

# LOUISIANA AGRICULTURE

*Assuring Our Future Through Scientific Research and Education*



Spring 2005  
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Landscape and Nursery Industry Issue



**ON THE COVER:** The All-America Rose Selections Display Garden at the Burden Center in Baton Rouge put on a particularly gorgeous show during the spring of 2005, said Pat Hegwood, resident coordinator. Many rose varieties have been evaluated over the years for their landscape performance characteristics and their susceptibility to black spot and other diseases troublesome to rose gardeners in Louisiana. See story on page 11. Photo by Mark Claesgens.

## LSU AgCenter helps Louisiana 'Get It Growing'

No matter where you are in Louisiana, you can receive educational information to help you with your lawn and garden. One way we assure this is by offering a program called "Get It Growing," featuring one of our horticulturists, Dan Gill.

The "Get It Growing" campaign features a weekly 60-second television spot, daily (Monday through Friday) 60-second radio spots, weekly newspaper columns and a yearly pictorial calendar.

If you haven't seen one of the television spots yet, you need to. They feature a single concept and after 60 seconds, you'll know exactly how to plant a flower, prune a shrub and prepare your lawn for summer. So far, five television stations use the spots regularly, according to Bobby Soileau, who produces them.

Alexandria – KALB-TV – Wednesday during the noon to 12:30 p.m. news program

Baton Rouge – WAFB-TV – Saturday or Sunday between 7 a.m. and 8 a.m.

Lake Charles – KPLC-TV – Tuesday or Thursday between 5 a.m. and 5:30 a.m.  
Monroe – KNOE-TV – once a week (day varies) during "Good Morning, Ark-La-Miss," which runs from 6 a.m. to 8 a.m.

Opelousas – KDCG-TV – Friday, 6:30 p.m. "Acadiana Today" (re-airs Saturday at 10 a.m.)

We also video-stream these spots on our Web site. So, if you miss them on television, you can go to the "Get It Growing" page on the LSU AgCenter's Web site ([www.lsuagcenter.com](http://www.lsuagcenter.com)) and watch the spots on your computer.

You can listen to the radio spots on our Web site as well. Some Louisiana radio stations download them directly from the Internet. But Tobie Blanchard, the producer, also sends CDs to 70 stations, including the Louisiana Network, which regularly airs the spots.

The newspaper columns, edited by Tom Merrill, provide more in-depth information on topics such as planning for colorful summer gardens, using ground covers and adding irises to your landscape. Thirty-four Louisiana newspapers use them weekly. If you'd like your local paper to carry them, give the editor a call. The columns are sent free as an e-mail service to anyone who wants them. If you collect all of the columns, you'll have a comprehensive guide to gardening in Louisiana.

A new addition to the lineup is the 2005 Get It Growing calendar. Not only is it an eye-catching decoration for your wall but it's chock full of gardening tips for each month. The introduction features "Amazing Azaleas." The back section has an illustrated guide to building a landscape bed. You can still receive a copy or order your 2006 calendar by contacting Elma Sue McCallum at (225) 578-2462 or [emccallum@agcenter.lsu.edu](mailto:emccallum@agcenter.lsu.edu). ■ **Linda Foster Benedict**

Photo by Bobby Soileau



Dan Gill

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# LOUISIANA AGRICULTURE

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Photo by Bruce Schultz

## 'Push boats' help crawfish farmer cut costs

IOTA – Acadia Parish farmer Gerard Frey figures he has cut costs and increased production of crawfish by using push boats instead of mechanized watercraft to harvest his crop.

Among the reasons, he said, is that it's inevitable a motorized boat will run over several traps during harvest, and those traps cost \$7.35 each. Frey uses 7,500 traps on 350 acres.

"It got to the point I was replacing 20 percent of my traps a year," he said.

A worker using a push boat wades in the water, and the boat is human-powered – which is slower but allows a harvester more time to place the trap in the water with no chance of it falling over. Frey believes his traps last longer that way, because they aren't yanked out of the water from a moving boat.

Frey's push boats have rods that serve as anchors to prevent the wind from blowing them off course when a worker stops to pick up a trap.

One of the main reasons he made the switch to push boats was to save his land,



Iota farmer Gerard Frey says using push boats like this one has reduced his costs and increased production of crawfish on his farm. Frey said another major advantage is less damage to his land, which also is used to grow rice.

he said. The big motorized paddlewheel boats cut big ruts in the field, and the ruts get wider and deeper with each pass of the boats.

That disturbance creates expensive problems when it comes time to plant a rice crop, he said, explaining that the fields used for crawfish also are used to grow rice.

Even though the depressions from motorized boats were being backfilled, the soil doesn't have time to compact, according

to Frey, who said the result is a soft area where machinery can get stuck. "The land literally does not heal," he said.

Frey keeps one hydraulic paddle wheeler that can be used to help catch up on orders, but he tries to keep its use to a minimum. He believes that the larger motorized boats kill crawfish as they drag the muddy bottom.

Ray McClain, an LSU AgCenter crawfish specialist at the Rice Research Station in Crowley, said no research has been conducted – although he said he's confident crawfish are quick enough to avoid being run over by the slow-moving boats.

"One county agent, several years ago, got down on his hands and knees on several occasions and followed a wheeled push boat for a ways and could not find a single dead crawfish as a result of the boat," McClain said.

McClain said push boats, which cost less but require more labor, traditionally have been used on small ponds.

■ Bruce Schultz

## Not your 'garden variety' show

Photo by John Wozniak



The LSU AgCenter offers major garden shows each spring in New Orleans, Lake Charles and Baton Rouge. Alan Morgan, left, and Tom Koske, seated, both professors in the Department of Horticulture, staff the plant clinic at the 2005 Baton Rouge Spring Garden Show, which was held March 19-20 in the John M. Parker Agricultural Coliseum on campus. And that's what's unique about the AgCenter-sponsored shows – they provide educational information. Participants can learn to grow plants and do landscaping as well as buy products.

## Sugarcane rind shows promise as building material

LSU AgCenter researchers recently completed a study that shows promise for the economic feasibility of using sugarcane rind as a supplemental raw material for manufacturing oriented strand board (OSB) and similar products.

Structural wood-based composites such as OSB are gaining increased use in both residential and commercial applica-

tions, said Qinglin Wu, the Roy O. Martin Sr. Professor of Composites/Engineered Wood Products in the LSU AgCenter's School of Renewable Natural Resources. They are widely used as sheathing, flooring and I-joist materials in construction.

With the cost of wood fibers more than doubling in the past 20 years, alternative materials for OSB production are being studied, Wu said.

"The technology is there. Someone would have to invest either in a stand-alone facility or an add-on to a processing facility," said Richard Vlosky, director of the LSU AgCenter's Louisiana Forest Products Development Center.

Wu said a separation facility adjacent to a sugar mill could divide the cane into its various parts, supplying juice to the mill while the rind could be shipped off to be used for OSB.

"The potential is there," Wu said. "A lot of components can be extracted – though some technical issues have to be worked out."

Vlosky said a survey indicated growers are looking at alternative uses for sugarcane.

"Almost nine out of 10 growers said they would grow sugarcane for rind production if it was more profitable than growing sugarcane for sugar," Vlosky said. "The product itself is solid from a structural standpoint. A 50-50 combination of sugarcane rind and wood is actually stronger than just wood alone."

The research was jointly funded by the American Sugar Cane League and Louisiana Economic Development.

■ Rick Bogren

## Compost 'for the road'

Highway construction moves a lot of dirt around, and with construction comes the potential for erosion.

Louisiana's Department of Transportation and Development uses silt fences and hay bales to slow erosion and improve water filtration and quality, but members of DOTD are investigating the



Photo by Rick Bogren

*Qinglin Wu (left) and Richard Vlosky examine a piece of oriented strand board (OSB), which is composed of 50 percent sugarcane rind. The researchers say it is significantly stronger than OSB made from wood alone.*

use of compost in filter "socks" for erosion control on state and private highway projects.

The LSU AgCenter's Callegari Environmental Center, which specializes in composting, brought together members of DOTD, the state Department of Environmental Quality and representatives of agencies in Texas who use these compost systems.

Callegari coordinator Bill Carney said the compost filter sock system is more effective than conventional methods.

"Silt fences are skimpy. They don't hold up," he said. "If you get a flow against them,

the flow blows them over, so erosion keeps on going and the sediment keeps on flowing. But you don't get that with the filter sock."

With the filter sock system, various types of compost are pumped into large socks, which can be used along eroding road banks or placed around construction sites. Compost can be made from yard trimmings, agricultural byproducts such as bagasse or rice hulls, or even biosolids such as highly treated sewage sludge.

"They'll use compost and wood chips in this sock, and they vary the degree of compost as compared to wood chips to vary the degree of filtration," Carney said.

A unique feature of a filter sock is it does not need to be removed once on a site.

"It will support plant growth," Carney said. "So you don't have to go back in and tear it all up and disturb the land once again to get it out of there."

Carney sees potential for economic development through the creation of businesses to supply the compost for the socks. When the Texas Department of Transportation and Development started using compost systems, there was only one compost supplier, Carney said. Now there are 18. Carney believes the same can happen in Louisiana.

DOTD's new-product evaluation committee will be testing the compost filter socks. ■ **Tobie Blanchard**



Photo by Mark Claesgens

*Rod Tyler (left) of Filtrexx International LLC of Grafton, Ohio, pumps a special compost mix into a "sock" while Robert Dodds of Bob's Tree Preservation of Church Point, La., which prepared the compost, monitors the flow. Once filled, the sock can be placed to filter sediment from storm water or to help erosion control. These new uses of compost were introduced at the LSU AgCenter's Callegari Environmental Center in Baton Rouge.*

# Horticulture: *A Dynamic Influence*

David G. Himelrick

Those of us who have the privilege of being a professional horticulturist enjoy the reward of knowing that we directly touch the lives of every single citizen in Louisiana every day.

The word horticulture has its origins in the Latin words *hortus* and *cultura*, which mean garden and culture. Today its meaning goes far beyond the culture of gardens. Horticulture is that branch of agriculture concerned with the intense cultivation of high-value crops produced for food and medicine and for enjoyment, recreation, and general environmental improvement.

Horticulture is big business. It provides employment for people with a wide variety of skills and is supported by many service industries. When considered from both the science and business perspectives, horticulture can be more broadly defined as the science and art of cultivating, processing and marketing of fruits, vegetables, nuts and ornamental plants.

The horticulture industry is subdivided according to products and their uses. The production of edibles is represented by pomology (fruit crops) and olericulture (vegetable crops); the production of ornamentals is represented by floriculture, nursery crops and landscape horticulture. These terms are not mutually exclusive. For example, many edible plants (apples) are used as ornamentals, and many plants often classed as ornamentals (poppy, pyrethrum) have pharmacological and industrial uses. Likewise, when pine trees are planted for pulp wood, we would consider it forestry, but when someone plants and intensively manages a Christmas tree plantation, we would classify it as a horticultural enterprise.

The esthetic use of plants distinguishes horticulture from other

Ornamental horticulture has undergone a renaissance brought about by an increased standard of living coincidental with the development of suburban living.

agricultural activities. In the United States, ornamental horticulture has undergone a renaissance brought about by an increased standard of living coincidental with the development of suburban living. This has expanded an industry that formerly had been confined to well-to-do fanciers.

Though an ancient art, horticulture has developed into a science, which has served not only to provide the methods and resources to explain the art but has also become the guiding force for its improvement and refinement.

It is difficult to ascertain the precise economic impact of horticulture on our economy. Horticulture involves not only the many facets of production, but the added increments of processing, service and maintenance. For example, ornamentals such as woody perennials are not consumed but are invested in

plantings, which increase in value with the passage of time. The value of this wealth is ordinarily not taken into consideration until we become painfully aware of it through the tolls taken by severe weather or the encroachment of concrete and steel.

With gardening being the No. 1 outdoor leisure time activity in America, the value of horticultural crops and horticulture-related products is enormous. People want to interact with plants. We find them to be esthetically therapeutic in our offices and homes as well as an effective mechanism for removing indoor air pollutants. For apartment dwellers, containerized gardening on a small balcony can be a focal point of beauty with a hanging basket or the source of a fresh tomato for a salad.

For homeowners the lawn is often a source of beauty and pride as well as a place for kids to play, the dog to run and families to gather for crawfish boils. LSU AgCenter turfgrass research and extension efforts serve not only homeowners, but golf courses, athletic fields, parks and cemeteries. The nursery, greenhouse, landscape and garden center industries have experienced notable economic success over the past several decades. Extension and research efforts have been expanded to meet the need for information in this branch of horticulture.

With the changing demographics of our state and the continuing shift from rural agriculture to urban agriculture, the LSU AgCenter will continue to serve the needs of its diverse clientele. The curious mixture of science, technology and esthetics makes horticulture a refreshing discipline that absorbs people's interest and challenges their ingenuity. Indeed, the rise of the world environmental movement resulted in a virtual explosion of interest in plants and gardening, an interest that shows no sign of waning. The science of horticulture remains a dynamic influence on our lives. ■



David G. Himelrick

Photo by John Wozniak

David G. Himelrick, Professor and Head, Department of Horticulture, LSU AgCenter, Baton Rouge, La.

