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LSU AgCenter
Research & Extension

LSU AgCenter Honors Outstanding Faculty Members

The LSU AgCenter honored four individuals and a team of research and extension faculty members during its 2002 annual conference in December.

The honorees for the LSU AgCenter's top awards were Joan McCrory, who received the Triad Nitrogen Award for Extension; Dan Satterlee, the Triad Nitrogen Research Award; Lee Southern, the Doyle Chambers Research Award; Ed Twidwell, the Floyd S. Edmiston Award; and a group known as the Sweet Potato Research and Extension Team, the Tipton Team Research Award.

McCrory, whose lifelong commitment to 4-H began when she was a 9-year-old student in Acadia Parish, is on the state 4-H staff in Baton Rouge and has a 33-year record of professional service to 4-H.

Satterlee was singled out for his research in the area of poultry production. He has developed a vaccine that helps broiler chickens lay more eggs – an accomplishment that should boost the industry and promote AgCenter research. Satterlee also is looking at a technique to determine which animals can handle stress better. In addition to balancing his research with teaching responsibilities, he has secured more than $1 million to further poultry research.

Photo by John Wozniak

The 15-member team sweet potato team includes left to right, back row: Chris Robichaux, Chris Clark, David Picha and Abner Hammond; middle row: Paul Wilson, Don LaBonte, Rick Story, Arthur Villordon, Earnest Freeman and Steve Kelly; front row: Myrl Sistrunk, Rodrigo Valverde, Gene Burris and Mike Cannon. Not pictured is Gerald Roberts.

Southern, whose most significant accomplishment is in the area of animal nutrition, works with the nutrition of pigs. His research group was the first to show the benefits of organic chromium in the diet of pigs. Southern has published more than 100 papers in refereed journals, has written three book chapters and is co-editor of the second edition of a swine nutrition textbook. He also works closely with graduate students.

Twidwell's responsibilities include working with 4-H'ers, teaching a forage class and working with extension and research plots devoted to ryegrass performance trials. Twidwell is active in both the Louisiana Forage and Grassland Council and the American Forage and Grassland Council, and he is in line to become president of the national group.

The Sweet Potato Research and Extension Team combines the best qualities of the AgCenter's research and extension branches, says Mike Cannon, coordinator of the Sweet Potato Research Station and leader of the team. The team works directly with growers to promote the industry and to develop new varieties. Its most significant accomplishment thus far has been the development of the Beauregard sweet potato variety, which revitalized the industry in Louisiana and has proven to be one of the most popular varieties ever. ■ **Jane Honeycutt**

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Volume 46, Number 1, Winter 2003

FEATURES

BRIEFS

ON THE COVER

Can you guess the name of this fruit? John Wozniak photographed it at the Red Stick Farmers' Market in Baton Rouge. Is it a) kumquat, b) pomegranate, c) persimmon? Answer on back cover. See article on farmers' markets on page 14.

Assuring Our Future Through Scientific Research and Education

Photo by John Wozniak

LSU AgCenter engineers Steven G. Hall and Randy R. Price are tackling the age-old problem of birds' stealing the livelihood out from under catfish and crawfish farmers. They are creating a series of robotic boats to scare birds.

'Scarebot' reduces bird predation on ponds

Steven G. Hall and Randy R. Price

Predatory birds cause problems for aquaculture farmers because they eat their crops. In Louisiana, birds such as cormorants and pelicans prey on young catfish and crawfish, which costs producers thousands of dollars each year in lost revenue. The LSU AgCenter Aquaculture Research Station has lost not only fish because of bird predation, but also the valuable research associated with them.

To reduce loss, aquaculture farmers may spend up to as much as $100,000 a year on bird abatement programs. One of the most common approaches to scare birds from ponds is the use of sonic cannons. They work well initially, but

Table 1. Numbers of birds and percent reduction with boat on pond and no boat on pond.

	Cormorants			Wading Birds		
	No Boat	Boat	Reduction in Birds(%)	No Boat	Boat	Reduction in Birds(%)
Average Birds per Hour	5.45	0.81	85.05	4.47	1.36	69.58
Average Birds per Day	71.57	20.67	71.12	56.86	20.42	64.09

Steven G. Hall and Randy R. Price, Assistant Professors, Department of Biological and Agricultural Engineering, LSU AgCenter, Baton Rouge, La.

the birds become accustomed to the loud noises, and the cannons can be bothersome to surrounding communities.

Poisons, scarecrows and nets also are used. Poisons work well but may kill other species as well as the troublesome birds. Scarecrows may work for short periods, but just as with the cannons, the birds become used to them. Nets are costly and difficult to mount on ponds larger than five acres.

An alternate approach being developed at the LSU AgCenter and tested at the Aquaculture Research Center is a small, self-guided boat – a "scarebot." These robotic boats, which resemble miniature houseboats, are solar-powered and have top speeds ranging from 5 to 7 miles per hour. One model of the boats is equipped with an infrared sensor to detect motion, which in turn triggers a water cannon that annoys and drives away the birds.

Propelled by paddle wheels, the boats have shore sensors that keep them from running aground. The sensors close a magnetic switch when the boat touches shore and guide the boat to turn back into the pond.

LSU AgCenter researchers are studying use of a portable GPS (global positioning system) to maintain the boats within a predefined area, such as part or all of a pond or reservoir. Some of the boats have operated for weeks with minimal human intervention.

Advantages of using robotic boats include reduced human input, fewer errors and lower costs than other abatement programs. Challenges include maintaining power, control and self-sufficiency, as well as potential safety and maintenance concerns.

Robotic boats are highly effective at reducing bird predation on selected aquaculture ponds (Table 1). Besides the possibility of helping the aquaculture industry, the robotic boats have the potential for many other environmental management applications such as measuring water quality. Research is continuing.

To test the effectiveness of the boats, the U.S. Department of Agriculture is interested in comparing the robotic boats with other methods such as netting over ponds and propane sonic cannons. The study is set to begin in the spring of 2003.

For more information, visit the Web site at www.bae.lsu.edu/research/scarebot.htm. ■

Photos by John Wozniak

The thin metal rods on each side contain shore sensors that keep the boat from running aground. The painted head sticking up from the boat contains an infrared sensor to detect motion, which triggers a water cannon that annoys and drives away the birds.

