AAES **Impact**

RESEARCH NEWS FROM THE ALABAMA AGRICULTURAL EXPERIMENT STATION

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# Helping growers net more profit

Over in the Black Belt in recent years, about a dozen Alabama farmers have been raising saltwater shrimp in ponds filled with low-salinity groundwater.

To help reduce production costs and help the farmers improve their production, AAES aquatic animal nutritionist Allen Davis and others at Auburn have been conducting a number of research studies.

These studies have concentrated on removing expensive fish meal from shrimp feed and replacing it with high-quality plant proteins, namely U.S.-grown soybean and corn gluten meal.

Results to date have been excellent, showing that plant proteins can effectively replace fish meal in commercial shrimp feeds without compromising production performance at all. Besides helping shrimp farmers, such findings should benefit U.S. grain producers by boosting demand for their products.

The research Davis and others have done over the past five years to help producers improve feed management and nutrition has yielded dramatic results in shrimp ponds.

**NOW AT WHOLE FOODS—Auburn University shrimp nutrition research, conducted primarily in small coastal ponds and in tanks in greenhouses in Gulf Shores, yields about 22,000 pounds of shrimp annually. These shrimp are now sold at Whole Foods Market in Mountain Brook. Whole Foods is the world's largest organic grocer. Revenue from the shrimp sales is plunged back into research.**

Alabama producers have gone from annual average harvests of 4,000 pounds per acre of 17-gram shrimp to 7,000 pounds per acre of 20-gram shrimp. ◆

## PLAYING UP THE 'GOOD' BACTERIA

There are "bad" bacteria and there are "good" bacteria, and it's that latter category that AAES plant pathologist Joe Kloepper has spent the past three decades studying, particularly as it relates to crop health.

In his work at Auburn, Kloepper has led the way in identifying, and naming, a group of naturally occurring soil microorganisms that are highly beneficial to plants.

They're known as plant growth-promoting rhizobacteria, or PGPR, a now-widely used acronym that Kloepper coined nearly 30 years ago to describe the root-colonizing bacteria.

The research has shown that not only do PGPR enhance plant growth and hardiness, as the name implies, but they also protect agricultural and horticultural crops against many diseases.

More than 200 scientists worldwide are studying PGPR to understand how they work and how they can be used practically.

In the U.S., some commercial products containing PGPR—they may be labeled as containing "biocontrol agents"—are already available to farmers and homeowners, but Kloepper says with increased concern over the environment and pesticide use, more should reach the market in the next five years. ◆

# *The freshman 15: fact or fiction?*

It's known as the "freshman 15"—the 15 pounds college students supposedly pack on in their first year at school.

But is the phenomenon for real? And if it is, what causes it?

Those are questions at the heart of an AAES study by Auburn University nutrition scientists Sareen Gropper and Claire Zizza.

They're monitoring the weight and body-fat composition of 25 female and 10 male freshmen at Auburn and asking the subjects to track what and how often they eat, who they eat with, where they eat, how often they consume alcohol, how much they exercise and how much sleep they get.

**The scale: an object of freshman dread?**

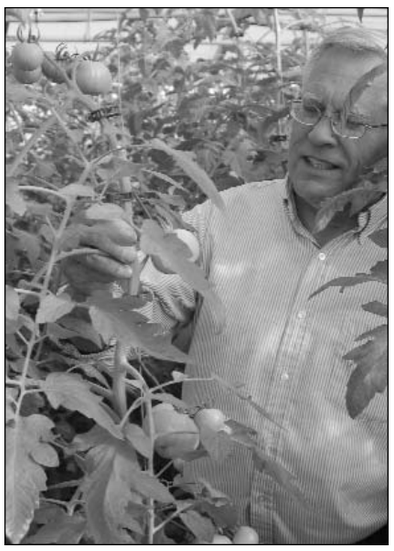
Early study results show that, during their first semester at school, the students gained an average of 2 pounds and had significant increases in body fat—from 14.2 percent to 15.1 percent for males and from 22.2 percent 23.2 percent for females.

The students will return for their third and final weigh-in of the year in late April.

The study will run through 2010. Gropper and Zizza hope to increase the number of freshmen participating in the study in the 2007-08 and subsequent school year. Financial incentives are used to recruit students.

Study results will be used to develop intervention strategies aimed at helping freshmen avoid changes in weight and body fat content, the researchers say. ◆

**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.



**TILAPIA & TOMATOES—In a research and extension project in progress at Auburn, AU fisheries professor Jesse Chappell is evaluating whether an energy-efficient integrated system of producing fish and plants in greenhouses will prove profitable for Alabama producers. The system uses sunlight and a furnace fired by Alabama-grown corn to heat two greenhouses, one that holds large fish tanks filled with tilapia and the other housing tomatoes and leatherleaf ferns. In the system, water that passes through the fish system is pumped into the plant greenhouse, where it is used to water the crops. Above left, growers from around the state watch for tilapia to surface during a field day demonstrating the system. Right, research associate Bill Trimble checks out a crop of winter tomatoes growing in the plant greenhouse. Besides allowing for year-round production of tilapia, the system would give producers the opportunity to grow tomatoes in the winter and other horticultural crops during their off-seasons. One fish greenhouse can support up to six plant greenhouses, Chappell says.**

## *Saving water in the process(ing)*

Nine billion gallons of water.

Based on national averages, that's how much Alabama's poultry processing companies are estimated to use every year as they go about the business of processing broilers into products for human consumption.

Getting more accurate water-use data from these processors and garnering information that can be used to help them find ways to reduce water use and wastewater discharge are goals of a new AAES-funded study by AU poultry scientists Pat Curtis and Sarge Bilgili.

The scientists first will send the state's 19 poultry processing plants detailed written water-use surveys. Then, they will conduct nine in-plant audits in which they will identify strategies the plants could use to better conserve water and reduce wastewater discharge without sacrificing quality or safety. Those will be the basis for the creation of recommendations for all poultry processing plants.

The study should result in significant conservation of a valuable natural resource, less pollution and cost savings for processors.

The volume of water that processors nationwide use rose sharply in 1998 when new federal food safety regulations mandated that the companies increase the number of washers in their plants in order to ensure that poultry carcasses are clean. ◆

## Zeroing in on grape genes

Muscadine vines grow fine in Alabama, and Les Goertzen is out to track down why.

In a two-year AAES study that could have major implications for Alabama's burgeoning wine and grape industry, the AU plant evolutionary geneticist aims to pinpoint the genes responsible for the drought resistance, heat tolerance and disease resistance that are characteristic of muscadines and other wild native grapevine species.

Ultimately, the genes underlying these hardier traits could then be used to improve the grape cultivars that Alabama wineries attempt to grow now, often with limited success.

The result could be a boon to a grape, wine and related tourism industry that, despite less-than-ideal conditions, is growing in the state, Goertzen says.

According to the 25-member Alabama Wineries and Grape Growers Association, the number of wineries here stands at seven. ◆

## SEEKING YOUR INPUT

Intensive work is under way at Auburn to develop a mission and strategic plan for a new initiative, temporarily named the Institute of Natural Resources, that is bringing together the AAES, AU College of Agriculture, Alabama Cooperative Extension System and AU School of Forestry and Wildlife Sciences in an effort to better respond to the state and nation's agricultural and natural resource needs.

Institute Executive Director Larry Fillmer encourages your involvement in the planning process. To learn more about the institute and provide your input through an online survey, go to www.ag.auburn.edu/institute. ◆



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