## Louisiana's Growing Green Industry

Roger A. Hinson and Allen D. Owings

The green industry (nursery, landscape, greenhouse, sod and allied industries) is growing in Louisiana and nationally. This growth is fueled by changes in consumer incomes and demographics. Consumers continue to allocate a portion of their increased incomes to home improvements. An important component of growth results from baby boomers' (individuals born between 1946 and 1964) choices. Generally speaking, people in this group have accumulated assets during their careers and have dedicated a portion of those assets to improving homes or moving to larger and more expensive homes. Baby boomers, like most other age groups, continue to demonstrate significant interest in gardening.

The latest National Gardening Association survey indicates that 78 percent of all U.S. households participate in one or more types of do-it-yourself lawn and garden activities, a rate that is growing at an annual rate of 5 percent. Almost all of these households purchase various products to support gardening activities. The average nationwide expenditure per household is nearly \$460 – a value that has stayed at about the same level over the past five

years – for a total of more than \$38 billion spent on do-it-yourself lawn and garden products. For every \$1 dollar consumers spend on green goods, they spend another \$3 for other products and supplies.

In addition, households annually spend more than \$31 billion for professional lawn and landscape services, landscape installation and construction, landscape design services and tree care services. These services have grown at a rate of 13 percent per year over the past five years.

### Wholesale Sales

Growers have benefited from consumer demand. From 1995 to 2003, sales of nursery and greenhouse crops by Louisiana growers increased from about \$105 million to about \$122 million, according to LSU AgCenter estimates. Another indicator of growth has been in the services sector, where sales by horticultural services firms, such as landscapers, increased from \$146 million to \$266 million over the period 1995 to 2001.

The green industry is an important contributor to the general economy as the result of value-added activities.

Farm production requires extensive quantities of materials, and since production is not yet extensively mechanized, it requires a relatively large amount of labor.

### Changing Market Channels

Nursery products move to market through sales to retailers, landscapers and wholesalers. The portions moving through these channels have changed over time, according to surveys of growers. In 1988, the landscaper market was responsible for the largest portion of sales at about 40 percent, but that value fell to 24 percent in 1998. Over the same period, sales to retailers fell from nearly 41 percent to 35 percent. Sales to wholesalers, however, grew from about 19 percent to 38 percent for small growers and from 16 percent to 48 percent for large growers. The portion that went to direct retail was small and changed little. Overall, wholesalers have become a more important component of the industry. However, each channel adds value to the product.

### Economic Impact

A recent study showing the industry's economic impact on the state included producers (farmers and the landscape services industry), golf (including all revenue and expenses), retail sales (garden centers, mass merchants, florists and others) and a category of other industries with extensive horticultural activity. The latter category was included in the study because industrial classifications put



Roger A. Hinson



Allen D. Owings

Photo by John Wozniak

*Roger A. Hinson, Professor, Department of Agricultural Economics and Agribusiness, and Allen D. Owings, Professor, Department of Horticulture, LSU AgCenter, Baton Rouge, La.*

companies into specific industries and attribute all of an industry's sales and expenses to its major activity.

Construction is an example. Building and remodeling are the main activities, but installation and maintenance of landscapes are required too. This portion of output was identified and attributed to the green industry because it is similar in nature to other activity reported as landscape services.

In addition, landscape maintenance activities by a variety of public and private institutions, such as churches, schools and other public agencies, are either contracted out or hired and are included to the extent possible.

A model that estimated the economic impact from all sources showed that Louisiana's green industry was responsible for about \$2.2 billion in gross sales, provided nearly \$1.2 billion

in personal income to business owners and employees and contributed nearly \$1.7 billion to the gross state product. The green industry also was responsible for around 56,700 Louisiana jobs.

The nursery and landscape industry has important linkages, influence and substantial effects on other sectors of the economy. ■

# Risk Management for Nursery Growers

Roger A. Hinson

In the nursery business, as in the rest of agriculture, uncontrollable events such as weather, changes in markets or currency valuations cause product prices to rise or tumble. These factors can change revenues and expenses. This risk may be managed to a certain extent by individuals and government-sponsored programs. Farmers who produce major field crops such as corn and cotton have had programs including acreage controls, price floors and ceilings, loans, crop storage programs, disaster payments and others to mitigate these risks; growers of specialty crops (mostly fruits, vegetables and nursery plants) have fewer of these tools.

However, producers of specialty crops have freedom to change the quantities they produce and sell based on market demand. In the nursery industry, growers develop their own customer base and often attend trade shows where producers and customers gather. Another important factor in risk management for these growers is the absence of a central marketplace where prices are determined by market forces; prices for specific grades of products are not collected and reported. These factors suggest that the quantities of products coming to market, and the prices for those products, are not easy to predict.

All agricultural producers face several forms of risk:

- Production risks (weather, diseases, pests)
- Market risks for both inputs and outputs
- Financial risks that include the exposure of borrowing and repaying
- Institutional risks that include governmental actions such as tax laws and regulatory changes
- Human or personal risks (accidents, illness, death)

Nursery growers have access to a set of management tools and strategies available to the general agricultural community – crop diversification, debt management, contract sales, insurance and off-farm employment. But other important tools, such as use of futures markets, are not available.

Traditional farm management research and extension programs provide an opportunity to learn about management of risk:

**Planning and budgeting** facilitate informed decision-making, cash flow projections and capital planning.

**Crop diversification** may offset weather and disease risks by matching crops so that if one crop fails, another has a reasonable chance of succeeding. Appropriate diversification, however, may reduce potential revenue even as it stabilizes income.

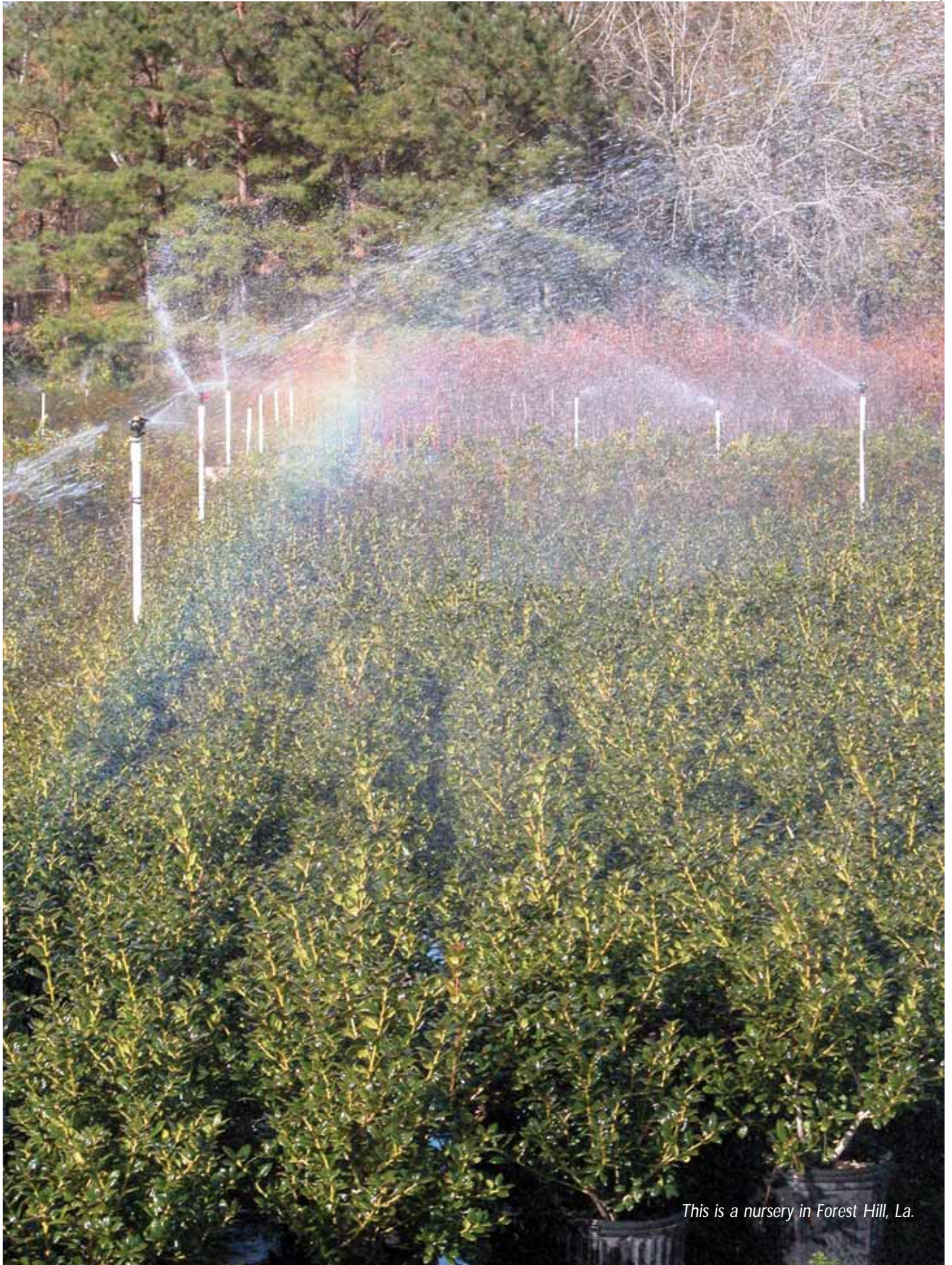
**Market diversification** can work in a similar way. For example, in the early 1980s some Louisiana growers focused their sales efforts on the Texas market, particularly Dallas and Houston, because those markets were strong. An unexpected recession left those growers with few alternatives and with potential financial problems. In other cases, growers have dedicated large portions of their crops to specific buyers such as mass merchandisers that are sensitive to price and will switch suppliers if they can buy for less. This illustrates the riskiness of reliance on a single channel.

**Crop insurance** transfers risk to those who, for a price, are willing to accept it. Insurance protects against losses, thereby stabilizing revenues. It is intended to manage risks and protect income, not to be an investment. It is one tool in the risk management arsenal to help assure that the farm can weather adverse conditions. Nursery growers can buy multiple-peril crop insurance to insure against yield losses from most natural causes and can buy revenue insurance for situations where gross revenue falls below a specified level. In addition, growers may be included in government disaster programs and may be eligible for emergency loans that are direct payments to farmers when yields are affected by adverse conditions such as storm or drought.

The U.S. Department of Agriculture's Risk Management Agency reports insurance has been used by some Louisiana nursery growers. The "nursery field grown and container" program, which is available in 64 parishes, sold 50 policies with insured value of almost \$12.8 million in 2004.

In contrast to row-crop farmers, nursery growers and other specialty crop producers traditionally have relied on market-oriented activities, marketing skills and trade shows to sell their products. In addition to the traditional management recommendations that serve to reduce risk, insurance programs are tools to manage revenue risk. Growers should evaluate all the tools available to assure a consistent income stream, adequate to meet business and family needs. ■





*This is a nursery in Forest Hill, La.*

# BURDEN CENTER

## Home to Ornamental, Turfgrass Research

Allen D. Owings, Edward W. Bush, Jeff S. Kuehny, David J. Lee and C. Patrick Hegwood

Five years ago, the LSU AgCenter decided to dedicate a 20-acre site at Burden Center in Baton Rouge as a home for ornamental and turfgrass research and demonstration projects. And it has flourished ever since. The site is now filled with research and demonstration plots and provides a place for faculty members in horticulture and other departments to conduct various studies to benefit Louisiana's growing green industry.

Photo by John Wozniak



The All-American Rose Garden is in front of the Orangerie at the Burden Center. This building was designed by A. Hayes Town, a famous Baton Rouge architect, now deceased.

Allen D. Owings, Professor; Edward W. Bush, Associate Professor; Jeff S. Kuehny, Associate Professor; David J. Lee, Assistant Professor; Department of Horticulture, Baton Rouge, La.; and C. Patrick Hegwood, Professor and Resident Director, Burden Center, Baton Rouge, La.

The primary beneficiaries of this new site – officially called Ornamental and Turfgrass Research and Extension Facility – are ornamental and turfgrass professionals in Louisiana. These include wholesale nursery growers, wholesale greenhouse growers, athletic field managers, sod producers, golf course superintendents and retail garden center personnel. Ultimately, the consumer benefits from better products.

Burden Center itself covers 434 acres and is conveniently located on Interstate 10 in the center of the city. It also is home to the well-known Rural Life Museum and companion Windrush Gardens. The center was owned by the Burden family from the mid-1800s until the early 1990s when the final segment of land was donated to the LSU AgCenter.

Most of the site development for the ornamental program has been completed. Site development to support the turfgrass program is planned for 2005. When completed, the facility will house a 1-acre container yard, 3 acres for field nursery crop production, 2 acres for landscape plant evaluation and 5 acres for turfgrass research. Weed research plots will support the ornamental and turfgrass industries. Greenhouses, shade structures, an equipment storage building and office space are also on the site.

Research projects being conducted include:

- Earth Kind rose cultivar evaluation
- Cool-season herbaceous plant evaluations in the landscape
- Warm-season herbaceous plant evaluations in the landscape
- Live oak pruning and cultivar evaluation
- Herbaceous perennial evaluations in the landscape
- Daylily cultivar and rust evaluation
- Greenhouse production of ornamental ginger
- Specialty cut flower scheduling and postharvest
- Clerodendrum breeding, selection and greenhouse production
- Weed control in ground covers
- Tropical plant (cannas, bananas) evaluations in the landscape
- Production of shrubs as influenced by media physical properties
- Post harvest plant quality retention as influenced by wholesale production practices
- Jackson and Perkins rose rootstock study

The AgCenter is making an investment to the ever-expanding green industry in Louisiana. A recent study by the AgCenter shows the green industry contributes \$2.2 billion annually to Louisiana's economy. ■

### Acknowledgment

The Louisiana Nursery and Landscape Association has provided more than \$60,000 to support development of this effort.