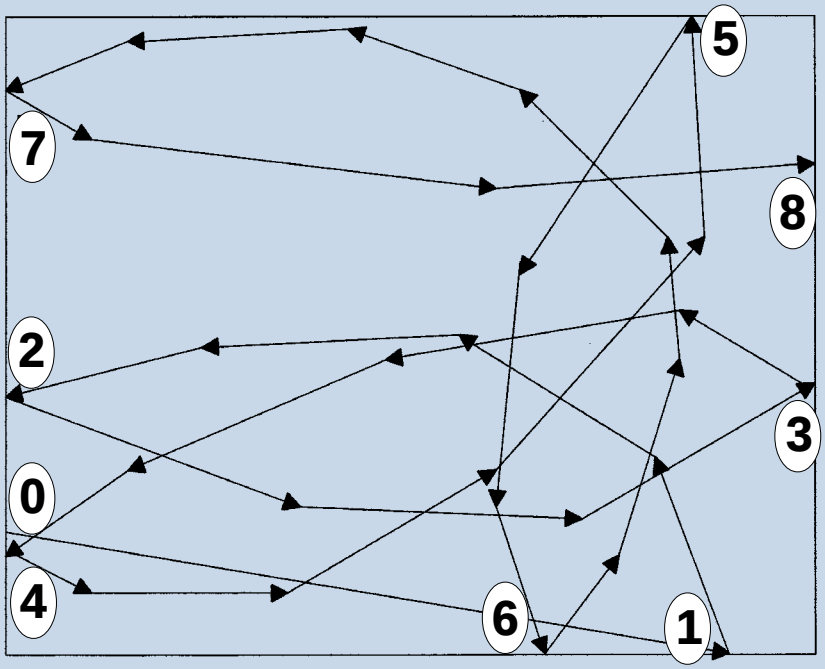
This is one of the first models created by the LSU AgCenter engineers. The boats are propelled by paddle wheels and reach top speeds of 5 to 7 miles per hour.

The solar panel on top of the scarebot powers the battery that keeps it moving around the pond.

Photo by John Wozniak

These two prototypes of the scarebots are each about 4 feet by 4 feet in area and about 18 inches high. The LSU AgCenter engineers are also working on larger models to be used in lakes and reservoirs.

Figure 1. Diagram of boat location on a 0.6 hectare pond in 30-minute period. June 15, 2001.



Scarebots Generate News

Robotic boats that scare away birds have generated media interest around the world. The two LSU AgCenter scientists working on this project have received calls from and done interviews with reporters from many publications and broadcast media. Articles have been published in such magazines as *Newsweek* and *Popular Mechanics*. A German magazine, *Bild der wissenschaft*, published an article titled "Roboter: kunstliches krokodil gegen pelikane." Web sites that have used information about the project include Discovery, the EDTN Network and ZZZ Online (Russia). ■

Scaring Away Birds with Boats

It's a scene that would captivate Alfred Hitchcock – large flocks of birds causing havoc in a community. But the community in this case is not a quaint coastal village but catfish and crawfish ponds across the South.

LSU AgCenter agricultural engineers Randy Price and Steven Hall are developing robotic boats that will keep these winged predators out of commercial ponds.

The engineers are also working on a larger model approximately 8 feet by 8 feet. This model's target use is on larger lakes and reservoirs.

Most of the boats run autonomously, but one model can be controlled using radio signals.

"Shore feelers" keep the boats from running aground. A global positioning system is being implemented as another method of steering. Remote sensors on several of the prototypes trigger water cannons to scare away birds. The range of these cannons is similar to a common lawn jet sprinkler.

"We've had these boats on a number of commercial ponds, which are larger, and add challenges that we need to address with further developments," Hall said.

The biggest challenge has been the wind. Because commercial ponds are larger, wind resistance is greater. Hall and Price are working on a model that will work upwind and then float downwind to conserve power.

The boats could be outfitted to collect environmental data.

"Sensors on the boats could record temperature, dissolved oxygen or ammonia levels. This information could then alert a farmer of a potential problem on his pond," Price said.

Price cannot estimate a scarebot's cost at this time, but the aim is for the boats to be affordable.

"It will take care of the farm pond without the farmer having to put human labor into it," Price said." ■

Craig Gautreaux

Foliar-applied Fungicides in Soybean Disease Management

Boyd Padgett, Ray Schneider and Ken Whitam

Each year diseases adversely affect soybean profitability. In 1999, for example, 4.37 million bushels were lost to disease in Louisiana. This was more than 17 percent of the total yield.

The predominant soybean diseases in the state are aerial blight, Cercospora blight/purple seed stain, pod and stem blight, and anthracnose.

These diseases, except aerial blight, can be found in all soybean-producing regions of the state. Aerial blight is favored by high humidity and is prevalent in the southern part of the state. Although aerial blight is potentially the most devastating soybean disease, an increased incidence in Cercospora blight has caused concern among Louisiana growers. Anthracnose and pod and stem blight are late-season diseases affecting the pods and can harm seed quality and yield when conditions favor their development.

Soybean diseases are managed using disease-resistant varieties and fungicides. The producer's best option is resistant varieties, but fungicides are needed when disease pressure is severe or when resistant varieties are not available. Applications can cost $15 to $20 per acre and should be used only when necessary. These applications are likely to reap economic returns in locations with frequent afternoon and late-evening rains and high temperatures beginning mid-season.

Benlate was once the fungicide of choice, but this product has been removed from the market. This fungicide was used to manage Cercospora diseases and to suppress aerial blight. Topsin-M is similar to Benlate and has filled its niche. Quadris, a relatively new fungicide, is active on aerial blight, pod and stem blight, and anthracnose but is not as effective as Topsin-M against Cercospora. This difference in activity for these fungicides makes it critical to identify which diseases are present when selecting a product. Substantial information has been generated on Topsin-M; however, information on the activity and use of Quadris is not as extensive. The disease control spectrum of Quadris has been defined, but information on soybean seed quality and maturity is limited.

Quadris was evaluated in several LSU AgCenter tests conducted at the Ben Hur Research Station near Baton Rouge, the Macon Ridge Research Station near Winnsboro, the Northeast Research Station near St. Joseph and the Rice Research Station near Crowley. Diseases present and severity varied among years and locations. The predominant disease at Ben Hur and the Rice Research Station was aerial blight; pod diseases (anthracnose and pod and stem blight) and Cercospora blight were present at the Macon Ridge and Northeast stations.

Northeast and Macon Ridge Tests

Quadris was evaluated in soybean maturity groups IV or V during the 2000, 2001 and 2002 growing seasons. These maturity groups are the most popular in Louisiana and planted between mid April and mid June.

