AAES **Impact**

RESEARCH NEWS FROM THE ALABAMA AGRICULTURAL EXPERIMENT STATION

October 2006 *vol. 4, no. 5*

Search on at AU for alternatives to petroleum-based fuels

The AAES is helping fund a new Auburn University initiative that will support alternative-energy research projects in several schools and colleges across campus.

The AU Board of Trustees in September approved $3 million in funding for the Auburn Alternative Fuels Initiative, a new effort aimed at reinvigorating Alabama's existing natural resource–based industries and establishing new industries based on energy and value-added products made from renewable biomass.

The alternative fuels initiative was launched Oct. 1. Of the $3 million in funding, two-thirds will come from AU's general fund, with the remainder coming from the AAES and the Alabama Cooperative Extension System.

In a related note, AU will host a statewide conference Oct. 23 and 24 that will focus on the possibilities of developing alternative energy solutions from Alabama's natural resources. Lawmakers are urged to attend and be a part of the discussion.

For more on the conference, go to www.eng.auburn.edu/alternative-energy. ◆

Battling minnows make distinct sounds of aggression.

The not-so-silent world 'down under'

You've heard of whale songs, but how about sturgeon squeaks, or minnow moans, or catfish croaks?

In a special acoustics lab at Auburn University, AAES fish behavioral ecologist Carol Johnston is discovering a fascinating world of sound that exists in freshwater rivers, streams and ponds of North America, as she studies the audible communications of numerous species of fish.

Scientists will use this new information to understand the evolution of acoustic signals in such species as bass, catfish, minnows, sturgeon and darters.

Currently, Johnston and her research associates are working to document what role acoustic signals play in mate selection and breeding—do females prefer males with deeper voices, for instance?—and the potential of using these signals to monitor species populations. ◆

NEW AG-RELATED INSTITUTE AT AUBURN

Agricultural and natural resource–related units at Auburn University, including the AAES, will merge into a new institute that will be led by a vice president.

The entity currently is being called the Institute for Natural Resources—the official name will be determined after a year's study—and at publication time, an announcement naming the vice president was pending.

Reporting to the new VP will be the directors of the AAES, the Cooperative Extension System and the AU Environmental Institute; deans of the College of Ag and the School of Forestry and Wildlife Sciences; and administrators of the new Auburn Alternative Fuels Initiative.

AU President Ed Richardson recommended creation of the institute to the Board of Trustees after nearly two years of study and consulting with internal and external constituents, including deans, administrators, faculty, the AU provost, leaders of state associations and others. The board approved the proposal at its June meeting. ◆

At issue: long-term reproductive health

An AAES animal scientist at Auburn has joined forces with researchers from two German universities in a study that could have implications for the reproductive health of animals and humans.

Study will focus on environmental estrogen's effects on newborn pigs.

In the three-year study, AU's Frank Bartol and two scientists in Germany, using newborn pigs, will focus on a naturally occuring compound called zearalenone. It is produced by molds that grow on grains. When an animal eats contaminated grains, zearalenone enters the body, where, mimicking the hormone estrogen, it can disrupt reproductive processes.

This environmental estrogen can be transmitted from a mother to her offspring in milk. Bartol's study will investigate the effects on reproductive-tract development and long-term reproductive health when newborn pigs are exposed to zearalenone for even a short time.

Exposure to environmental estrogens can also cause reproductive problems in humans. Consequently, results from Bartol's study could have implications for human health.

The pig is an ideal animal model for studies of the effects of environmental estrogens and related conditions with the potential to affect humans due to remarkable similarities between humans and pigs on biological, metabolic and genetic levels. ◆

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.

Insecticide-resistant mosquitoes can transmit a wide range of diseases.

Working to break mosquitoes' resistance

The global incidence of mosquito-borne diseases is projected to double to close to a billion cases annually in the next 20 years.

The main reason? Mosquitoes have developed resistance to insecticides , the most important components in the mosquito control effort worldwide.

But a pioneering study at Auburn University aims to uncover new genetic information that could lead to the development of novel strategies to bring mosquitoes under control and thereby reduce the prevalence of the diseases they transmit, including malaria, dengue fever and West Nile virus.

AAES researcher Nannan Liu, an insect molecular toxicologist at AU, is spearheading the study, in which researchers will pinpoint the genes that are involved in resistance and identify the mechanisms through which that resistance has evolved. Those genes could then become targets for developing new, mosquito-specific insecticides that kill the bothersome pests and that are less toxic than current chemicals to humans, animals and the environment. ◆

Lotus: a new crop for the Black Belt?

Could Alabama's Black Belt become the nation's new center of lotus production?

AAES researchers at Auburn think so, and they've helped put together an international collaboration to make that happen.

Lotus is an aquacultural crop that is easy and economical to grow. It has been grown as a food crop and ornamental and medicinal plant for 5,000-plus years in China, Japan and India and, in recent history, in New Zealand, Australia and other countries.

For the past six years, AU horticulturists have been visiting these countries to learn more about lotus and to collect edible and ornamental cultivars to test in the Black Belt.

In the first phase of the lotus project, researchers from AU and Alabama A&M, along with scientists from Mississippi State, the University of Georgia, China and Japan, will work to determine the market appeal of and demand for lotus products, evaluate lotus' economic potential and production costs, assess lotus' nutritional value and expand the current extensive collection of lotus ornamental and vegetable cultivars. Ultimately, the goal is to establish Alabama as the official U.S. germplasm repository for lotus cultivars.

Lotus, an aquacultural crop, could be the perfect selection for the Black Belt's poorly drained soils.

This project is being funded by an AAES Black Belt Aquaculture Initiative seed grant. AU professor Ken Tilt is providing leadership on the international, multi-disciplinary research team. ◆

A QUESTION OF TIMING—A crew installs subsurface drip irrigation tape in a cotton field at the Tennessee Valley Research and Extension Center in Belle Mina as part of a study to determine the optimum times to fertigate cotton in order to boost yields. Fertigation, or the application of fertilizers through an existing irrigation system, delivers fertilizers accurately and efficiently and can cut growers' production costs and save them time. In this study, a team of AAES biosystems engineers and agronomists led by AU bioystems engineer Mark Dougherty is testing four different nitrogen and potassium application schedules through several growing seasons to determine which results in the highest cotton yields and best crop quality. The Alabama Cotton Commission is helping fund the study.

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