Photo by John Wozniak

# Rose Research Expands

Allen D. Owings, Gordon E. Holcomb, Anthony L. Witcher and C. Allen Broyles

The LSU AgCenter has long had an All-America Rose Selections Display Garden, first at the Hill Farm location on the LSU campus and now at Burden Center in Baton Rouge. Many rose varieties have been evaluated over the years for their landscape performance characteristics and their susceptibility to black spot and other diseases troublesome to rose gardeners in Louisiana.

A new, cooperative effort with Texas A&M University has been initiated to evaluate the performance of Earth Kind roses in the Baton Rouge area. These traditional roses are recommended by Texas A&M because of their low maintenance requirements and reduced susceptibility to powdery mildew and black spot. Some varieties included are Spice, New Dawn, Louis Philippe, Nacogdoches, Puerto Rico, Georgetown Tea, Mrs. Dudley Cross, Reve d'Or, Ducher, Marie Pavie, Carefree Beauty, Belinda's Dream, Mrs. B. R. Cant, Bon Silene, Maggie, Mutabilis, Isabella Sprunt, The Fairy, Pinkie, Perle d'Or, Cecile Brunner, Caldwell Pink and Kirsten Poulsen.

Some varieties were planted in 2003, with additional varieties added in March 2004. Unfortunately, powdery mildew has been a major problem on most of these varieties already. So, we can see that because of the varying climatic conditions between Louisiana and Texas, some varieties recommended for Texas may not do well in South Louisiana. Initial data have been collected, and updates will be provided on this project over the next couple of years.

In another project with Jackson and Perkins, a well-known rose grower, we are evaluating own-root roses (those that are not grafted) versus budded roses (those that are grafted) in a landscape setting. Jackson and Perkins recently began marketing some of their

rose varieties, which are being called New Generation roses. Ten varieties are included in this study. The study was initiated in February 2003 and will continue through the fall of 2005.

Data from the 2003 and 2004 seasons indicated only slight differences in flowering and landscape performance.

Many rose growers are now marketing own-root rose bushes instead of budded or grafted bushes because of efforts to improve establishment, growth and long-term performance in the landscape. Additional information and results from this study will be available later from the AgCenter. ■



Photo by Mark Claesgens

*The Burden Center covers 434 acres in Baton Rouge. It is located at the intersection of Interstate 10 and Essen Lane. The gardens are often open for public viewing.*

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# All-American Daylilies: *Performance and the Rust Threat*

Allen D. Owings, Gordon E. Holcomb, Edward W. Bush, Anthony L. Witcher and C. Allen Broyles

Interest in daylilies is still strong despite rust problems over the past several years. New daylily selections and All-American daylily winners need to be evaluated in the Gulf South for landscape performance.

A landscape trial evaluating the performance of All-American daylily cultivars – cultivated varieties – was initiated in 2003 at the Ornamental and Turfgrass Research and Extension Facility located at Burden Center in Baton Rouge. The All-American Daylily

Selection Council has named All-American daylilies annually since 2002. The winners are Chorus Line (2004), Lady Lucille (2004), Frankly Scarlet (2003), Plum Perfect (2003), Bitsy (2002), Judith (2002) and Leebea Orange Crush (2002). Winners named before 2002 include Lullaby Baby (1998), Starstruck (1998) and Black Eyed Stella (1994). Winners from 2005, Red Volunteer and Miss Mary Mary, have been added to the Burden Center planting.

Bareroot daylily plants were planted in February 2003 in a 4-foot-wide raised landscape row composed of an Olivier silt loam soil. Winners from 2004 were planted in spring 2004, and 2005 winners were planted in fall 2004. Plant beds are located in full sun, and plants receive irrigation from a drip system as needed to prevent stress during the growing season. Plants are individually spaced 24 inches apart and include three to five plants per variety. Rows are

mulched annually with three to four inches of baled pine straw. StaGreen Nursery Special 12-6-6 fertilizer at the rate of one pound of nitrogen per 1000 square feet is applied annually in mid March and at the rate of a half pound of nitrogen per 1000 square feet in early June. Plants are not dead-headed or pruned during the growing season, and no insecticides and fungicides are applied for insect and disease management. Weed control is done in the trial beds by hand removal supplemented with twice-a-season applications of granular herbicides.

Visual quality ratings were made weekly from mid April through October in 2003 and weekly from mid April through mid October in 2004. The visual quality ratings included growth habit and flowering, with favorable growth habit being compactness, foliage color, uniformity and overall aesthetics, and favorable flowering being longevity and visual appeal. Flower observations were

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Photo by Gordon E. Holcomb



*In the summer of 2000, daylily rust was reported for the first time in the United States. It has since spread across most of the country and continues to present problems for home gardeners, commercial landscapers and daylily growers.*

# DAYLILY RUST



Photo by Gordon E. Holcomb

## PROBLEM CONTINUES

In the summer of 2000, daylily rust was reported for the first time in the United States. It has since spread across most of the country and continues to present problems for home gardeners, commercial landscapers and daylily growers.

The LSU AgCenter and Louisiana Department of Agriculture and Forestry offer some guidelines first recommended by the Florida Department of Agriculture and Consumer Services and based on ongoing daylily rust research at the University of Georgia.

Infected plants should be cut back to an inch or less and treated repeatedly with labeled fungicides. Foliage from infected plants should be removed and destroyed. Infected plants should be isolated from other daylily beds and varieties. Fungicides recommended (for prevention more than control) are Systhane, Banner Maxx, Contrast and Heritage. All are systemic materials. Others to consider are Strike (systemic) and Dithane (protectant/contact). Most broad-spectrum contact and systemic fungicides may be somewhat effective and may be useful in combination; however, experience has shown that effectiveness is limited.

Home gardeners and growers should make note of varieties showing rust-like symptoms because these varieties may be susceptible. Research in several states is beginning to show major differences in susceptibility among varieties. It is now becoming commonplace for growers to remove moderately and highly susceptible varieties from production. Daylily rust infection occurs two to three days after leaf inoculation. The disease spreads quickly in nurseries and may kill the foliage. All known infections have been on the foliage and flower stalks.

For more information from the U.S. Department of Agriculture, go to: [www.aphis.usda.gov/npb/daylily.html](http://www.aphis.usda.gov/npb/daylily.html) ■

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made in regard to time in bud and peak blooming periods (Table 1 and Table 2). Daylily rust ratings were taken in September and November 2003 and in September and November 2004.

Visual quality ratings were average to above average for all cultivars through the 2003 and 2004 growing seasons. Peak performance seemed to be from about the time of bloom initiation in early May through August. Foliage decline and daylily rust appearance began in mid to late summer both years. Flowering observations in 2003 and 2004 indicated that Black Eyed Stella and Bitsy were the varieties showing the most repeat bloom potential (Table 1 and Table 2).

Daylily rust was observed on some cultivars by late season in 2003. Rust was most severe on Judith and Leebea

Orange Crush. Starstruck had rust symptoms in November but no symptoms in September. Plum Perfect, Frankly Scarlet, Bitsy, Black Eyed Stella and Lullaby Baby were least susceptible to daylily rust (Table 1).

Daylily rust was noticed for the first time in 2004 during the late summer months with Judith and Leebea Orange Crush being most susceptible again. By November 2004 significant rust was also present on Starstruck and Lady Lucille (Table 2).

Previous research at the University of Georgia has found Plum Perfect and Frankly Scarlet to be resistant to daylily rust. Black Eyed Stella has been classified as moderately resistant, while Judith, Leebea Orange Crush and Chorus Line have been classified as susceptible. ■

Table 1. Peak flowering times and daylily rust ratings for landscape planted All-American daylily varieties - 2003.

Varieties	Flower Bud Date	Flowering Dates	Daylily Rust Rating	
			September	November
Judith	April 26-May 3	May 10-May 24	5.7	6.0
Plum Perfect	May 3-May 10	May 17-June 14	1.0	2.7
Leebea Orange Crush	May 3-May 10	May 17-June 14	4.7	6.0
Frankly Scarlet	May 10-May 17	May 24-June 21	1.0	2.0
Bitsy	April 12-April 19; July 5-July 12	April 26-May 10; July 19-October 25	1.0	1.0
Black Eyed Stella	April 26-May 3; July 5-July 12; Sept 13-Sept. 20	May 10-May 17; July 19-Sept. 6; Sept 27-Oct. 25	1.0	1.0
Lullaby Baby	May 3-May 17	May 24-June 14	1.0	1.0
Star Struck	May 24-May 31	June 7-July 5	1.0	4.7

Note: Daylily rust ratings based on a scale from 1 to 6 where 1 = no rust present and 6 = 76-100% of leaves infected.

Table 2. Peak flowering times and daylily rust ratings for landscape planted All-American daylily varieties - 2004.

Varieties	Flower Bud Date	Flowering Dates	Daylily Rust Rating	
			August	November
Judith	April 26-May 3	May 10-June 13	3.0	6.0
Plum Perfect	April 19-April 26	May 3-July 18	1.0	1.3
Leebea Orange Crush	April 26-May 3	May 10-July 11	4.0	6.0
Frankly Scarlet	April 26-May 10; July 4-July 11	May 17-June 6; July 11-August 9	1.0	1.7
Bitsy	Mar 15-Mar 22; Aug 2-Aug 9	Mar 29-July 25; Aug 16-Sept 20	1.0	1.0
Black Eyed Stella	Mar 15-Mar 22; April 12-May 3; July 25-Aug 2	Mar 29-April 5; May 10-July 18; Aug 9-Aug 16	1.0	1.0
Lullaby Baby	April 19-April 26	May 3-June 6	1.0	1.0
Star Struck	May 10-May 24	May 31-July 11	1.0	3.7
Lady Lucille	April 26-May 3; June 13; July 4-July 11	May 10-May 31; June 20-June 27; July 18-August 9	1.0	4.0
Chorus Line	April 19	April 26-May 10	1.0	2.0

Note: Daylily rust ratings based on a scale from 1 to 6 where 1 = no rust present and 6 = 76%-100% of leaves infected.



Maria del Pilar Paz and Jeff S. Kuehny

Ornamental gingers encompass a diverse and versatile group of plants that are gaining increased popularity in the flowering pot plant, landscape and cut flower markets. They have showy and attractive foliage and flowers, which make them interesting ornamentals. The various sizes, flower colors and longevity (up to four weeks or longer) are adding needed diversity to the greenhouse industry.

Ornamental gingers are most commonly propagated by rhizomes – underground storage organs that serve as a major source of water and carbohydrates. Each rhizome has many lateral buds, which grow out above ground. In general, the outdoor growing period in Louisiana is seven to eight months, and flowering takes place for two to three months. Flowering initiates new rhizome formation.

A majority of these gingers are native to Southeast Asia, with production occurring predominantly in Thailand and China. In their native habitat, most gingers grow during the rainy season and go dormant during the dry season. If

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rhizomes are kept dry, they will remain dormant. In contrast to their native habitat, rhizomes in temperate climates enter dormancy in winter in response to short days and low temperatures. Rhizomes in commercial production are harvested when dormant for storage and distribution. Postharvest handling of the rhizomes can have a significant effect on time to emergence and uniformity of emergence.

One of the most popular gingers is the cucuma, which originates in northern Thailand and Cambodia. Cucumas comprise at least 65 species with different colors, forms and sizes. The inflorescence – or flower – is a compressed spike with colorful bracts that can develop from the shoot or directly from the rhizome.

For production of brightly colored bracts and deep green leaves, *Curcuma alismatifolia* and other species *Curcuma* should be grown in full sun. *Curcuma cordata* (photo at left) should be grown in 30 percent to 50 percent shade.

*Globba*, another popular ginger, have a pseudostem 20 to 30 centimeters tall, terminating with a pendent inflorescence of lavender, pink, white or yellow bracts accented by a slender, curved, yellow petal. Most *Globba* species grow best and flower under 30 to 50 percent shade.

The 50 species of the genus *Kaempferia* and the one species of *Cornukaempferia* are nearly stemless herbs with thick, aromatic rhizomes. They are grown primarily for their beautiful foliage. Most *Kaempferia* have a silver to purple feather pattern in the middle of the upper side of the leaf radiating outwards with various shades of green. Most of the *Kaempferia* species produce small white, pink or orange flowers. Each day a solitary flower emerges on a spike arising from the base of the plant and is replaced by another the following day. These gingers grow best under 30 to 50 percent shade. *Kaempferia rotunda* has proven to be one of the best *Kaempferia* for landscape planting. The plant has rounded leaves that grow close to the ground, producing a dense mound. Because the foliage of *Kaempferia* is its primary attribute, transplants from tissue culture will produce a nice pot plant.

Temperature is the primary factor affecting gingers' sprouting and growth and is commonly used to hasten or delay development. For a species to be used as a potted plant, it must be possible for growers to provide flowering plants within a specific time interval. Because gingers go dormant in the winter, they are suitable for growing as summer flowering potted plants and landscape plants anywhere in the United States. Most rhizomes are harvested from November to January in Thailand and shipped to the United States in February through April. Because gingers prefer warm growing conditions, they are good candidates for summer greenhouse or nursery production, fitting the lull between summer and fall.