Quadris was applied at two rates, either 6 or 9 ounces per acre, and at two stages of development, either pod initiation (R3) only, seed initiation (R5) only or at both stages (R3 and R5). See accompanying tables.

Pod diseases were prevalent across years and tests; however, Cercospora blight was severe in 2002. Six or 9 ounces of Quadris applied at the pod completion or at both growth stages effectively reduced pod diseases compared to non-sprayed soybeans (Tables 1 and 2). Quadris was not as effective in reducing Cercospora epidemics. The percentage of green stems was higher and foliage was

Boyd Padgett, Associate Professor, Macon Ridge Research Station, Winnsboro, La.; Ray Schneider and Ken Whitam, Professors, Department of Plant Pathology and Crop Physiology, LSU AgCenter, Baton Rouge, La.

Photo by Boyd Padgett

Anthracnose is a late-season disease affecting the pods and can harm seed quality and yield when conditions favor their development.

greener longer in plots receiving fungicide applications than in non-sprayed plots (Table 3). Seed quality was best in soybeans receiving sequential applications of Quadris at both growth stages. Yield response to fungicide applications varied across tests and years with yield increases over non-sprayed soybeans ranging from one to six bushels. These increases were associated more often with applications made at seed initiation or sequential applications at both growth stages.

Ben Hur Research Station Tests

In tests conducted at Ben Hur, Quadris was applied at 3, 6, 9 or 12 ounces per acre at both growth stages. Six ounces of Quadris applied at pod initiation and seed initiation provided a high level of aerial blight control, resulting in a 13 bushel per acre yield increase over non-sprayed treatments (Table 4). In addition, pod diseases were controlled, which resulted in a substantial increase in seed quality compared with the non-sprayed plots. Benlate was not effective in controlling aerial blight, and it follows that Topsin-M also will not be effective in controlling this disease. Consistent with results from tests conducted at the Macon Ridge and Northeast stations, higher percentages of green stems were observed in fungicide-treated plots. Similar results were obtained in tests conducted at the Rice Research Station where aerial blight was severe.

Quadris is effective for managing aerial blight, anthracnose, and pod and stem blight. An application during pod

Table 1. Effect of foliar-applied fungicides on soybean pod and foliar diseases and soybean yield, (Delta & Pine Land SG 498RR), Northeast Research Station, 2001-2002.

			2001		2002			
Fungicide	Rate/A	Time of appl[a]	Pod disease[b]	Yield bu/A	CB[b]	Pod disease[b]	Seed quality[c]	Yield bu/A
Nonsprayed	—	—	6.7	60	6.7	2.8	17.7	66
Quadris	6 fl oz	R3	6.8	62	4.6	2.0	16.6	62
Quadris	9 fl oz	R3	6.0	61	3.7	1.8	5.7	62
Quadris	6 fl oz	R5	2.8	62	2.2	1.0	4.5	68
Quadris	9 fl oz	R5	2.6	64	2.8	1.0	12.7	70
Quadris	6 fl oz	R3/R5	3.0	63	2.5	0.8	2.1	70
Quadris	9 fl oz	R3/R5	2.2	62	2.1	0.8	0.5	75
Benlate	16 oz	R3/R5	4.7	61	—	—	—	—

[a] *R3 = pod initiation; R5 = seed initiation*
[b] *0-10 scale, where 0 = no disease, 10 = completely diseased or defoliated.*
[c] *Percentage purple stained or shriveled seed.*

Photo by Ken Whitam

Aerial blight is favored by high humidity and is prevalent in the southern part of Louisiana. Aerial blight is potentially the most devastating soybean disease. LSU AgCenter research shows Quadris is effective for managing aerial blight.

Table 2. Effect of foliar-applied fungicides on soybean pod and foliar diseases and soybean yield (Asgrow 5901RR or Delta King 5464RR), Macon Ridge and Northeast research stations, 2001-2002.

			2000			2001		2002		2002	
Fungicide	Rate/A	Time of appl[a]	CB[b]	Pod disease[b]	Yield bu/A	Pod disease[b]	Yield bu/A	CB[b]	Yield bu/A	CB[b]	Yield bu/A
Nonsprayed	—	—	2.8	2.6	30	1.38	58	5.5	47	7.8	46
Quadris	6 fl oz	R3	—	—	—	0.25	63	4.8	50	5.3	41
Quadris	9 fl oz	R3	1.3	1.3	30	0.25	63	3.8	51	4.3	50
Quadris	6 fl oz	R5	—	—	—	0.50	60	4.3	50	5.3	49
Quadris	9 fl oz	R5	1.8	0.8	33	0.25	64	4.0	52	6.0	45
Quadris	6 fl oz	R3/R5	—	—	—	0.25	66	4.3	52	4.0	47
Quadris	9 fl oz	R3/R5	1.3	0.4	34	0.25	67	3.8	53	4.3	49
Benlate	8 oz	R3/R5	1.3	1.3	28	0.88	60	—	—	—	—

[a] *R3 = pod initiation; R5 = seed initiation.*
[b] *0-10 scale, where 0 = no disease, 10 = completely diseased or defoliated.*

Table 3. The effect of foliar-applied fungicides on soybean senescence, Macon Ridge and Northeast research stations, 2001-2002.

Fungicide	Rate/A	Time of appl[a]	Percent green stems[b]	Percent defoliation[c]
Nonsprayed	—	—	0.3	91
Quadris	6 fl oz	R3	25	78
Quadris	9 fl oz	R3	55	70
Quadris	6 fl oz	R5	28	70
Quadris	9 fl oz	R5	42	74
Quadris	6 fl oz	R3/R5	63	59
Quadris	9 fl oz	R3/R5	58	65
Benlate	16 oz	R3/R5	0.5	—

[a] R3 = pod initiation; R5 = seed initiation.
[b] Percent green stems in Asgrow 5901RR in 6 feet of row on Oct. 1, 2000.
[c] Percent defoliation averaged across three tests conducted in 2002.

initiation was effective in controlling aerial blight; applications at seed initiation were most effective for controlling pod diseases. Therefore, to control both diseases effectively, applications at both pod initiation and seed initiation may be necessary. Quadris also provided suppressive activity against Cercospora blight and preserved seed quality in some tests. Senescence was delayed, however. This is the stage where leaves turn brown and fall off. This delay allowed more time for pod fill, resulting in higher yields.

