AAES **Impact**

RESEARCH NEWS FROM THE ALABAMA AGRICULTURAL EXPERIMENT STATION

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Immigration reform and rethinking weed control in nurseries

Roundup® is a potent, nonselective herbicide that's highly effective at wiping out weeds—and basically all other plant life it touches.

In his almost three decades as an AU horticulturist and AAES scientist, Charles Gilliam has never, ever advised nurseries to use Roundup to control noxious weeds that plague their ornamental crops.

But what if . . . what if sweeping immigration reform occurs, and the extensive affordable labor force that the nursery industry has relied on for decades to manually weed their container-grown crops literally disappears?

That distinct possibility is what has Gilliam thinking far outside the box on weed control. It's why, at test sites in Auburn and at the AAES's Ornamental Horticulture Research Center in Mobile, he is spraying Roundup at varying strengths over a broad range of nursery crops.

His goal is to determine if there is a rate at which the nonselective herbicide could be applied on certain species at certain stages of development without damaging the plants and sacrificing quality.

Several widely grown nursery crops have shown remarkable tolerance to Roundup, and many other species, though they suffer foliar burn initially, fully rebound, putting on healthy new growth and thriving.

Gilliam is creating a database detailing his findings—*not* as a standard guide for producers, but as an emergency resource growers facing serious weed infestations and a nonexistent workforce could resort to. ◆

Maximizing profits on switchgrass

The case for growing switchgrass as a biomass energy crop got another major boost in January when the National Academy of Science reported not only that the native perennial prairie grass produces five times more renewable energy than the energy it takes to produce the crop but also that it offers substantial environmental benefits over conventional fuel.

For farmers, switchgrass has strong profit potential. It is high-yielding—up to 15 tons of dry biomass harvested per acre on some AAES test plots, with a six-year per-acre average of 11.5 tons. It is also naturally resistant to many pests and diseases, hence less need for chemicals, and it's highly tolerant of drought, floods and poor soils.

But in a new AAES-funded study, a trio of AU agronomists and soil scientists intend to unearth key information that will help growers get the most bang for the least buck on their switchgrass crops.

In the first phase of the three-year project, Edzard van Santen, Wes Wood and Charles Mitchell will be analyzing the amounts of key nutrients—primarily nitrogen, phosphorus and potassium—that are removed from the soil when swtichgrass is harvested. Using that information, the researchers will establish solid soil fertilization recommendations producers can rely on to maximize their profitability.

David Bransby, AU agronomy and energy crops professor, has been studying switchgrass as biomass for two decades. A new project at AU will focus on enhancing growers' profits.

The study's focus then will shift to genetics and a search for switchgrass varieties that have superior yields and minimal nutrient requirements. Such information will lay the groundwork for a switchgrass breeding program.

The switchgrass test plots will be located at the AAES's agricultural research centers in Winfield and Brewton. ◆

Making raw oysters safe for the masses

A new oyster-purification system that an AU research team led by AAES fisheries microbiologist Cova Arias has developed is still in the testing stages, but it could prove highly effective in ensuring that raw Gulf oysters are safe to eat.

The method, being put to the test at the AU Sea Lab in Dauphin Island, aims to eliminate the potentially fatal bacterium *Vibrio vulnificus* from raw oysters by using a novel depuration, or cleansing, system in which seawater piped in from the Gulf and treated with UV filters to kill the naturally occurring *V. vulnificus* flows into and out of tanks containing contaminated oysters.

Other depuration apparatuses exist, but unlike Arias' flow-through technique, they all recirculate water through the tanks.

V. vulnificus can be in all seawater—and oysters—but it thrives in the high-temperature, low-salinity Gulf of Mexico, and consumer fears that raw Gulf oysters are a health risk stifle demand and price. Arias is optimistic the provisionally patented flow-through system will reduce the bacteria to undectable levels and ultimately give Alabama and Gulf oysters a competitive edge. ◆

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.