All of the aforementioned gingers have been planted in the landscape at Burden Center in Baton Rouge. Overwintering survival also is linked to good mulching and to well-drained soil to prevent root rot. Thus, these plants can be marketed as a flowering potted plant year-round and as perennials in the landscape. The flower stems of all these gingers also make good cut flowers. ■

# SCHEDULING Specialty Cut Flower Production IN LOUISIANA

John B. Young and Jeff S. Kuehny

Photo by Mark Claesgens

Specialty cut flowers, or nontraditional cut flowers, have become increasingly important in agriculture. Typically, specialty cut flower growers are owners of small acreages that have the basic equipment for producing a horticultural crop. These growers enter the market on a small scale, usually selling their cut flowers at a farmers market, to an independent grocer or directly to a wholesale or retail florist. Maintaining a diverse product mix and a quality cut flower is vital to the growth of the specialty cut flower industry.

Growing specialty cut flowers is also dependent on a combination of climatic factors that affect flower quality and yield. The U.S. Gulf Coast has a mild winter climate that provides an earlier growing season than other parts of the country and a hot humid summer climate. The effect of climate can have both a positive and negative impact on production. To study how these factors affect production in Louisiana, four species of cut flowers were selected – gladiolus, celosia, sunflower and zinnia.

These species were planted to determine the number of days from planting to bud and the number of days from bud to harvest for four scheduled plantings of each species. The objective of this research was to determine production times so that a production schedule can be set for continuous production of product for the market. All crops were grown in an open field at Burden Center in Baton Rouge.

Plants were grown on 285-foot rows, 4 feet wide by 12 inches high in an Olivier silt loam soil. Soil tests were taken, and the pH was adjusted using limestone. Granular 13-13-13 fertilizer



Four species of cut flowers were selected for this study, including gladiolus. John B. Young is a former graduate student in the Department of Horticulture. The research was conducted at the Burden Center.

was incorporated, and further fertilization was applied through drip irrigation using a 20-10-20 liquid fertilizer. Solar radiation, air and soil temperatures were recorded over the growing period.

## Gladiolus

The average number of days to emergence (2001 and 2002) for gladiolus was 28 days for the earlier plantings (plantings 1 and 2 in February and March) and 15 days for the later plantings (plantings 3 and 4 in March and April). Therefore, the number of days to emergence was significantly affected by planting date by approximately two weeks.

The average number of days from emergence to bud was 57 days for the earlier plantings, and 53 days for the later plantings. The average number of days from bud to harvest was 7 days for the earlier plantings and 9 days for the later the plantings. The time from emergence to bud and bud to flower was not affected by planting date.

The days to emergence is the most significant factor affecting the number of days from planting to harvest. This did not affect days from planting to harvest in 2002, as days from emergence to bud increased by planting date. This increase could not be attributed to differences in air or soil temperature, or solar radiation. Table 1 indicates the average number of days for each stage of development, the average number of days from planting to harvest and the

Table 1. Average number of days for developmental stages for seven varieties of gladiolus.

	Deciso Supreme	Rose Pears	Peter Borge	Victor	Oscar	Traders-horn	Blue Isle
Planting to emergence	21	18	22	21	22	22	21
Emergence to bud	56	62	49	53	59	49	52
Bud to harvest	8	9	9	9	8	9	9
Total days to harvest	85	89	80	83	88	82	82

John B. Young, former Graduate Student, and Jeff S. Kuehny, Associate Professor, Department of Horticulture, LSU AgCenter, Baton Rouge, La.



Celosia was one of the flowers used in this study.

average stem length over the 2001 and 2002 growing season.

These results suggest that later planting dates may result in fewer days to harvest because of fewer days to emergence. The average days from emergence to bud, however, may negate this effect where the average days from plant to harvest may be similar.

### Celosia

Celosia is classified as a quantitative short day plant, which means it must have short days to flower. However, the number of days to harvest was slightly greater under short daylengths and cool temperatures. The average number of days (2001 and 2002) to bloom for the earlier plantings in March and April was 43 days; for the later plantings in April, May and June, it was 39 days. The number of days from

bloom to harvest for the earlier plantings was 35 days, and for the later planting date, it took 27 days. See Table 2.

Scheduling celosia at two-week intervals beginning in early March, then at three-week intervals for plantings beginning in May should provide a consistent supply, although stem length may be shorter for later plantings.

### Sunflower

The number of days from planting to bud is the most significant developmental stage when scheduling sunflower because it takes the longest. It took an average of 39 days to bud for both years for the earlier plantings in March and April (1 and 2) as well as for the later plantings in April, May and June (3 and 4). The number of days from bud to harvest took an average of 17 days for the earlier plantings and 21 days for the later planting dates. Sunflower was harvested an average of 57 days after planting from

March to July, but was delayed by an average of 26 days for the third planting in 2001.



Sunflowers were part of this study conducted by scientists in the Department of Horticulture.

Although the number of days to bud can vary over time, it is recommended that sunflower be scheduled at two-week intervals throughout the growing season for optimal production. See Table 3.

### Zinnia

The average number of days from planting to bud over both years for earlier plantings in March and April (1 and 2) was 34 days, while the later plantings in April, May and June (3 and 4) took an average of 35 days. The average number of days from bud to

Table 2. Average days for developmental stages and yields for four varieties of celosia.

	Bombay Salmon	Temple Belles Dark Rose	Kurume Corona	Supercrest Burgundy
Planting to bloom	33	40	41	35
Bloom to harvest	34	30	30	33
Stem length (inches)	18	30	34	29
Yield	Single stem	6	7	Single stem

Table 3. The average number of days for developmental stages and yield for seven varieties of sunflower.

	Valentine	Soraya	Ikarus	Claret	Joker	Full Sun	Sunbright
Planting to bud	38	36	42	44	37	41	39
Bud to harvest	19	22	20	19	18	21	22
Total days to harvest	60	63	63	63	55	62	61





Photo by Mark Claesgens

harvest was 17 days for the earlier plantings, but for the later plantings, it was 13 days.

Since zinnia is a fast-growing plant that may produce numerous stems over several months, it can be scheduled at three-week intervals to provide high yields throughout the growing season.

### Postharvest of Sunflower

It is a common belief that pollen-less varieties of sunflower have a greater postharvest life than pollen-producing cultivars. This may be due to pollen-less cultivars generally producing little or no pollen allowing for no pollenization and therefore more energy to prolong vase life. Postharvest longevity studies were conducted under simulated interior conditions at 75 degrees F and florescent light levels at 60 footcandles to determine differences in longevity of pollen-less (PL) and pollen-producing (PP) varieties. Although some pollen-less varieties, Full Sun and Sunbright, demonstrated greater longevity than

pollen-producing cultivars, Valentine (PP) had greater longevity than Claret (PL) and Joker (PL).

### Guidelines for Growers

These results provide guidelines for the spring growing season along the Gulf Coast. These guidelines can be used to assist growers in planning market dates through crop scheduling. Climatic changes caused by fluctuations in temperatures, rainfall and solar radiation, however, may affect stages of development and thus total days to harvest. ■

### Acknowledgments

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*Zinnias were included in this study of production schedules for the specialty cut flower industry.*

Courtesy of All-America Selections



2003-2004

# Bedding Plants and

Allen D. Owings

Gordon E. Holcomb



Marigolds

Photo by Allen Owings

The LSU AgCenter has been conducting landscape performance trials on many annual bedding plants and non-woody perennials over the past 10 years. These trials are now at the new Ornamental and Turfgrass Research and Extension Facility at Burden Center in Baton Rouge. Efforts in 2003 and 2004 included evaluation of cannas, coleus, angelonias, purslane, lantanas, perennial verbenas, annual and perennial salvia, vinca, zinnias, melampodium, petunias, rudbeckia, phlox, daylilies, dianthus, ornamental kale, ornamental cabbage, calendula, violas, pansies, ornamental sweet potatoes, garden mums, African and French marigolds and others.

Brief summaries of selected evaluations follow.

## Lantanas

The standout performers among new lantanas is the Son series from Jim Covington at Clinton Nursery in Clinton, Miss. The Son series includes Sonrise, Sonset, Samson and Sonshine. Sonrise was the first release in the series and was a Mississippi Medallion winner in 2003. Sonrise has golden yellow flower clusters that change into rosy pink or reddish orange and then finish magenta. Sonset is a mutation of Sonrise and has deeper vibrant red and purple blooms. Both of these varieties reach spreads and heights of 4 to 5 feet and have good cold hardiness. Samson is lower-growing and more spreading and has gold and orange flowers. The newest Son series lantana is Sonshine, which has two-toned yellow and light yellow flowers on plants reaching heights of 3 feet with a spread of 5 feet.

The Morning Glow series from Bodger Botanicals and Patriot series from American Daylily and Perennials



also have been evaluated over the past couple years. The Morning Glow series is an upright grower with good vigor and flowering but lacks the cold hardiness of some other varieties. Most varieties in the Patriot series are average to slightly above-average performers.

## Athens Select plants

One plant group gaining recognition in the Gulf States is the Athens Select program, which was founded in 1999 as the result of plant evaluation efforts at the University of Georgia. Athens Select plants have been evaluated at the AgCenter. These plants are promoted as "heat and humidity" tested. Louisiana has much more heat and humidity than Georgia, and the majority of the Athens Select plants are doing well in AgCenter landscape plant evaluations.

## Perennial verbenas

Interest continues in perennial verbenas, and the Princess series was the top performer in AgCenter trials in 2003 and 2004. Varieties in the series include Princess Dark Lavender, Princess Dark Rose, Princess Blush and Princess Blue, also known as Biloxi Blue. Longevity in the landscape, extended bloom time and



Zinnias

Photo by Mark Claessens



Cannas

Photo by Allen Owings

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# LANDSCAPE PERFORMANCE and Herbaceous Perennials

Anthony L. Witcher

C. Allen Broyles



Vinca

Photo by John Wozniak

fewer foliar disease problems were characteristic of this series when compared to several others evaluated. The Aztec series from Ball FloraPlant is also worthy of use in Louisiana.

## New colors in Profusion zinnias

The Profusion series of zinnias has been around for about five years and includes some colors that have been All-America Selection winners. Orange, white and cherry were the first three colors released in the series, with Profusion Orange being the most reliable of the three. New in 2004 were Profusion Fire and Profusion Apricot. These performed well and would be comparable to Profusion Orange in vigor and flowering. The Profusion zinnias were affected by bacterial petal blight in 2004.

## Dianthus

The newest dianthus worthy of mentioning is the Amazon series. These are prolific flower producers and should be planted in September, October or November. Plantings will last until mid-May in the Baton Rouge area. Colors

available in the Amazon series are Rose Magic, Purple, Cherry and Neon Duo. Amazon dianthus are hybrids from Pan American Seed.

## Vinca

The Victory series of vinca from Sakata Seed and the new Titan series of vinca from Pan American Seed are the two main newer vinca included in AgCenter trials the past year. Titans have larger flowers when growing in cell-packs in the greenhouse, but flower size has not necessarily held up in the landscape. *Choanephora* flower spot blight appeared in the fall of 2004. We normally avoid typical root rot and blight problems on vinca by planting late in the spring (early May), maintaining an acid soil pH, practicing sanitation in the landscape bed and managing irrigation.

## Sun and shade coleus

Just when we thought new coleus would no longer be introduced, along came the Kong series in 2004. These coleus plants look like sun coleus with their big, vibrant foliage but need partial shade to full shade for the best landscape performance. Kong coleus are available in rose, mosaic, red and scarlet. The Solar series is still a great sun-loving coleus group. Also, New Orleans Red is a Louisiana Select winner and Mississippi Summer Sun (Razzle Dazzle) is a Mississippi Medalion winner. The Aurora series of coleus from Ball Flora Plant includes Aurora Black Cherry, a terrific performer.

## Marigolds

Spring and fall plantings of African and French marigolds have been studied the past few years. Most people now say that a mid- to late-summer planting of marigolds will out-perform a spring planting of marigolds. The large-growing, bigger-flowered African marigold plants are not as reliable as the smaller-growing, smaller-flowered French marigold plants. In 2004, *Choanephora* flower blight was the main disease observed on marigolds and was much more prevalent on the African marigold varieties. ■

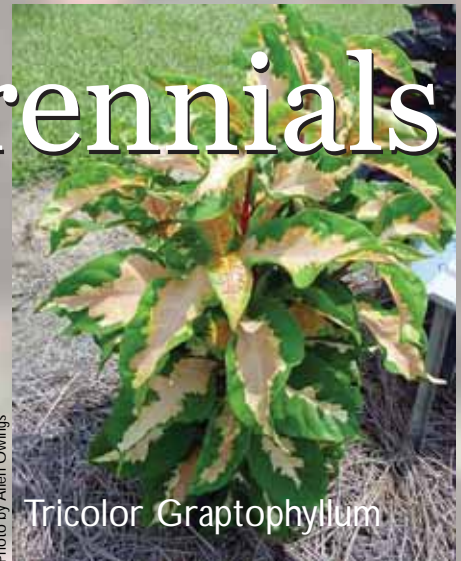


Photo by Allen Owings

Tricolor Graptophyllum



Photo by Mark Claesgens

Lantanas



Photo by Allen Owings

Dianthus



## Above-ground Systems

The mid 1990s saw the introduction of above-ground pot-in-pot production systems – also referred to as “nested containers” – with 7- and 15-gallon containers most common. This method is intended to overcome some of the disadvantages associated with in-ground pot-in-pot while still taking advantage of the insulation value of a socket container. The above-ground system places a potted container in a socket pot on the surface of a container yard, ground cover-clothed area or field. The socket pot has flared sides to prevent blow-over and only needs a little soil or mulch at the base to be held in place.