A 6.2-ounce application of Quadris, the labeled rate, costs about $16 per acre, and a 9-ounce application costs about $23 per acre. To manage pod diseases, a 6.2-ounce application of Quadris at seed initiation could be economical when disease was severe. Therefore, applications should be considered when extended periods of rainfall occur during the reproductive growth stages of soybean development.

In South Louisiana, aerial blight is the most important yield-limiting disease, and an application of Quadris at 6.2 ounces per acre at pod initiation should provide economical control when this disease is severe in susceptible varieties. While the 9- or 12-ounce rates were effective, they were not always more economical than the 6-ounce rate. Furthermore, sequential applications of Quadris provided adequate disease control but were cost prohibitive. The LSU AgCenter is conducting research to further define rates and application timings. ■

Photo by Ken Whitam

Cercospora blight is one of the predominant soybean diseases in Louisiana and is on the increase in the state.

Table 4. Effects of rates and times of application of Quadris and Benlate on aerial blight, pod and stem blight, plant senescence and yield in soybean (Deltapine 5644 RR), Ben Hur Research Station, 2000.

			Inoculated[a]		Noninoculated[b]			
Fungicide	Rate/A	Time of appl[c]	Aerial blight[d]	Yield (bu/A)	Pod disease severity[e]	Percent green stems[f]	Seed quality index[g]	Yield (bu/A)
Non-sprayed	—	-	4.0	39.6	5.2	0.0	44.5	48.7
Quadris	6 fl oz	R3	2.1	47.6	2.8	10.8	28.4	50.4
Quadris	6 fl oz	R3/R5	2.0	52.6	2.8	38.8	12.5	54.0
Quadris	6 fl oz	R5	2.4	45.6	3.2	7.0	20.0	46.2
Quadris	9 fl oz	R3	1.9	51.1	2.5	10.8	-	48.5
Quadris	9 fl oz	R3/R5	1.9	55.4	2.0	32.5	-	56.5
Quadris	9 fl oz	R5	2.8	44.1	2.5	7.0	-	49.2
Benlate	12 oz	R3/R5	3.1	43.7	4.5	11.2	36.1	46.5

[a] Plants were inoculated with Rhizoctonia solani on Aug. 1, 2000.
[b] Naturally occurring aerial blight epidemics.
[c] R3 = pod initiation; R5 = seed initiation.
[d] 1 to 5 scale, where 1 = no disease; 5 = uppermost leaves and pods infected. Rated Sept. 4, 2000.
[e] 1 to 9 scale, where 1 = no disease; 9 = 100% disease incidence. Rated Sept. 26, 2000.
[f] Percent of stems that were still green when nonsprayed plots were completely senesced in noninoculated plots. Rated Sept. 26, 2000.
[g] Percent seeds that were shriveled or discolored.

Landscape Performance of Warm-season Annual Bedding Plants

Photo by Allen Owings

Pentas are among the best plants for butterfly gardens.

Allen Owings, Gordon Holcomb and Anthony Witcher

The number of annual bedding plant species and varieties available for residential and commercial landscape has increased dramatically in the last five to 10 years. Since 1994, the LSU AgCenter has conducted trials to determine the landscape performance of many warm-season annual bedding plants under Louisiana's growing conditions. Results provide valuable information for home gardeners, landscape professionals, greenhouse crop producers and retail garden center managers.

Research and demonstration projects are conducted at the LSU AgCenter's Burden Center in Baton Rouge. Trials are conducted throughout the season using replicated plantings established in raised landscape beds located in full sun. A portion of the trial garden area receives some afternoon filtered shade. Beds are equipped with a micro-irrigation system. Plants are watered as needed, based on species requirements and current environmental conditions. Fertilization, weed control and similar cultural activities are conducted based on recommended practices.

Petunias proliferate

Petunias continue to be popular with many new releases each year. Most of the new petunias are seed-propagated spreading petunias. These include the "Wave" series along with six other petunia series. These petunias reach heights of about 12 inches and, as the name implies, spread about 2-3 feet. Colors available in the "Wave" series, which is the most popular and typically the best performer of the spreading petunias, include purple, pink, misty lilac and rose. In 2002, "Lavender Wave" was added and "Blue Wave" will be introduced in 2003. In LSU AgCenter trials, higher quality ratings for landscape performance have been seen with the rose and misty lilac colors.

During the 2000 trial, "Wave" series petunias were found susceptible to sclerotinia blight during January and February. Infected plants were not killed and had outgrown and recovered from the disease by May.

Over the last couple of years, "Tidal Wave" petunias have been introduced. These are classified as hedgiflora petunias. They reach a height of 3 feet with a spread of 3 feet. Colors available in the "Tidal Wave" group are cherry, pink, silver and purple.

Try melampodium

Melampodiums are not a well-known warm-season annual bedding plant but well worth growing based on LSU AgCenter observations. These plants produce yellow or golden daisy-like flowers and do well from late spring into fall. They should be planted in full sun with minimum irrigation for best performance. "Derby" and "Million Gold" are two varieties recommended.

Allen Owings, Professor, Department of Horticulture; Gordon Holcomb, Professor, Department of Plant Pathology and Crop Physiology; and Anthony Witcher, Research Associate, Burden Center, LSU AgCenter, Baton Rouge, La.

A new variety not yet tested at the LSU AgCenter is "Lemon Delight."

Alternaria leaf spot/blight may be a problem on these plants throughout the summer and fall, but can be controlled with repeated applications of fungicides.

Butterflies love pentas

Pentas are among the best plants for butterfly gardens. For years, the only penta series available was the "New Look" pentas. In LSU AgCenter trials the last two years, "Butterfly" pentas have been the better performers. They do well from late spring through the fall and are vigorous growers and prolific flower producers. No significant disease problems have been observed on the "Butterfly" pentas. They are available in a number of colors including lavender, blush and cherry.

Profusion of zinnias

The new "Profusion" zinnias, also known as landscape zinnias, are available in three colors – white, orange and cherry. All colors have been named All-America Selection winners. "Profusion White" and "Profusion Orange" have also been named Louisiana Select plants because of their superior landscape performance. Powdery mildew and leaf spot diseases that damage many of the traditional cut flower zinnias and bedding plant zinnias do not significantly bother the "Profusion" zinnias.

Another group of zinnias worthy of mention is the narrowleaf zinnias – the most popular of these is "Crystal White." They are similar in growth habit to the "Profusion" group but have smaller flowers and finer textured foliage.

