 2

IMPACT is a bimonthly newsletter the Alabama Agricultural Experiment Station (AAES) publishes to inform state and federal legislators, public policy makers and the general public about AAES research projects and how they affect all Alabamians. The AAES (www.ag.auburn.edu/aaes/) is based at Auburn University (www.auburn.edu). Contact **IMPACT** at 334-844-2783 or jcreamer@auburn.edu.



HISTORIC RESEARCH SITE—A federal marker designating a four-acre AAES research field on the AU campus as a site on the National Register of Historic Places was unveiled in ceremonies recently. Established in 1911 on land owned and farmed by J.A. Cullars and John P. Alvis, the Cullars Rotation is the oldest continuous soil fertility study in the South, one of the nation's oldest continuous field crop experiments and the second oldest cotton production experiment in the world. The four-acre Cullars Rotation, located immediately behind the Jule Collins Smith Museum of Fine Art, provides important information on the long-term effects of fertilization on sustainable crop production in sandy, Coastal Plain soils.

Sharing data with the Vatican

An AU agricultural economist who has studied in depth the economic impact genetically modified crops have on farmers and consumers shared his research findings and his overall expertise on the use of biotechnology in agriculture with Vatican and Catholic Church officials in Rome earlier this fall.

Greg Traxler, one of three U.S. economists invited to the Vatican, primarily addressed officials' concerns that, with insect- and herbicide-resistant crops, large multinational corporations that developed the technology and control the seeds would reap massive profits at the expense and to the detriment of farmers.

Since GM crops hit the market in 1996, studies by Traxler and others have found that the biotech crops have yielded large economic benefits to farmers by lowering production costs and providing higher yields.

Although Vatican officials have offered no definitive judgments on the use of biotechnology, they have deemed it a "moral imperative" to investigate biotechnology's potential to meet global food needs and help alleviate hunger in the developing world. ♦

A key to the diabetes, obesity riddle

Research by AU nutrition scientist Suresh Mathews has solved a medical riddle that could lead to better health and longer lives for millions of people suffering from or at risk of developing diabetes, obesity or both.

The AAES researcher has found that fetuin, a blood protein secreted by the liver, may play a significant role in the regulation of glucose disposal, insulin sensitivity, weight gain and fat accumulation in the body.

Insulin is a hormone that the body needs to convert sugar and starches into energy for daily life. With diabetes, the body either does

not produce or doesn't properly use insulin.

In research with mice, Mathews has found that, once fetuin enters the bloodstream, it blocks the effects of insulin. Increased fetuin levels are associated with insulin resistance, the hallmark of obesity and type 2 diabetes.

The goal of Mathews' research now is to determine the mechanisms involved in turning off fetuin and how blocking the protein works to improve the body's insulin sensitivity, increase glucose utilization and prevent weight gain.

That could lead to development of a treatment for diabetes and obesity. ♦

Cattle—when smaller might be better

When it comes to beef cattle, is bigger necessarily better?

In a research project under way at the Tennessee Valley Research and Extension Center in Belle Mina, AAES animal scientist Daryl Kuhlers is looking to answer that question.

Specifically, he is investigating whether smaller-framed cows—animals that mature at about 1,100 pounds as opposed to the 1,200-1,400 pounds typical of cows

today—use feed more efficiently and, subsequently, can be more profitable than their larger counterparts.

He currently is breeding a line of smaller cattle for the study, in which he and fellow researchers will also evaluate and compare the quality of the meat from the two groups.

One goal is to develop a cow that could be raised to market size without needing supplemental feed. ♦



The impact of cow size on efficiency and profitability is the focus of AU professor's study.

Information contained herein is available to all persons without regard to race, religion, gender or national origin.