Compared to in-ground pot-in-pot systems, above-ground pot-in-pot systems provide significant labor and cost savings at installation. They also allow for adjustments in container spacings and eliminate the need for ideally drained soils or installed drainage systems.

Escape roots can sometimes be a problem with in-ground pot-in-pot plants, whereas escape roots are normally less of a problem in the above-ground system.

Blow-over may occur once in a while with above-ground pot-in-pot systems; it never occurs with in-ground pot-in-pot, if the socket pots are properly installed. Both of these methods will save significant labor picking up blown-over plants. Retail garden centers and wholesale yards should consider an above-ground pot-in-pot system for short-term holding of large trees and shrubs that are prone to blow-over.

Studies comparing root-zone temperatures and size of the root mass usually show that a plant properly maintained under an in-ground pot-in-pot production method will have minimal root-zone temperature fluctuations and increased root growth compared to an above-ground pot-in-pot system. The insulation capability of the above-ground pot-in-pot system is considerably less than the in-ground pot-in-pot system, but the above-ground method has been shown in some instances to effectively reduce the amount of root stress on the southwest side of containers when compared to traditional container growing. More research is needed to further investigate these issues. ■

Allen D. Owings

**T**raditional pot-in-pot production in a nursery attempts to combine field and container growing techniques and offers advantages over both production systems. A “socket” container is placed in the ground and a second pot containing the growing plant is placed into the socket.

Advantages of pot-in-pot production when compared to traditional container production include reduced irrigation requirements, reduced heat stress to the root system during the summer, elimination of container blow-over and minimization of root-zone temperature fluctuations during the winter months.

Growers across the Southeast have been implementing pot-in-pot nursery production systems to a varying degree for the past 10 to 15 years. The practice has gained wide use in some areas more than others. Pot-in-pot is normally used in shade tree production, but shrubs can also be grown successfully using this system.

## In-ground Systems

In-ground pot-in-pot production has been shown to produce a larger plant root mass when compared to conventional container production. A larger root mass translates into improved transplant success and faster establishment in the landscape.

A primary requirement for an in-ground pot-in-pot system is a well-drained soil base or an installed drainage system to remove excess rainfall or irrigation water on poorly drained soils. Normally, a sandy soil, or most certainly a soil no finer textured than a sandy loam or silty loam, is needed if drainage improvements are not made. Additionally, installing an in-ground pot-in-pot system is labor intensive and requires considerable equipment. The system also is permanent once installed, so future production plans and nursery layouts need to be carefully considered before installation.

# Nursery Engineering

Richard L. Parish

Photos by Richard L. Parish

Raising plants in containers creates unique problems for nursery growers. A series of tests were undertaken to help assess the benefits of different growing techniques.

## Plant Blow-over

Blow-over of plants is a major problem for container nurseries. This is especially true with container-grown trees because they are tall and targets for wind. Blow-over causes:

- Increased labor costs setting the trees back upright
- Damage to trees, reducing their value
- Loss of granular fertilizer
- Drying out of trees not watered properly while down

Nursery growers have tried several methods including guy wires on individual trees, trellis wires down the row and stakes driven through or beside containers. Also, some nursery supply companies have developed devices to stabilize plants and containers.

A test of systems to prevent or reduce blow-down of trees in 15-gallon containers included eight treatments, each with loblolly pine, bald cypress and Nutall oak. Treatments included the nursery standard of one steel rod (or stake) driven through the pot into the ground, two types of wire basket supports (two with and one without staking), plastic pot-in-pot supports (with and without staking), a trellis system with straps, and individual stakes (steel fence posts) with plastic supports.

Labor and material costs ranged from 33 cents per container for the standard steel rod to \$11.29 per container for the trellis system. However, the components of most of the systems can be reused for several years with little or no additional labor cost.

The first problem noted in the 15-gallon test was partial collapse of the plastic pot-in-pot supports with and without stakes and with all three types of trees. Nevertheless, there



The first problem noted in the 15-gallon test was partial collapse of the plastic pot-in-pot supports with and without stakes and with all three types of trees.

was not enough damage to the inner containers to affect sale, and the outer containers were judged to be reusable.

A “reset ratio” is determined by dividing total trees blown over and reset during the season by the number of trees in the treatment. The higher the reset ratio, the higher the resulting labor cost. Considering the annualized cost of the various treatments and the cost of resetting as provided by the cooperating nursery, the annual cost per tree per treatment ranged from 12 cents for Nutall oak with the standard stake to \$1.63 for bald cypress with a staked basket.

A second test at the same nursery used pond cypress and live oak trees in four-gallon pots. One treatment used a horizontal rod on top of a 20-foot row of pots held down by steel hooks driven into the ground. The second treatment was the standard steel rod driven through each container. For both treatments, two outer rows were staked and three rows were not restrained. Data on number of blown-over trees were collected throughout the season.

Table 1 shows the reset ratios for the test of horizontal rods in four-gallon containers. The data show that the horizontal rod treatment was less effective than the standard vertical rod. The problem with the horizontal rods appeared to be an inadequate number of hooks holding the horizontal rods down. In the vertical rod treatment, each container had vertical rods whereas the horizontal rods were anchored with hooks every four containers. Under strong winds, the hooks pulled loose.

Table 1. Blow-over data for 4-gallon container tests

Treatment	Reset ratio for pond cypress	Reset ratio for live oak	Overall reset ratio
Horizontal rods	2.42	2.31	2.37
Vertical rods	1.38	1.66	1.52



One treatment in this study was wire baskets with stakes. This research was conducted by the LSU AgCenter's Hammond Research Station at a local nursery in Tangipahoa Parish.

Richard L. Parish, Professor, Hammond Research Station, Hammond, La.



The horizontal rods were anchored with hooks every four containers.

## Granular Herbicide Application

Controlling weeds in the containers of ornamental plants often involves applying granular herbicides with a hand-held rotary broadcast spreader. Losses from such applications can be significant. This study compared losses from rotary broadcast, drop and band spreaders using three container spacing configurations and five species of plants.

Clay granules (a common pesticide carrier) were used for this experiment. Plant species used were liriopie, prostrate juniper, monkey grass, azalea and dwarf gardenia. These species represent a wide range of plant canopy openness. All of the plants were in one-gallon nursery containers.

Three container configurations were evaluated:

- Containers were placed rim-to-rim in a hexagonal pattern with a straight line of containers in the direction of spreader travel.
- Containers were placed rim-to-rim in a square pattern.
- Containers were placed in a square pattern on 12-inch centers in each direction.

The first part of the study used a hand-cranked rotary applicator with two plant species – monkey grass and azalea. The containers were arranged in beds approximately 6 feet wide. Granules that missed the containers were caught on strips of polyethylene film under the containers and on test strips without containers. The spreader was operated on each side of the beds of plant containers. The test was replicated four times.



This is a Tree-Mate-O clamp on a T-post.

A special fixture built to test the drop-type spreader used an elevated wooden track over a wire mesh table on which the plants were placed. A sheet of polyethylene film on the floor under the wire mesh collected granular material that missed the containers. Each species of plant was placed on the wire mesh in each of the three configurations, and material that missed was collected and measured. Each test was replicated four times. After these trials were completed, the spreader was modified to disperse the material in bands over the containers. Only configuration 3 was used for this series of tests.

Losses with a rotary spreader – 37 percent with configuration 1 and 87 percent with configuration 3 – were higher than with a drop-type spreader – 13 percent with configuration 1 and 76 percent with configuration 3.

When the drop-type spreader was modified for banding, losses were reduced to a rate of 48 percent to 70 percent compared with 72 percent to 86 percent before modification. Plant species and container spacing configuration had significant effects on material loss. Drop spreader losses ranged from a low of 10 percent with closely spaced juniper to 86 percent with widely spaced liriopie. With a rim-to-rim hexagonal configuration, the losses varied from 10 percent with juniper to 20 percent with liriopie. With a rim-to-rim square configuration, the losses varied from 15 percent with azalea to 31 percent with liriopie. With configuration 3, the losses were higher, ranging from 72 percent to 86 percent. Application efficiency was better with close-spaced plants.

Application efficiency improved with a more-controlled application pattern. Material was still lost between the containers in a line parallel to the direction of travel, but losses between containers perpendicular to the line of travel were greatly reduced in most cases.

This study demonstrates the extremely low application efficiency of rotary broadcast application on widely spaced plant containers. The losses in that case were as high as 87 percent of the granular material applied. Using tight container spacing reduced the losses with a rotary spreader to 37 percent. Using a drop-type spreader somewhat reduced the losses with widely spaced containers to a range of 72 percent to 86 percent and reduced the losses with tight container spacing to 10 percent to 20 percent. Modifying a drop spreader to apply discrete bands further reduced losses with the widely-spaced containers to 48 percent to 75 percent.

Efficacy of granular material application under typical nursery conditions can be quite poor. This study demonstrates that it is possible to significantly improve that efficiency by using different but commercially available application equipment. We suggest nurseries consider using drop-type spreaders rather than rotary spreaders for applying granular materials. Large, high-clearance drop spreaders are commercially available in widths up to 12 feet. Using such a spreader in a broadcast mode for closely spaced containers and modifying it to band on widely spaced containers would significantly improve the efficiency of granular herbicide application. This improvement in application efficiency would reduce costs and reduce environmental contamination from lost herbicide. ■

### Acknowledgment

Wayne C. Porter, Area Extension Agent, Mississippi Cooperative Extension Service, and formerly at the Hammond Research Station, contributed to the granular herbicide application research.

# Weeds in Container Nursery Crops

Ron Strahan

Weeds compete with nursery crops for water, nutrients and light and can potentially harbor insects and diseases. They are common in all container nurseries and can cause significant losses in product quality and quantity. Effective and economical weed control in nursery crops involves the ability to identify weeds correctly so weed problems can be remedied. The most troublesome are those difficult to manage because of heavy seed production, unique mechanisms of seed dispersal, and lack of sufficient control methods.

Although weed problems vary at nurseries, the following weeds cause the most problems in container nursery crops in Louisiana.

**Bittercress**, a member of the mustard family, is considered the most problematic weed in container nursery production in Louisiana. In the wild, bittercress behaves as a winter annual, but it germinates year-round in optimal growing conditions found at nurseries. The plant can produce as many as 5,000

seeds and can expel mature seeds two to three feet. Seed are extremely viable and can germinate immediately when growing conditions are favorable. Bittercress matures quickly and is capable of producing seed 4 weeks after germination.

**Spurges**, members of the poinsettia family, are prolific seed-producing annuals that thrive in hot weather. Under optimum growing conditions, plants can go from seed to flower in only three weeks. Some spurges have a more-prostrate growth habit, which can form dense mats. Other spurge species grow more upright. Several different species of spurges are common in container nurseries including prostrate spurge, spotted spurge and garden spurge.

Broken spurge stems emit a milky latex that can be helpful in distinguishing this plant from other species. The

plants are difficult to manage in container nurseries because of heavy seed production and the difficulty of removing them by hand. Plants often break at the stem during this process, leaving the root and several buds or a single stem available for potential reestablishment.

**Woodsorrel** is a perennial weed that produces numerous creeping above- and below-ground stems and deep tap-roots that make hand removal difficult. The plants are heavy seed producers and possess an efficient method of seed distribution. At maturity "okra-shaped" seedpods burst open and expel seed 10 to 12 feet in all directions. Woodsorrel

Photo by Ron Strahan



*Bittercress germinates year-round in the optimal conditions found in nurseries.*

Photo by Ron Strahan



*Bittercress flowers.*

Photo by Ron Strahan



*Some spurges have a more prostrate growth habit, which can form dense mats.*

Photo by Mark Claesgens



*Spurge flowers.*

Photo by Mark Claesgens



*Woodsorrel are heavy seed producers and possess an efficient method of seed distribution.*

Photo by Ron Strahan



*Yellow woodsorrel grows more upright and produces below-ground stems.*

*Ron Strahan, Assistant Professor, Department of Agronomy & Environmental Management, LSU AgCenter, Baton Rouge, La.*

has three heart-shaped leaf components that vary in color from dark green to reddish purple. Two species of wood-sorrel are common in container nurseries in Louisiana. Creeping woodsorrel has a prostrate growth habit and produces numerous above ground-stems; yellow woodsorrel grows more upright and produces below-ground stems.

**Chamberbitter and long-stalked phyllanthus** are extremely invasive summer annuals. Populations of these two plants have increased significantly since their introduction from Asia because of their prolific seed production and tolerance to most preemergence herbicides labeled for use in ornamentals. Both plants resemble hemp sesbania or mimosa seedlings. However, the most distinguishing characteristic of the two species is the round seed capsules located on the underside of slender branches. Chamberbitter is a stout, more-branched plant with seed capsules borne in the axils of leaves. Longstalked phyllanthus is an erect, slender plant with seed capsules attached to stalks.

