AAES **Impact**

RESEARCH NEWS FROM THE ALABAMA AGRICULTURAL EXPERIMENT STATION

Summer 2009 *vol. 7, no. 2*

BENT OVER BENTGRASS—Mark Foshee, research technician at Auburn's Plant Science Research Center, examines one of dozens of creeping bentgrass cores collected from a golf course putting green in Auburn. College of Agriculture turfgrass management professor and AAES researcher Beth Guertal is using the cores in a study to compare different brands of bentgrass foliar fertilizers as to how well grass leaves take up nitrogen from each fertilizer and how well the fertilizers adhere to grass leaves after irrigation. Final results of the independent study, which Guertal launched in 2007, will give golf course superintendents unbiased brand-performance information they can use when evaluating their maintenance programs, Guertal says.

Lotus team builds global registry

The Auburn horticulture professor who since 2001 has headed a project evaluating lotus as a potentially profitable crop for Alabama nursery and aquaculture producers has been named international registrar for the genus *Nelumbo*, or lotus.

That means Ken Tilt and his Auburn lotus project team have the monumental task of developing and verifying an official global registry of hundreds of lotus cultivars worldwide—their names, detailed descriptions and their histories, along with photos. Auburn was named keeper of the registry by the International Waterlily and Water Gardening Society.

As a starting point, Tilt used the lotus team's online database for the 160 American, Chinese and other cultivars in Auburn's lotus collection and is adding cultivars from India, China and other countries as they are submitted. The registry, which will go online once IWGS members have deemed it official, will be a work in progress.

Auburn's lotus research already has prompted one Alabama nursery to grow the aquatic plants for wholesale and online retail market. ◆

Scientists probe ozone-damaged grass's effects on grazing animals

Ground-level ozone is a major air pollutant that, among its effects, limits growth and lowers the nutritive quality of grasses and plants in pasturelands and grasslands where livestock and wildlife graze.

Auburn professors Russ Muntifering in animal sciences and Art Chappelka in forestry, two veteran researchers specializing in air pollution's impact on vegetation and on the animals that graze it, are conducting a study as part of that research to determine how nutrients in ozone-damaged plants and grasses cycle through the food web: from the plants to the animals that consume them and back to the soil as waste products.

They are conducting the study on rabbits, not cattle, because the smaller animals' grazing habits and digestive systems are similar to those of cows, deer and other ruminants.

Currently, one group of rabbits is being fed forage harvested from pastures with elevated ozone levels; the second group's forage is from pastures with lower ozone levels. For both groups, the forage is in cube form now but will be given in loose form in the study's second phase.

The researchers theorize that, compared to the rabbits fed forage from low-ozone areas, those limited to the heavily ozone-damaged forage will grow at a slower rate, take in less digestible dry matter when the forage is in cubes and have altered diet-selection behavior when the food is in loose form.

The study's findings could lead to improved management practices for ozone-exposed pastures and grasslands that livestock and wildlife graze. They also could be used in the development of air-quality standards aimed at minimizing ozone's ecological impact on grasslands. ◆

IMPACT is a quarterly newsletter the Alabama Agricultural Experiment Station (AAES) publishes to inform state and federal legislators, public policymakers 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.

THE ORGANIC WAY—Auburn researcher Jan Garrett, second from left, shows participants in an organic vegetable gardening workshop at her farm how to apply amendments such as wood ash and compost to build the soil. (*Opelika-Auburn News* photo)

Organic work will aid tomato growers

Midsummer typically is the most challenging time of the growing season for organic tomato and pepper producers in Alabama, as heat, pests and diseases peak and join forces to wage war on their crops.

But Auburn scientists are working to develop integrated organic production systems that will help growers launch a counterattack.

The systems will be built around the results of field experiments that research fellow Jan Garrett and cohorts have been conducting in certified-organic plots both at Auburn and at Alabama Ag Experiment Station research centers since fall 2005.

They're testing different cover crops, soil amendments, tillage methods, fertilizer levels, tomato varieties, organic disease-control products and flowers for insect control, with the goal of developing proven production recommendations that can help growers beat midsummer's plagues and realize strong harvests all season long. ◆

Litter runoff may be less than assumed

Alabama's Sand Mountain region is big poultry-producing country, which means there's an abundant supply of poultry litter too. Poultry litter is a premium, nutrient-rich organic fertilizer, and livestock producers in that hilly northeast portion of the state have been applying it to their pastures and hay fields for years.

And for almost as long, the nitrogen- and phosphorous-rich stormwater runoff from litter-fertilized farmland has been considered a significant source of pollutants—primarily oxygen-depleting phosphorous—in surface water. Research by Auburn biosystems engineering assistant professor Puneet Srivastava and doctoral student Sumit Sen re-examines that widely held assumption.

The two initiated the project, conducted at the AAES's Sand Mountain Research and Extension Center on a pasture hillslope typical of the region's soil and geology, to better understand the processes involved in stormwater runoff production from and infiltration in pasture systems there.

Crucial to the study was a complex network of surface and subsurface sensors that, based on rainfall and other data the sensors collected from 2006 to '08, identified the major runoff-generating areas on the hillside. (Sen developed and built the sensor sytem because such a product is not available commercially.)

Based on analyses of the data, the researchers concluded that only 10 percent of the rain that fell on the study pasture during the project wound up as runoff. This suggests that subsurface flows in the region are significant and could be a key vehicle for transporting phosphorous from litter-fertilized fields to streams and rivers.

Srivastava currently is conducting a related research project at the site. If it confirms the first study's results, the findings could lead to significant changes in best management practices for poultry litter application to farmland, changes that would substantially reduce the adverse environmental effects. ◆

Scientist targets resistant mosquitoes

For decades, large-scale insecticide sprayings have proved effective globally in controlling mosquitoes and, subsequently, the life-threatening diseases they carry.

In recent years, however, mosquitoes have become resistant to those insecticides, and the concern is that mosquito-borne diseases, already the number-one killers of humans worldwide, will increase.

The research that insect toxicologist Nannan Liu has under way in her lab at Auburn could be key to a solution.

Liu is investigating the molecular mechanisms involved in the development of insecticide resistance and is identifying the genes that control mosquitoes' response to insecticides. A $401,500 grant from the National Institutes of Health's National Institute of Allergy and Infectious Diseases just awarded to her will fund the study's next phase, which is to determine how those genes interact in resistance development.

Liu's findings will be crucial in the search for novel strategies both to control resistant mosquitoes and to prevent resistance from developing.Grants from the Alabama Ag Experiment Station's Hatch and Multistate Program and Auburn University's Biogrant Program have been key sources of funding for the project ◆

Office of Agricultural Communications and Marketing
Alabama Agricultural Experiment Station
3 Comer Hall
Auburn, AL 36849