Spreading begonias

"Dragon Wing Red" and "Dragon Wing Pink" are new begonias. These have different growth habits than landscape begonias. They are more spreading with larger foliage and hold up fairly well in a full-sun landscape planting. These begonias are worthy of increased use in the landscape and would also work well in container plantings.

Vincas come in more colors

Vincas, also referred to as Madagascar or rose periwinkle, are available in more colors and group habits than ever before. Many new flower colors and series are available. The new "Mediterranean" series grows horizontally and reaches only about 8-9 inches tall in a 2-foot spread. It does, unfortunately, seem prone to foliar diseases such as aerial blight during the summer when plants are over-watered or there is significant rainfall.

Photo by Allen Owings

The new "Profusion" zinnias, also known as landscape zinnias, are available in three colors – white, orange and cherry.

Other new series of vincas include "Heat Wave," "First Kiss," "Victory" and "Sunstorm." "Victory" along with the older series "Pacifica" and "Cooler" does best in LSU AgCenter trials. For success with vinca, we recommend waiting until May to plant, minimizing irrigation and making sure the soil pH is acidic.

Alternaria leaf spot, which causes defoliation, has become a problem in recent years during September and October on vincas.

In addition to warm-season, annual bedding plant evaluations, trials are conducted on cool-season, annual bedding plants, garden mums, poinsettias, herbaceous perennials, roses and other ornamental plants. These efforts will be enhanced in the next few years with the expansion of nursery and landscape research facilities at the Burden Center. ■

Photo courtesy of National Garden Bureau

"Dragon Wing Pink" is a new begonia. It has different growth habits than landscape begonias and is more spreading with larger foliage.

Wheat Yield and Maturity

Influence of Variety and Planting Date

H.J. "Rick" Mascagni Jr. and Stephen Harrison

Photo by Rick Mascagni

In North Louisiana wheat is planted in mid October to mid November and harvested from mid May to early June.

Wheat is a winter crop that is often part of a double-cropping system, most often followed by soybeans. There is considerable interest in double-cropping cotton and grain sorghum with wheat. In North Louisiana wheat is planted in mid October to mid November and harvested from mid May to early June. The optimal planting date is early May for soybeans and cotton and mid to late April for grain sorghum. Earlier wheat harvest would permit timelier planting of crops following wheat and ensure maximum yield and profitability.

Planting early-heading wheat varieties may permit earlier wheat harvests and planting of the following crop. Some early-maturing varieties are competitive in yield with later-maturing varieties, which make them good candidates for double-cropping systems. The effect of varieties and planting dates on yield potential and harvest maturity (based on grain moisture) is not well-documented.

Field experiments were conducted in 1998-1999 and 1999-2000 on Sharkey clay at the Northeast Research Station near St. Joseph to evaluate the influence of planting date and variety on yield and maturity date. Early, optimal and late planting dates were evaluated. Planting dates were: October 12 and 30 and November 27, 1998; and October 15 and 29 and November 18, 1999. The varieties were Pioneer 2691 (early maturity), Terral TV8825 (medium maturity) and Terral TV8557 (late maturity) planted at a seeding rate of 90 pounds per acre. Measurements included grain yield, heading date and date of 15 percent grain moisture. Data are presented as two-year averages.

Higher Yields with Early-maturing Variety

The early-maturing variety had a higher yield than the medium- and late-maturing varieties (Figure 1). The difference in yield between the early- and later-maturing varieties was least at the early planting and most at the late planting. The effect of relative maturity on grain yield is very dependent on climatic conditions throughout the growing season. If planted too early, early-heading wheat varieties produce excess fall and winter vegetation, which increases the risk of plant damage and yield loss from early spring freezes. Planting early-heading varieties later in the recommended planting window decreases the risk of damage from spring freezes. No early spring freezes occurred during the two years of this study.

The greatest differences in maturity among varieties occurred at heading. Differences in heading date between the

H.J. "Rick" Mascagni Jr., Professor, Northeast Research Station, St. Joseph, La.; and Stephen Harrison, Professor, Department of Agronomy, LSU AgCenter, Baton Rouge, La.

Figure 1. Influence of planting date and variety on grain yield at St. Joseph, averaged across years.

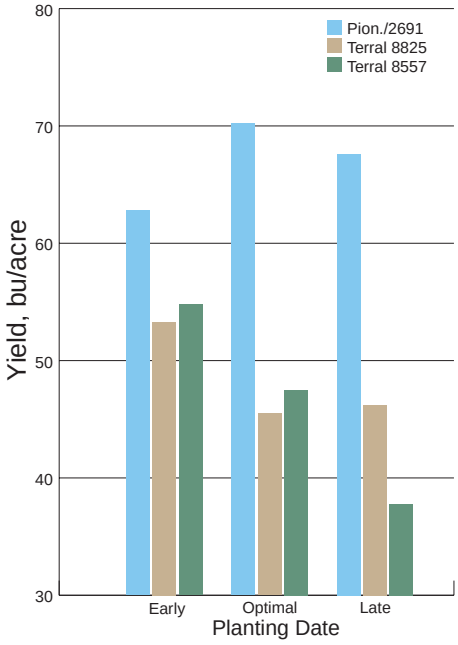
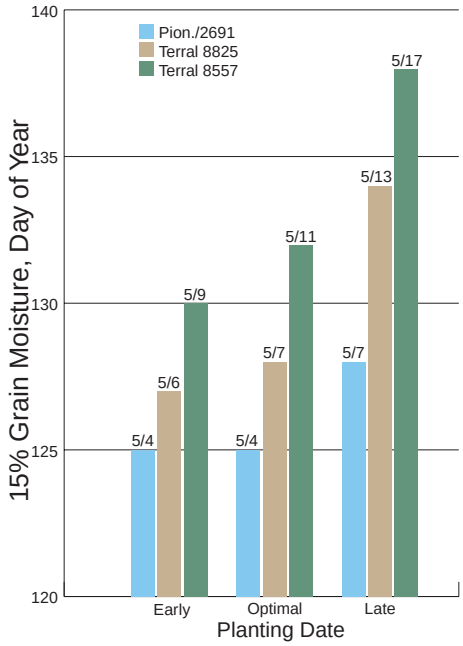


Figure 2. Influence of planting date and variety on date to 15% grain moisture at St. Joseph, averaged across years.



early and late varieties were 15 days for early planting (March 13 to March 28), 20 days for optimal planting (March 13 to April 2) and 17 days for the latest planting (March 23 to April 9).