**Mulberry weed**, native to Asia, is an upright summer annual. The plant has an upright growth habit and can grow to a height of 3 to 4 feet. Leaves are triangular-shaped, serrated and prominently veined. Plants resemble seedling

mulberry; however, mulberry weed has hairy leaves and stems and is non-woody. Mulberry weed has unique feathery flowers that first appear purplish and then brown as they mature. Plants are prolific seed producers and can forcefully expel seed up to 4 feet.

The weed develops quickly, can go from seed to flower in less than two weeks and can produce several generations in one growing season. Mulberry weed is invasive and continues to spread throughout container nurseries in Louisiana.

Managing troublesome weeds in container nurseries is a difficult and expensive task. Therefore, preventing weed establishment is essential to reduce weed populations and lower production cost. Effective weed management begins with sanitation, which is extremely important for reducing the opportunity for weed seed contamination in nursery crops. This includes controlling weeds in noncrop areas around the nursery and in gravel or fabric areas where container crops are placed. Weed seeds also adhere to soil on the outside of pots, the pots should be washed before being reused.

Preemergence herbicides are an important tool to aid in the management of troublesome weeds. They work by forming a chemical barrier in the upper one-half to one inch of the potting medium where most seeds are germinating; however, timing is critical for success. Herbicides must be applied before weed emergence. Failure to apply preemergence herbicides in container crops before weeds emerge will usually limit growers to costly hand removal. ■

Photo by Ron Strahan



Mulberry weed has an upright growth habit.

Photo by Mark Claesgens



Mulberry weed has unique feathery flowers that first appear purplish and then brown.

Photo by Mark Claesgens



Long-stalked phyllanthus are extremely invasive summer annuals.

Photo by Mark Claesgens



A distinguishing characteristic of long-stalked phyllanthus is the round seed capsule.

**Suggested preemergence herbicide options for the five most troublesome weeds of container nurseries.**

Weed	Herbicide	Remarks
Bittercress/rockcress	flumioxazin, isoxaben, oxadiazon, oxyfluorfen	Control is difficult due to periodic germination throughout the year. Scout nurseries often. Sanitation is essential for management. Consult label for tolerant crops.
Spurge	flumioxazin, isoxaben, oryzalin, oxadiazon, oxyfluorfen, pendimethalin, proflaminate	Preemergence control is essential because hand removal is often unsuccessful. Consult label for tolerant crops.
Woodsorrel	flumioxazin, isoxaben, oxadiazon, oxyfluorfen	Combination of preemergence herbicides and hand removal necessary for complete control
Chamberbitter and long-stalked phyllanthus	isoxaben, proflaminate, oxadiazon	Preemergence herbicides have been inconsistent on these phyllanthus species.
Mulberry weed	isoxaben, proflaminate	Very invasive annual. Sanitation is very important to reduce contamination of production area.





# Terrific Turfgrass for Louisiana

Photo by John Wozniak

David J. Lee and Thomas J. Koske

From Saturday night in Tiger Stadium to golf courses, home lawns, cemeteries, sod farms, roadsides and parks, turfgrasses provide functional, economic, recreational, health and safety, environmental and aesthetic benefits to Louisiana.

Turfgrasses are of two types: cool season and warm season. Cool-season grasses, such as tall fescue, Kentucky bluegrass, creeping bentgrass, perennial ryegrass and annual ryegrass, are not adapted to Louisiana. Therefore, their uses should be short-term and limited. Warm-season grasses, such as bermudagrass, zoysiagrass, centipedegrass, St. Augustinegrass and seashore paspalum, can all be viable choices for permanent turf in Louisiana. Selection of the proper species of turfgrass for each location and use is critical for the long-term sustainability of the turf. The LSU AgCenter has been conducting adaptation research on some of these species for 30 years.

To select the appropriate turfgrass, one must answer these questions:

**What is the intended use of the turf area?** Some grasses have a utilitarian purpose, such as true ball roll on a golf green, sustainability or wear tolerance; some just look good.

**What is the level of maintenance (money and time)?** Turfgrass should be selected according to the amount of resources one is willing to invest.

**What are the physical and environmental limitations?** Sunlight, water quantity, water quality, soil pH, soil type and internal soil drainage are important factors when selecting different varieties.

Based on LSU AgCenter research results, turfgrass specialists have arrived at the following descriptions of how different grasses can be expected to behave in Louisiana. See Table 1.

## Bermudagrass

Bermudagrasses, also called wiregrass or couchgrass, are planted in almost every turf setting across Louisiana. Bermudagrass is ideal on athletic fields and golf courses with

adequate maintenance budgets. Many different types of bermudagrass are available for Louisiana, ranging from common bermudagrass that is well-suited for uses such as lawns, utility areas and lower-input athletic fields, to the “ultra dwarf” bermudagrasses that require extremely high maintenance for use on top-quality golf course putting greens.

Traditionally, hybrid bermudagrasses have provided the highest quality turf areas and are used in high-maintenance areas, such as golf courses and athletic stadiums. Bermudagrass hybrids must be established vegetatively through sodding, plugs or sprigs. Recently, researchers at the AgCenter and other institutions across the Southeast have been evaluating improved seeded

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*David J. Lee, Assistant Professor, and Thomas J. Koske, Professor, Department of Horticulture, LSU AgCenter, Baton Rouge, La.*

Table 1. Characteristics of Warm-Season Turfgrasses Recommended for Use in Louisiana.

Condition	TURFGRASS SPECIES				
	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass	Seashore Paspalum
Mowing Height (in.)	½ - 1 ½	1 ½ - 2	2 - 4	1 - 2	½- 2
Drought Tolerance	Excellent	Fair	Good	Good	Excellent
Shade Tolerance	Very Poor	Fair	Good	Good	Poor
Wear Tolerance	Excellent	Poor	Poor	Excellent	Excellent
Recuperative Capacity	Excellent	Poor	Good	Poor	Good
Fertility Requirements	High	Low	Moderate	Moderate	Moderate
Maintenance Level	High	Low	Moderate	High	High
Establishment Method	Sod, Sprigs Seed, Plugs	Seed, Sprigs Plugs, Sod	Sod, Sprigs, Plugs	Sod, Plugs, Seed	Sod, Plugs, Sprigs

varieties. The varieties Princess, Savannah, Yukon, Sydney, Sultan, Southern Star and Riviera have performed close to the hybrid standard – Tifway 419 – in these trials.

### Centipedegrass

Centipedegrass is a well-adapted, apple-green, medium-textured grass. It does well in acid soil (pH 5.2 to 5.8), has a low fertility requirement and grows slowly, giving it the name “lazy man’s grass.” Centipedegrass is popular for Louisiana lawns and areas that receive lower maintenance and traffic. Overfertilization of centipedegrass can result in excessive thatch buildup, iron chlorosis and an overall dieback referred to as “centipedegrass decline.”

A limited number of improved varieties, such as Oaklawn, Centennial (dwarf) and TifBlair, have been selected primarily for improved cold hardiness. Centipedegrass can be established from either seed or vegetatively. However, with its delicate seeds, seeding is preferred only on larger acreage.

### St. Augustinegrass

St. Augustinegrass, also known as Charlestongrass, is well-adapted to Louisiana. It produces a coarse-textured turf with dark- to blue-green foliage and establishes fairly quickly and easily from plugs. St. Augustinegrass is also a popular choice for home lawns. St. Augustine has more pest problems than other grasses. St. Augustine decline (SAD) has been a major virus problem, along with brown patch disease and chinch bugs.

Several improved varieties of St. Augustinegrass are available on the market. They include Raleigh, Seville, Bitterblue, Floratam, Palmetto and Floratine. The LSU AgCenter is currently evaluating new varieties for suitability in Louisiana.

### Zoysiagrass

Zoysiagrass can be one of the most beautiful lawn grasses in the South. Unfortunately, these grasses require a high level of maintenance and are rarely found in Louisiana landscapes. Once established, they form a dense, uniform sward of grass that is second to none. These grasses turn tan through winter. Their slow growth negatively affects establishment and recovery from wear. They are sensitive to compacted soils. The most effective way to establish a zoysiagrass turf is by sodding. Zoysiagrass can also be established through sprigs and plugs, and some varieties can be started with seed. However, these could take two growing seasons to establish and require additional materials to control weeds.

Several species and varieties can be used. The varieties vary widely in color, texture and establishment rate. *Zoysia japonica*, commonly called Japanese or Korean lawngrass, has a medium texture, good color, excellent cold tolerance and a faster establishment rate. Common varieties include Meyer Z52, JaMur, Belair Cavalier, Crowne, El Toro and Empire. Most of the commercially available seeded varieties like Zenith are *Z. japonica*.

*Zoysia matrella*, or Manilagrass,

University Club golf course in Baton Rouge, La.



produces a slightly finer, shade-tolerant lawn than the japonicas but is less cold hardy.

*Zoysia tenuifolia*, or Mascarene-grass, is the finest-textured Zoysiagrass. It is the least cold-tolerant of the genus and produces excessive thatch. Emerald is a hybrid between *Z. japonica* and *Z. tenuifolia* and displays the traits of a faster growth rate, some cold hardiness and the color of *Z. japonica* with the fine texture, shade tolerance and density of the *Z. tenuifolia*.

Zoysias are highly recommended for top-quality, high-maintenance turf.

### Seashore paspalum

Seashore paspalum, also called knotgrass or saltwater couch grass, is a relatively new grass used in coastal

areas that face water quality issues. These grasses are adapted to saline environments and can withstand salinity levels up to ocean water salt levels (34,000 ppm). In these high-saline environments, turf quality and performance of the seashore paspalums exceed bermudagrass.

Limitations of seashore paspalum include poor shade tolerance and limited cold tolerance. They require non-saline water for establishment, sandy soils and complex irrigation programs. Heavy thatch potential, limited chemical pest control options and the relatively unknown long-term effects of different agronomic practices make seashore paspalum prime research material. Seashore paspalum is mostly propagated vegetatively and has been used on golf

courses and athletic fields. New releases are Sea-Green (putting greens), Sea Isle I (tees), SeaDwarf (greens), SeaWay (fairways) and Neptune Salam (fairways). Seashore paspalum is a “niche” grass that has potential to provide high-quality turf under proper environmental, management and soil conditions in areas south of the I-10 corridor.

Turfgrass selection is critical to the sustainability of a turf area. It is essential that growers realize that the selection process begins with recognizing varieties adapted to a particular region and understanding the limitations of each. They can then determine the characteristics most important and necessary for their use to ensure success. ■

Photo by John Wozniak



# Getting Rid of Plant Pests in Nurseries

Photos by Dale Pollet

Dale Pollet

The LSU AgCenter offers help to nursery owners in their continual battle against pests, especially insect pests. One recent confounding factor is the mosquito. Efforts to control mosquitoes because of the threat of West Nile virus have inadvertently increased some pest problems for nurseries and homeowners. That's because the insecticides (pyrethroids) used for control of these mosquitoes also reduce the numbers of predators and parasites that feed on such plant pests as scales, aphids and whiteflies. Additional pests in nurseries include the Asian ambrosia beetle and the red imported fire ant.

## Scales

Scales are the largest group of insects representing some 31 families, 16 of which are found in Louisiana. This diverse group can infest all parts of the plant or turf system, from the roots to the foliage.

These piercing, sucking insects feed on plant tissues and in many cases, as with aphids and whiteflies,



excrete vast amounts of honeydew. This sticky substance acts as a medium for the development of sooty mold, which reduces photosynthesis. Also, bees, wasps and ants feed on the honeydew.

Many scale populations infesting the plant and turf industry go undetected until some irregularity or injury on the plant becomes visible. Population density and the protective covers and waxes secreted by the scales make them blend in with some plant systems. In addition, scales like the white peach scale, San

Jose scale, ground pearls and the cottony cushion scale inject toxins into the system as they feed, killing the plant. Pit scales can clog plant tissues and kill the plants by restricting nutrient and water movement. Identification is critical to effective control.

## Aphids

Aphids are a large complex of insects that damage either a broad spectrum of plant material or a specific host. Aphids have piercing, sucking mouthparts and, like scales, feed on all parts of the host. They also excrete honeydew, which can lead to sooty mold build-up. They also are potential vectors of plant diseases. Management of aphid populations can be difficult due to the varied and complex life cycles of some species.



## Whiteflies

Whiteflies are a management nightmare for nurseries. Populations can easily hide in the planting system, like scales, and can be dense and damaging before detection. Like scales and aphids, whiteflies feed through piercing, sucking mouthparts and excrete large amounts of honeydew. They also transmit diseases. The immature forms look very much like scales feeding on the underside of the plant foliage. There are 19 recorded species from Louisiana, although not all are ornamental pests.

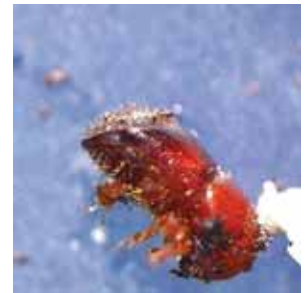


The newest introduction is the giant whitefly, which is about twice the size of other whiteflies. The giant whitefly

has been found on canna lilies and ginger. It produces large amounts of wax that coat the foliage and another wax that hangs down from the leaves like long shiny wax threads some six inches or longer.