LOTUS IN BLOOM—Six years of AU horticulturists' work to develop the lotus into an alternative crop for Alabama farmers will move from the lab to the marketplace in April when 4,500 of the aqautic plants that have been forced into early bloom at a south Alabama nursery will be sold in independent garden centers nationwide. Look for more in the next AAES Impact.

SOMETHING'S FISHY WITH DELTA BASS

Fishing is good in the Mobile-Tensaw River Delta, especially if you're angling for largemouth bass. They are there in abundance.

But these Delta bass, they're different. They don't get big (five-pounders and any over 15 inches are rare); they start reproducing far earlier than other bass; they don't live as long as largemouths elsewhere; and they're shaped like, well, footballs.

Anglers' concerns over the size of Delta bass prompted AU fisheries ecologists Rusty Wright and Dennis DeVries to launch an investigation six years ago. The study is ongoing, but so far, they've found that Delta bass differ genetically from other largemouths, probably due to eons of isolation from bass outside the Delta.

The genetic differences may explain why, compared to other bass, the Deltas are shorter, fatter and thicker in the middle. Easy access to saltwater shrimp and crabs in the brackish waters near Mobile Bay probably doesn't hurt, either. ◆

Keeping the yolks out of the whites

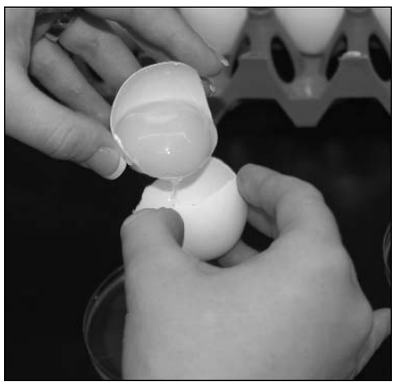
As any seasoned baker knows, let just a smidgen of egg yolk drop into your egg whites, and you can dash any plans to whip those whites into mounds of soft, glossy peaks. The fat in that tiny bit of yolk is enough to reduce the foaming abililty of the whites.

In egg-processing plants, clean separation of whites from yolks is a top priority. Every batch of whites must be tested for yolk contamination; any level over 0.05 percent is unacceptable.

But the current methods available to the industry for measuring yolk contamination are unreliable, laborious and time-consuming; they lack the sensitivity to read below that 0.05 percent upper limit; and they require costly equipment that is expensive to maintain.

Clearly, what the industry needs is a rapid, simple, accurate and inexpensive option.

Thanks to AU poultry scientist Wallace Berry, they soon will have that—and more, because the assay Berry is developing and for which he has applied for a provisional patent can detect yolk contamination at less than 0.01 percent.



This is the at-home version of separating eggs, but egg-processing plants use machines that break and separate thousands of eggs per hour.

In technical terms, Berry's new method—which he's now adapting for industrial settings— uses a yolk marker protein to detect the presence of yolk in egg whites. Current methods measure yolk lipids, or fats.

Berry expects the new procedure to be licensed to a third party and marketed to the industry, with royalties from sales accruing to AU, the College of Agriculture and the Department of Poultry Science. ◆

Stressing out at day care?

Children in day care who feel insecure in their relationships with their teachers tend to have elevated levels of the stress hormone cortisol, AU child development professor Jacquelyn Mize has found.

Cortisol is an essential hormone needed to regulate energy; it also prepares your body to respond to stress—by raising blood pressure and blood sugar, for instance. Cortisol levels naturally peak in the early mornings and then decline.

But previous studies indicate that for some children in day care, cortisol levels actually increase as the day goes on. Mize, an AAES researcher, decided to investigate whether a correlation might exist between irregular cortisol levels and bumpy child-teacher relationships.

It apparently does, she found.

In the study of 4-year-olds in day care, children who had dependent, or "clingy," relationships with their teacher tended to have higher afternoon cortisol levels, and children who were antagonistic toward their teacher experienced cortisol increases in one-on-one intereactions with him or her.

Long term, high cortisol levels can have adverse physical and psychological effects. Mize said the study data can be used to train day care teachers to be more sensitive toward and have more positive relationships with the children. ◆

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