Differences Narrow At Maturity

During grain fill and dry down, maturity differences among varieties narrowed significantly. Differences between the early and late varieties for date of 15 percent grain moisture were five days for early planting, seven days for optimal planting and 10 days for the late planting (Figure 2).

At both the early and optimal planting dates, all varieties reached 15 percent grain moisture by May 11. Date to 15 percent grain moisture was similar across planting dates for the early-maturing variety. When planted late, the early variety reached 15 percent grain moisture on May 7 compared to May 4 at the earlier dates. The early-heading variety reached harvest moisture at about the same time when planted late as the late-heading variety did when planted early, which supports the recommendation that early-heading varieties should be planted later in the fall and later-heading varieties earlier.

In summary, early-maturing varieties were competitive in yield with later-maturing varieties in years with no late spring freezes. Although there were relatively large differences among varieties for heading date, differences for date of 15 percent grain moisture were considerably smaller. Early planting did not hasten maturity appreciably compared to planting at an optimal date. Date of harvest moisture was not as affected by variety and planting date as was relative heading date. During the normal planting window, early- and medium-maturity varieties reached 15 percent grain moisture before May 10. When planted late, only the early variety reached 15 percent moisture earlier than May 10.

Higher temperatures in late spring appear to force wheat varieties to mature at about the same time regardless of heading date. The result is that late-heading varieties have a shorter grain fill period than early-heading varieties. The implications are that late-heading varieties may have lower yields and test weight when spring temperatures are unusually high, whereas early-heading varieties are more prone to spring damage when late cold spells occur. Since an early-heading date does not result in a proportionately earlier harvest date, a better option may be to harvest at relatively high grain moisture and artificially dry grain to desired moisture. This would permit earlier planting of the summer crop and prevent losses in grain quality and test weight that occur with rainfall following wheat maturity. ■

Photo by Rick Mascagni

Late-heading varieties may have lower yields and test weight when spring temperatures are unusually high, whereas early-heading varieties are more prone to spring damage when late cold spells occur.

CONSUMER USE OF

Consumer use of farmers' markets has been steadily increasing in the last few years. The number of markets in the United States has grown by 63 percent since 1994. As of 2002, there were 2,868 farmers' markets. Sales, which exceed $1 billion annually, are an important source of revenue for farmers, with 19,000 reporting that they sold only at farmers' markets. Farmers typically record gross sales of $200 to $600 per day; some bigger growers realize more than $1,000.

According to the U.S. Department of Agriculture (USDA), farmers' markets are defined as a common facility or area where several farmers and growers gather regularly to sell a variety of fresh fruits and vegetables and other food and farm products directly to consumers. Farmers' markets play a vital role in allowing small- to medium-sized growers access to consumers. Without this access, many small farmers would not be able to sell their produce, and their farming existence could be threatened.

Farmers' markets provide consumers with a pleasant shopping environment and the opportunity to meet the people who grow the food. A farmers' market in a community can establish close ties between farmers and consumers. Farmers' markets usually offer a prime location that costs much less than a private retail outlet. Rather than taking the full burden of insurance, advertising, physical facilities and other marketing costs, a farmer can share these expenses with others. There are minimal start-up costs and immediate access for new farmers.

Laura Lea Perault, Extension Agent, Livingston Parish, Livingston, La.; Frances C. Lawrence, Professor, and Carol E. O'Neil, Associate Professor, School of Human Ecology, LSU AgCenter, Baton Rouge, La.

Photo by Mark Claesgens

These photos are from the Red Stick Farmers' Market in Baton Rouge, La.

Eighty-two percent of the markets are self-sustaining; market income is sufficient to pay for all costs associated with the operation of the market. More than half (58 percent) of markets participate in the WIC coupon, food stamps, local and state nutrition programs, and 25 percent of markets participate in programs that help food recovery organizations distribute food to needy families.

Louisiana Farmers' Markets

In 2002, there were 22 farmers' markets in 18 parishes and 62 roadside stands in 32 parishes, according to the Louisiana Department of Agriculture and Forestry. Products and vendors vary, depending upon the area. In some of the markets, consumers can find native wines, cheeses, jams, jellies, and other canned and baked items. They can also buy seasonal produce such as greens, muscadines, strawberries, sweet potatoes, citrus fruits and pecans. Fresh seafood, poultry and eggs, and homemade sausages are available at some markets along with plants, herbs and fresh flowers.

In New Orleans, the Crescent City Farmers' Market offers cooking demonstrations by local restaurants. Educational programs and exhibits by parish extension agents with the

FARMERS' MARKETS

Lawrence and Carol E. O'Neil

Photo by Mark Claesgens

LSU AgCenter have become a regular part of the market. The Crescent City Market attracts more than 1,500 shoppers each week to the year-round market in three locations.

In Baton Rouge, the Red Stick Farmers' Market celebrated its sixth anniversary by becoming a part of the grand opening of the Main Street Market in the downtown area. This market is sponsored by the Baton Rouge Economic and Agricultural Development Alliance (BREADA). Counted among BREADA's community partners is the LSU AgCenter. Local and state extension personnel as well as volunteer Master Gardeners support the market through educational demonstrations, special programs and exhibits.

Comments from Consumers

Research on farmers' markets in Louisiana was conducted through a qualitative study to determine consumers' and producers' perceptions of farmers' markets. Consumers and producers were interviewed at local farmers' markets. Questions focused on availability of foods, comparison of prices, economic impact, regional differences and seasonal differences. Other questions posed included why people patronize the markets and why farmers vend there.