## Asian Ambrosia Beetle

The Asian ambrosia beetle was a serious pest in nurseries in 2004. This beetle attacks live trees rather than stressed trees. It initially bores into the trees and extrudes an ash-like mass of chewed wood. The beetle, though, does not kill the trees. It's the fungus carried by the beetle that eats the wood, and the adults and larva feed on the fungus. This is typical of many of the bark beetles. Because it does not attack all types of trees, it is imperative that nursery owners check trees. And when the first signs of an infestation are noted, remove the infested trees and destroy them as a preventative, while treating surrounding trees.



## Fire Ants

Fire ants affect nurseries by damaging the roots of plants and causing a nuisance with their stings. Management is critical for shipping. Fire ants are part of the Louisiana Department of Agriculture and Forestry's quarantine program. New management systems using insect growth regulators (IGR) or a combination of IGRs and insecticide baits should help to reduce cost of fire ant management. Programs are being



Dale Pollet, Professor and Extension Specialist, Department of Entomology, LSU AgCenter, Baton Rouge, La.

tested to evaluate the use of these materials similar to the community wide programs for subdivisions.

## Pest Management

Management of pest populations is based on three components: identification of the pest, an effective management material to apply and proper timing of application. In many cases the volume of water used to apply insecticides is critical. This affects coverage on the plant so proper contact with the pest is achieved. The larger the plant, the more water required. Plants that have a waxy or hairy leaf surface or where the pest is wax-covered require the addition of a spreader sticker to increase the pests' contact with the management tool.

Water pH is another potential problem for growers. Insecticides are acid-forming materials, and many water systems are basic (alkaline) with the state average at 8.3-8.4 (range of 4.3 to 12). When mixed with insecticides for spraying, this basic water causes a process known as alkaline hydrolysis, which breaks down the insecticide, thus reducing its effectiveness. Repeated applications for control become necessary, and this causes the potential for the development of tolerance or resistance to the insecticide. The use of buffers to reduce the water pH to the optimum range of 5.5 to 6.5 will allow the insecticide to work more efficiently. The use of ultra fine oils in many instances will enhance the effectiveness of the insecticide. In some cases, especially against mites, these oils are an effective management tool alone.

Timing is the most critical factor for optimum control. By knowing the identification of the pest and thus its life cycle, then control measures can be properly timed at the most susceptible stages. This will help to make the management programs environmentally safer, economical and effective. ■

Go to "Lawn & Gardens" at [www.lsuagcenter.com](http://www.lsuagcenter.com) for information on how to control pests in nurseries. You may also order the publication, "Pest Management Guide."

# Horticulture in a Can:

## Improving Student Grades and Attitudes Toward the Environment

Kathryn L. Karsh, Edward W. Bush, Pamela B. Blanchard and Janice M. Hinson

As a way to bring awareness to Louisiana's vanishing coast, the Department of Horticulture in cooperation with the Louisiana Sea Grant College developed an educational program called "Coastal Roots" aimed at elementary and secondary students. These young people learn to grow coastal plants and then place them in the wetlands to help prevent erosion. Another goal of the program is to provide wetland plant and habitat educational materials to teachers and students. The lessons are designed to not only teach about wetland plants but also the horticulture biology behind how wetland plants grow. Lesson topics include plant identification, wetland habitats, photosynthesis, composting, pollination, genetics, wetland soils and global warming.

For the past two years (2003-2004), the lessons, dubbed "Horticulture in a Can," were taught in four middle schools in South Louisiana – Pierre Part, Montegut, St. Louis King of France in Baton Rouge and St. James Math and Science Academy in Vacherie. One treatment class and one control class were chosen at each school. Before the lessons were taught, pre-tests were given on horticulture and also on children's attitudes toward the environment. The lessons proved successful both years, both for horticulture knowledge and attitudes toward the environment. ■

Kathryn L. Karsh, Graduate Student, and Edward W. Bush, Associate Professor, Department of Horticulture; Pamela B. Blanchard, Assistant Professor, and Janice M. Hinson, Associate Professor, LSU College of Education.

Photos by Kathryn L. Karsh



St. Louis King of France student records temperatures.



Students learn about xylem and phloem transport using oak dowels and bubbles at St. Louis King of France.



St. Louis King of France students study plant genetics.



Montegut Middle School students count plant hairs to study phenotypes.

# New Light Shed on Landscape Groundcovers

Catherine Broussard, Edward W. Bush and Ann Gray

The best choice for shady areas where light is a limiting factor in turfgrass growth is a groundcover. Typical lawn grasses are physiologically incapable of surviving such locations. It is better to choose a groundcover adapted to shade than try to get grass to grow. In a deep shade environment no amount of fertilizing or watering can replace sunlight.

A groundcover is a reasonably low-growing, attractive, ideally evergreen plant used in place of grass, rocks, pebbles, organically derived mulching materials or earth in an area that might otherwise be devoid of vegetation. In the landscape, groundcovers can add visual interest by softening architectural features, adding foliage and flower color, height and textural patterns, and edging walks or ornamental beds. Continuity is provided in the landscapes by tying together mature plant specimens with new additions or bridging a garden's formality with informal aspects.

Practically, groundcovers can be used to reduce erosion on steep or difficult slopes, and they function as living mulch under trees and shrubs. They also work to guide onlookers through the landscape.

Groundcovers do not require the intense maintenance that lawns require, so time is saved on mowing, raking, edging, weeding, watering, feeding, liming, and insect and disease control. Lawn-maintenance chemicals are not required, so harmful runoff from rainfall or irrigation is reduced. Groundcovers moderate soil temperature and reduce water loss by reducing evaporation, allowing water percolation. These plants have greater tolerance to insects and disease than lawns.

Two of the most reliable and widely used groundcovers in Louisiana are liriopie and mondograss (monkey grass). Collectively, these are also referred to as border grass. These groundcovers are known for their versatility in the landscape and thrive in many degrees of sun and shade.

Liriopie and mondograss are originally native to Eastern Asia and were introduced to the West 200 years ago. They are generally known to perform best in moist fertile soils in partial shade but actually tolerate dry, poor and thin soils in sunny or shady sites. They are propagated primarily by division and infrequently by seed.

Though insects cause minimal problems, scale has been noticed to be a problem on some varieties. However, this can be controlled by pruning the foliage in the late fall or early winter. In the past few years, a crown rot disease has led to significant losses of various liriopie and mondograss varieties in the landscape and nursery production settings. Several fungi and certain environmental and cultural conditions can cause leaf and crown rot of liriopie. In some varieties leaf discoloration at the tips and red leaf spots associated with rust also are found at various times of the year.

Because of their versatility and reliability, liriopie and mondograss have become as much of a Southern tradition in the landscape as azaleas, magnolias and crape myrtles. Liriopie grows as a mass of varying shades of green or variegated leaves similar in appearance to grass and is used as a ground cover, a border, an interesting specimen in the landscape or even as a container plant.

Liriopie flowers grow on stalks from the crown through the middle of the foliage. This is the striking feature of liriopie. Depending on variety, the color can be white, lilac, pink or purple.

Mondograss is a mass of thin dark green leaves that resemble grass. The white flowers bloom in May but are inconspicuous on short stalks hidden within the leaves. Once established, mondograss multiplies rapidly, out-competing weeds and other vegetation.

Because of the numerous varieties of liriopie and mondograss (dwarf, black, variegated), the various settings for which they can be used, and consumer preferences for varying foliage and flower characteristics, LSU AgCenter scientists conducted an experiment at Burden Center. The three-year study consisted of 19 varieties and two treatments, one with sun and the other with shade and was replicated six times.

Following is the list of the ten plants of the 19 studied. Big Blue is the only one that did better in the sun than the shade.

Best in the shade were mondograss, dwarf mondograss, Supergreen, aztecgrass, variegated mondograss, Royal Purple, Variegata, Webster, Christmas Tree and Samantha.

Best in the sun were dwarf mondograss, Supergreen, Variegata, Big Blue, mondograss, Densiflora, Royal Purple, Samantha, Silvery Midget and Webster.

Best overall were dwarf mondograss, Supergreen, mondograss, Variegata, Royal Purple, Webster, variegated mondograss, aztecgrass, Samantha and Big Blue. ■

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# Master Gardeners Help Make Louisiana Beautiful

## *1,500 Strong, the Volunteer Program Keeps Growing*

Rosemary Funk of Lafayette has been a Master Gardener since 2000, when she retired and decided it was time to start doing something in the yard. "It's like going to college all over again," she said of the 40 hours of instruction she took in the LSU AgCenter volunteer training program.

Funk, who volunteers her new gardening skills with Habitat for Humanity and at Lafayette Community Hospital, said she enjoys "meeting people and getting new ideas."

The Louisiana Master Gardener program is an LSU AgCenter service and educational activity that teaches volunteers how to help Louisiana home gardeners do a better job. The trained volunteers provide unbiased, researched-based educational assistance in consumer horticulture for the gardening public.

Robert Usher of Luling, a Master Gardener for three years, said he became one because "it sounded like something I want to get involved in."

The retiree said he has made a lot of friends as a member of the River Region Master Gardeners, comprising about 40 people from St. James, St. John and St. Charles parishes. Among their activities, the group works with heirloom plants at the Vintage Garden at Destrehan Plantation.

Colleen Scott of Independence discovered the program nearly six years ago when she joined the first Master Gardener class in Tangipahoa Parish. Scott is from a farm background, "but it's different in the South," said the Pennsylvania native who has lived in Louisiana since 1982.

When she first moved to Louisiana, she had a hard time gardening in the new climate.

"Master Gardeners was exactly the thing I needed," she said.

Scott said she uses her Master Gardener skills with 4-H clubs, local garden clubs, nursing homes, community gardens and "pocket gardens" in local towns.

Louisiana boasts more than 1,500 active master gar-

deners who have completed at least the required 40 hours of intensive, practical horticultural training. Their "fee" for this education is to donate at least 40 hours of service to their communities.

"Many do far more than 40 hours," said Bob Souvestre, LSU AgCenter horticulture specialist and coordinator of the statewide program.

The Louisiana Master Gardener program started in Baton Rouge in 1994 and was adopted statewide in 1997. The program is currently offered in 20 parishes with volunteer participation in 40 parishes.

Wendy Miller of Ponchatoula moved there from LaPlace but is still active in the River Region group. "I wanted to be a master at something," she said, explaining why she first became a master gardener. She calls Master Gardeners "a wonderful resource."

Master Gardeners share their knowledge many ways, including answering horticulture-related telephone calls at the parish AgCenter office, speaking to garden and civic clubs, working with youth or senior groups and participating in community events.

After the first year, Master Gardeners are required to volunteer at least 20 hours and attend 6 hours of approved continuing

education programming to maintain the title of Louisiana Master Gardener.

"You're closer to God's heart in the garden than anywhere else on earth," said Vivian Neely of Baton Rouge, who became a Master Gardener in 2002. She said she enjoys volunteering and helping make her city more attractive.

Neely volunteers at the LSU AgCenter's Burden Center – "the only place I felt very peaceful was at Windrush Garden," she said of a difficult period in her life. She helps at Windrush Garden, part of the Burden Center – planting, trimming and maintaining the garden.

The Louisiana Master Gardener program is part of a larger, national program that began in Washington State in the 1970s. Master Gardeners are all-volunteer organizations sanctioned by land grant institutions in each state and function as an extension of the college or university. The parent organization in Louisiana is the LSU AgCenter. People who have the desire, commitment and time to learn and want to put their knowledge and skills to work through volunteer service may apply for admission to the Master Gardener program. Information is available through AgCenter offices in each parish. ■ **Rick Bogren**

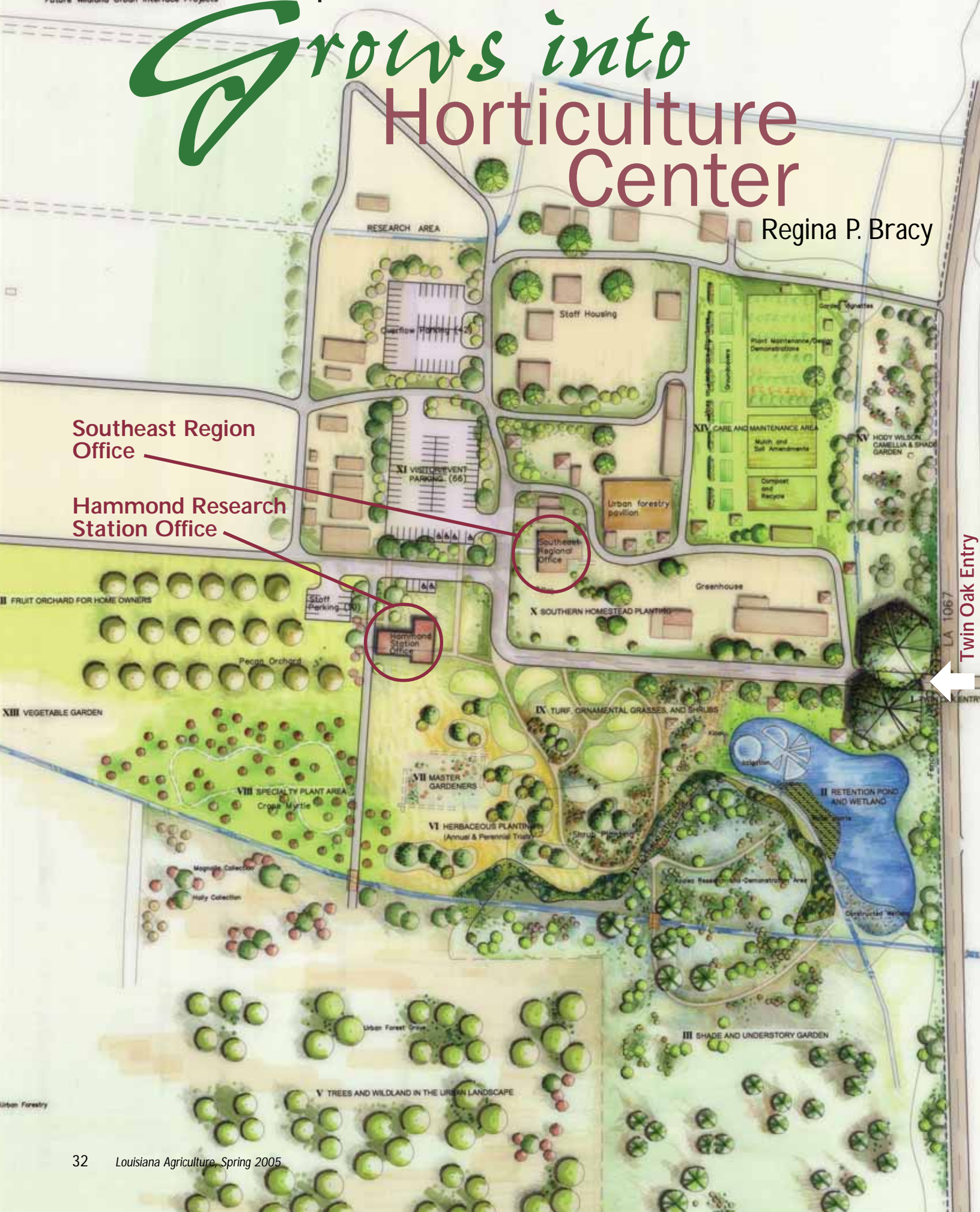
Photo by John Wozniak



East Baton Rouge Parish Master Gardeners work at the Burden Center in Baton Rouge.

# Grows into Horticulture Center

Regina P. Bracy



Southeast Region Office

Hammond Research Station Office



Twin Oak Entry

LA 1067



Established as the Fruit and Truck Experiment Station in January 1922, the LSU AgCenter's Hammond Research Station has served the needs of the strawberry and vegetable industries in Southeast Louisiana for more than 80 years. While continuing to serve the traditional strawberry and vegetable industries, the station has embarked on a new initiative to provide research and education for the green service industry.

With more leisure time and changing social attitudes, people are increasingly interested in improving the environments in which they live and work. Landscape horticulture (for professionals and consumers) is the science and art dedicated to enhancing peoples' lives through proper selection, growth, placement, care and use of plants in exterior surroundings.

A Landscape Horticulture Research and Extension Center is being developed at the Hammond Research Station to address the needs of the landscape and green industries. The center will provide research-based information on improving the quality of urban and suburban life by focusing on human-affected environments. Major research and educational components include the following:

### Twin Oak Entry

Two 100-year-old oaks grace the entrance to the station. These oaks will be used in urban tree preservation workshops for demonstrating restoration and preservation of historic trees. The trees have been pruned and mulched and will be lighted by the end of 2005.

### Retention Pond, Constructed Wetland

As well as adding aesthetic drama to the entry of the botanical gardens, a retention pond and constructed wetland will serve as a demonstration and research area focusing on how excess runoff from landscapes can be reduced and how landscape pollution can be mitigated. Various plants will be grown in the wetland and evaluated for nutrient, chemical and erosion abatement as well as appearance. The U.S. Department of Agriculture's Natural Resources Conservation Service has surveyed the area, and the retention pond and wetlands have been designed. Construction should begin in the summer of 2005.



Two 100-year-old oaks grace the entrance to the station. These oaks will be used in urban tree preservation workshops for demonstrating restoration and preservation of historic trees. The trees are to be lighted.

### Shade, Understory Garden

One of the best assets of the Hammond Research Station is an established pine forest. This mature pine stand provides an important natural environment duplicated across Louisiana and the Southeast. This area offers tremendous potential for research and demonstration in use of shade and understory plantings and preservation of wild land. Plant introduction, adaptability and sustainability will be study topics for this area.

### Azalea Research, Demonstration Area

A major azalea collection will be located in the shade and understory garden. Consumers and professionals will be able to view plant type and form; flower color, size and type, and bloom season and length for different azalea species. Azaleas best adapted to the Southern climate will be identified.

### Naturalistic Edge

An undulating border between the formal gardens and pine forest, this 6- to 15-foot-wide band will be used to identify aesthetic transition from lawn to wildland and include visual examples and study areas of naturalistic plantings for upland, lowland, shade and sun areas. Identification of native plants that

have landscape potential and demonstration of native plant associations in the landscape-wildland interface will be an integral part of this edge. Other benefits will be evaluation of plantings for sound barrier, screening and wildlife habitat.

### Herbaceous Shrubs

Small island groupings of single species and combinations of annuals and perennials will demonstrate composition, compatibility, design use and combination alternatives (color, texture and form). Evaluation of new introductions for growth, vigor, aggressiveness; bloom; reliability; season; heat/cold, sun/shade and soil-moisture tolerance; and disease susceptibility will be conducted. Structural plantings will be included to define and anchor spaces and for visual appeal. Combinations of foundation plants and annuals and perennials will be evaluated for year-long interest and compatibility.

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*Regina P. Bracy, Professor and Resident Coordinator, Hammond Research Station, Hammond, La.*

## Urban Forest Grove

Three to five specimens of several tree species will be planted for an urban forest grove. The use of truly native trees and shrubs for different habitats



*A two-story Southern house built in the late 1800s is a significant architectural aspect of the Hammond Research Station.*

or areas of the state will also be studied, as will cultivar evaluations and cultivation requirements of lesser known native trees and plants. The maintenance of these trees will provide training and demonstration opportunities. Over time these trees will provide research opportunities in suitability for urban uses, maintenance practices and new arboricultural materials and methods. With the cooperation and help of the Louisiana Department of Agriculture and Forestry (LDAF), almost 100 trees comprising 32 species have been

planted, and initial data collected. A walking trail has been marked out.

## Firewise Urban Forestry

Two small woodland areas on the station will be used to demonstrate firewise concepts, prescribed fire uses and fire-dependent ecosystems. The area will be divided into various plots that will receive different treatments such as winter burn, summer burn, mechanical fuel reduction, invasive species control and various methods of fire line construction and maintenance. This area will be used for training and research in firewise urban forestry and landscaping. It is managed in cooperation with the LDAF. Eco-areas are being identified and selective clearing and controlled burning are being done to prepare for establishing research areas.

## Care, Maintenance Area

This area is designed as a teaching lab for developers, landscape architects,

Photos by Regina Bracy



*The landscaping of the house will be part of the educational program. It is surrounded by "homestead" plants, which duplicate 30- to 50-year-old landscapes found throughout the South. The house now provides offices for the LSU AgCenter's Southeast Region.*

contractors, maintenance, growers, retailers and consumers. Research plots and facilities have been installed, and plant evaluations and maintenance research is being conducted.

## Specialty Plant Area

Collections of popular and exceptional plants such as crape myrtles, hollies and ornamental magnolias will be showcased and evaluated in this section. This dynamic exhibit and evaluation area will represent new and expanded areas of ornamental horticulture diversity.

## Southern Homestead Planting

A two-story Southern house built in the late 1800s is a significant architectural aspect of the station. This former residence, which has been remodeled and houses the Southeast Region Office, is surrounded by "homestead" plants, which duplicate 30- to 50-year-old landscapes found throughout the South. This site provides a special opportunity to introduce a wider assortment of classic, homestead and enduring plant species to the landscaper and also will be used to demonstrate how established plantings can be renewed and complemented with new and fresh additions.

The homestead garden was established in 2004. Additional homestead plants will be included as they are located.

## Hody Wilson Camellia, Shade Garden

A legacy of the Hammond Research Station is a collection of camellias from the early work of W.F. "Hody" Wilson Jr., which exists in a grove planting across the highway from the station entrance. Cuttings, grafts and stock plants will be moved to a new commemorative site in a pine grove shade area adjacent to the care and maintenance area on the station. This garden area will be used for preservation, collection, evaluation and cultivation of camellias and other shade-loving plants. The current Wilson Camellia Garden is showcased each February with a camellia stroll sponsored by the Tangipahoa Parish Master Gardeners. ■

# Bracy Helps Set New Course for Hammond Research Station

Two years into her job as resident coordinator of the Hammond Research Station, Regina Bracy still considers it challenging and fun.

Bracy, who is a professor and the first female to lead any of the LSU AgCenter's 20 research stations, has spent most of her life at the station she now oversees.

"It's been a whirlwind," she said of one of her first assignments, which was to set a new course for the station as the new Landscape Horticulture Research and Extension Center.

When asked if her gender is an advantage or disadvantage, she said neither. "I was raised with four brothers, so I am accustomed to being treated as one of the guys. And I've never used that either way. I just always did my job, and I feel that I've been treated fairly and with respect."

To listen to Bracy discuss the functions of the research station, you get the feeling there is a full committee in the room, because there is never the pronoun "I" used; it's always "we."

"The first thing we did was to present a plan to the chancellor outlining what we wanted to do at the station. We're not changing anything as far as our basic, traditional research that we have done here in strawberries and vegetables."

She said her plan is to continue this research and to add on landscape horticulture.

"When you're starting something from scratch, there are a lot of details and things that have to be done. None of this could have been accomplished without the enthusiastic support of the faculty and staff at the station. The first thing we did was to call our stakeholders and asked them to serve on an advisory committee so they could help us to develop this new center," Bracy said.

The request from the committee was to help shape this program in a way that it would truly help serve the needs of the industry.

"The consumers are going to receive the information that we disseminate, because our research-based information will aid them, but we're mainly looking at the commercial industry. These are the people who make their living from installing plants, and people who maintain plants in people's yards and businesses.

"This is big business. It's worth \$266

million right here in Louisiana," Bracy said.

Research and the operation of the Hammond station are not new to Bracy, since she spent so much time there when she was growing up.

As a child, Bracy watched her dad, William A. Poillion, work at the Hammond Research Station. He was an associate professor of horticulture at the station, where he did the research on strawberry and vegetable cultural practices.

"My father started out as an extension agent in Concordia Parish. He worked there

Photo by Mark Claesgens



*Regina Bracy grew up across the road from the Hammond Research Station, where she is now the resident coordinator.*

for a few years, and then was hired here at the station," Bracy said. "So I moved to the station when I was 2 years old and lived here until I went to college."

Bracy earned her bachelor's degree in plant science in 1975 from Southeastern Louisiana University in Hammond, her master's degree in 1978 from LSU and her doctoral degree in horticulture in 1990 from LSU.

During that time, she returned to the Hammond Research Station in 1982 as a research associate and actually worked with her father a couple of years at the station before he retired in 1986.

And her father is the person Bracy credits with getting her interested in the horticulture industry.

"My dad came and gave a talk to my

civics class when I was in high school, and I decided then that this sounds like something that I'd like to do – and I've been involved ever since," she said.

Bracy replaced Dr. Roy Constantin as research coordinator at the station – and she boasts a long history alongside Constantin, as well.

"Dr. Constantin knew me when I was a 10-year-old climbing trees and also as a professional," she explained.

"I'm excited about some of the new changes we have going on at the station, and I'm excited about the opportunity for putting things into operation that I've had in mind for a long time," she said of her new role.

The LSU AgCenter's Hammond Research Station traditionally has been a fruit and truck crop experiment station that did research on fruits and vegetables. It is one research facility in a statewide system that looks at areas ranging from dairy and beef cattle to citrus and aquaculture to cotton and soybean production.

"Back in the 1980s, we did have an ornamental program at the station, but it was discontinued due to a lack of funds," Bracy said. "So just recently the chancellor met with everybody and asked us what we saw as the future."

Bracy said that's when she proposed the idea that the Hammond facility needed to go back and concentrate on the "green industry," which is landscape horticulture.

According to Bracy, this industry has been underserved by the LSU AgCenter, because it's a relatively new concept for the AgCenter. She says the need for such re-



Mr. and Mrs. William A. Poillion are Bracy's parents. Poillion is a former associate professor at the Hammond Research Station, where he did research on strawberries and vegetables.

search is obvious, because the industry is taking off across the country and more people are seeking information.

"The consumers need the information, and our research and extension efforts have really not kept up with the demand," Bracy said. "That's why we need to move in this direction."

Bracy said she hopes to obtain funding to add a garden arboretum to the station. That facility would serve not only for its beauty but also as a teaching tool – on topics ranging from plant varieties to different types of irrigation patterns.

"We will also use the garden to teach

landscape contractors and landscape maintenance people and their workers such things as how to prune plants, what are the best mulches to use and how to set up irrigation," Bracy explained.

With new ideas and a position that allows her to implement some of them, Bracy said she's excited and happy to serve as the research coordinator at the Hammond Research Station.

For additional information about upcoming activities and additions to the research station, contact Bracy at (985) 543-4125 or [rbracy@agcenter.lsu.edu](mailto:rbracy@agcenter.lsu.edu). ■

**Johnny Morgan**

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