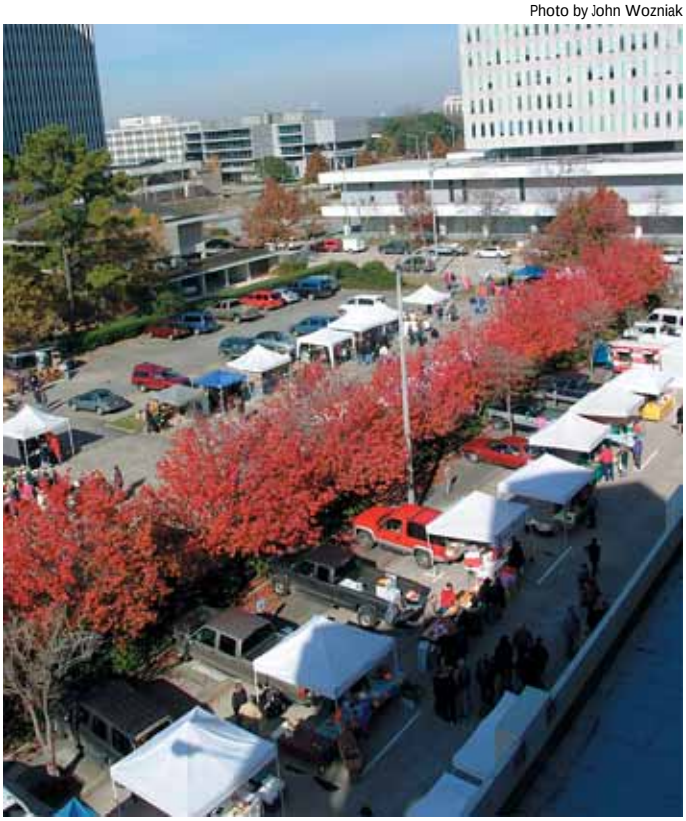
Of the 25 consumers interviewed, most were attracted to farmers' markets because of the freshness of the produce and the special color and camaraderie typical of open-air markets. Consumers said they buy what they feel like eating or what looks good, rather than what has been planned. The predominance of perishables at a farmers' market may contribute to this transitory and impulsive shopping style. Most customers purchase from six or fewer vendors.

Examples of consumer remarks include: "This is a lot more fun than a supermarket," "You meet everybody," "There is a trust here that you don't have in stores," "The atmosphere is fun and friendly," "I love the freshness of the produce," "You can't find these products in the local grocery store," "Prices are sometimes higher, but for the quality, it's worth it" and "You get used to the vendors and can order ahead."

Of the 25 producers interviewed, most were satisfied with the farmers' markets and agreed that the marketplace had been profitable for them, especially the small business owner. Few producers reported that they had problems with consumers haggling over the price; stated prices generally remained firm. Offering free samples of products and sharing recipes attracted customers. Some had quantity discounts, depending upon the product being sold.

All vendors who offered food items said they are continually adding to their product lines or revising recipes for improvement. Farmers with seasonal produce reported that consumers shop according to the season and come to expect a good variety all year long. Remarks from vendors included: "It's great for the small business owner," "I am very satisfied with the market," "It has been very profitable for me" and "I like to offer free samples when I can." ■

Photo by John Wozniak



The Red Stick Farmers' Market is located outside a new shopping area in downtown Baton Rouge, La.

Reducing Roundup Drift

James L. Griffin, Jeffrey M. Ellis, Curtis A. Jones, Jonathan D. Siebert, Eric P. Webster and Steven D. Linscombe

Roundup and other glyphosate-containing products are nonselective, postemergence herbicides that control many annual and perennial weeds. Roundup was initially evaluated in the South for preplant weed control in reduced tillage systems, but the role has expanded with the development of herbicide-resistant crops. The glyphosate-resistance (Roundup Ready) gene was introduced in the United States in soybeans in 1996 and in cotton in 1997.

In 2002, about 80 percent of the soybean and 85 percent of the cotton acreage in Louisiana were planted with Roundup Ready varieties. Because of the diversity of crops grown in Louisiana, it is not uncommon for Roundup Ready crops to be planted near Roundup-sensitive crops. Consequently, the potential for herbicide drift is of great concern. In recent years complaints about Roundup drift have increased.

Most agricultural chemicals used to control pests are liquids sprayed onto plants. Conversion of a liquid into spray droplets and the ultimate fate of the droplets depend on nozzle type, spray pressure, droplet size and environmental conditions. Drift occurs when herbicides are applied under windy conditions or when temperature inversions exist. During a temperature inversion, a layer of air forms at the soil surface that is cooler than the air in the immediate atmosphere. This layer of air captures fine spray droplets that disperse with wind. Temperature inversions are most common at dawn, dusk and when there is no air movement.

Research has shown that off-target movement of herbicides can be somewhere between 1/10 and 1/100 of the applied rate. Even though these rates may be considered sublethal, the response can be quite severe for susceptible crops.

James L. Griffin, Professor, and Jeffrey M. Ellis, Curtis A. Jones and Jonathan D. Siebert, all current or former Research Associates, and Eric P. Webster, Associate Professor, Department of Agronomy, LSU AgCenter, Baton Rouge, La.; and Steven D. Linscombe, Director, Southwest Region, Crowley, La.

In previous research, drift was simulated by varying herbicide rate with application in a constant spray volume. Although this approach provides an estimate of crop response to the herbicide, it does not simulate what happens under field conditions. In the field, drift from aerial or ground equipment would decrease with movement downwind from the point of application. As water in the spray solution evaporates, the remaining spray droplets would become more concentrated with herbicide and the surfactant. The degree of water evaporation would depend on several variables, which include relative humidity and temperature.

To reduce the potential for drift, herbicide should not be applied when conditions are conducive to off-target movement. However, this is easier said than done, particularly when farm management operations are large and timely herbicide application is critical to weed control. Nozzle selection and droplet size play a critical role in drift management. Use of air induction nozzles (also known as venturi nozzles) and other drift-reducing nozzles may help to minimize herbicide drift potential. However, because of the larger droplet produced by some of the nozzles, weed control with Roundup may be compromised.

Simulated Drift Studies

Field experiments were conducted to evaluate response of Cypress rice, Dekalb 687 corn, Delta Pine 33B cotton and DPL 3588 soybeans to simulated drift of Roundup Ultra. Each of the crops was managed using recommended practices, and plots were maintained weed free so weed competition was not a limiting factor to yield. The two variables in the studies for each crop were herbicide rate and application timing. A nontreated control was included for comparison.

Drift rates of Roundup Ultra affected yields of rice and corn but not cotton or soybeans. A 4-ounce rate of Roundup Ultra applied to 2-3 leaf rice reduced yield 83 percent (Table 1), compared to a 2-ounce rate that reduced yield 15 percent. Application to 2-3 tiller rice reduced yields as much as 42 percent.

When Roundup Ultra was applied to 6-leaf corn, yield was reduced 78 percent for the 4-ounce, 43 percent for the 2-ounce and 22 percent for the 1-

Table 1. A summary of crop yield response to Roundup Ultra in simulated drift studies conducted in Louisiana.

	Percent yield reduction vs. no Roundup Ultra								
	Rice		Corn		Cotton			Soybean	
Roundup Ultra rate[a]	2-3 leaf	2-3 tiller[b]	6 leaf	9 leaf	2-3 leaf	Pinhead square	Early bloom	2-3 trifoliate	First bloom
oz per acre	% reduction								
4.0	83	42	78	33	0	6	0	8	9
2.0	15	32	43	0	0	0	0	9	7
1.0	6	6	22	5	5	0	0	3	0
0.5	6	7	8	0	0	0	0	9	3
0.25	4	7	4	7	0	0	5	5	9

[a]*Rates correspond to 12.5%, 6.3%, 3.2%, 1.6% and 0.8% of the labeled rate of 32 oz per acre of Roundup Ultra. All treatments applied in 15 gallons per acre spray volume.*
[b]*Panicle differentiation (initiation of reproductive stage).*

ounce rates (Table 1). When application was delayed to 9-leaf, corn yield was reduced as much as 33 percent.

Cotton maturity was not delayed by drift rates of Roundup Ultra. Some early season injury to cotton and soybeans was observed, but plants were able to recover rapidly and yields were not affected (Table 1).

Spray Volume Studies

Field experiments were conducted to further evaluate Dekalb 687 corn and DPL 3588 soybean response to Roundup Ultra drift. Drift rates represented 12.5 percent and 6.3 percent of the use rate of 32 ounces per acre of Roundup Ultra. The other factor was spray volume. Rates for each herbicide were applied in a constant spray volume of 25 gallons per acre and in proportional spray volumes of 3.1 gallons per acre for the 12.5 percent rate and 1.6 gallons per acre for the 6.3 percent rate. The proportional carrier volumes were selected to evaluate changes in the ratio of herbicide to water in the spray solution that could occur under field conditions downwind from the application site. Only two rates of each herbicide were evaluated because of the difficulty of obtaining spray volumes below 1.6 gallons per acre with the equipment used. A nontreated control was included for comparison.

Table 2. Corn and soybean yield response to Roundup Ultra rate and spray volume in simulated drift studies conducted in Louisiana.

		Percent yield reduction vs. no Roundup Ultra	
Roundup Ultra rate[a]	Spray volume[b]	Corn (6 leaf)	Soybean (2-3 trifoliate)
oz per acre	gallons per acre	% reduction	
4	25	64	18
4	3.1	96	14
2	25	21	9
2	1.6	88	11

[a]Rates correspond to 12.5% and 6.3% of the labeled rate of 32 oz per acre of Roundup Ultra.
[b]The constant spray volume was 25 gallons per acre and variable spray volumes, adjusted proportionally with simulated drift rate, were 3.1 and 1.6 gallons per acre for the 12.5% (4 oz) and 6.3% (2 oz) rates, respectively.

When Roundup Ultra was applied at 4 ounces per acre, corn yield was reduced 64 percent when the spray volume was 25 gallons per acre but was reduced 96 percent for the same rate when applied in 3.1 gallons per acre (Table 2). When the 2-ounce per acre rate was appliced, the corn yield was reduced 21 percent when spray volume was 25 gallons per acre but was reduced 88 percent when applied in 1.6 gallons per acre.

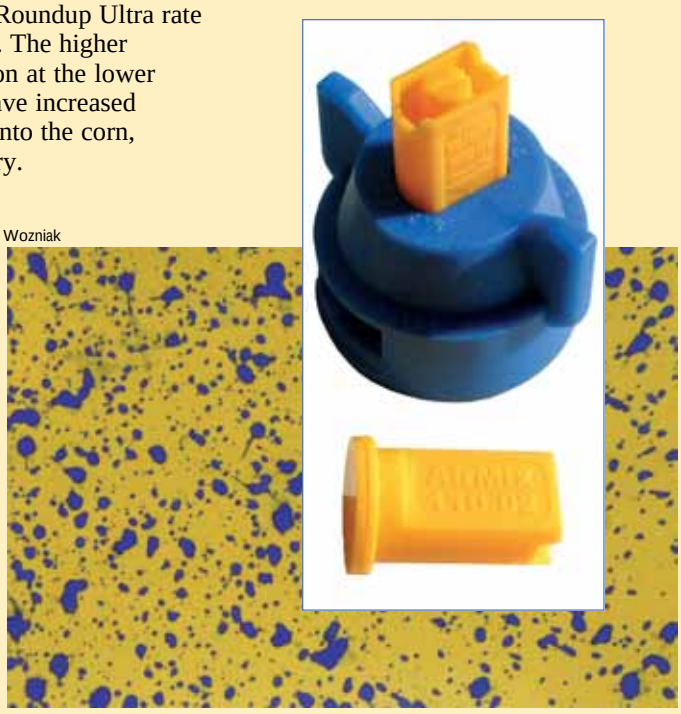
A possible explanation for the differences may be related to spray droplet number and herbicide and surfactant concentration in individual spray droplets. For the 3.1 and 1.6 gallon per acre spray volumes, spray droplets would have been more concentrated with herbicide and surfactant compared to the 25 gallon per acre spray volume, even though Roundup Ultra rate per acre was the same. The higher surfactant concentration at the lower spray volumes may have increased uptake of glyphosate into the corn, resulting in more injury.

Yield reductions for soybeans were no more than 18 percent, and differences among spray volumes for the Roundup Ultra rates were not detected (Table 2).

Results clearly showed, as was the case in the simulated drift study, that corn is very sensitive to Roundup Ultra. Additionally, the spray volume study indicates that results from traditional simulated drift research, in which dose response is evaluated using a constant spray volume, do not represent what occurs under field conditions and may actually underestimate yield reductions. These findings help explain why field observations of Roundup drift in Louisiana show that crop injury at sublethal rates is greater than what has been observed in our simulated drift and constant spray volume studies.

Photos by John Wozniak

This is an XR TeeJet conventional nozzle with spray droplet size and coverage shown on a water-sensitive card. These small droplets are very prone to drift.



This is a Greenleaf AirMix nozzle. Note the larger spray droplet size and coverage on a water-sensitive card. These large spray droplets are less prone to drift.

Drift-reduction Nozzles

Weed control and drift potential were compared for several types of nozzles using Roundup Ultra in spray volumes of 1.5 to 25 gallons per acre at manufacturer recommended spray pressures. Specific information on the spray nozzles evaluated is presented in Table 3. The performance of the Spraying Systems XR TeeJet standard flat fan nozzle that produces very small spray droplets prone to downwind movement was compared with that of drift-reducing nozzles designed to produce larger spray droplets.

The DG TeeJet has a pre-orifice inside the nozzle that reduces internal operating pressure, producing a coarse spray with large droplets. The Turbo TeeJet (flooding-type nozzle) has a turbulence chamber inside the nozzle, providing a coarse spray. The air-induction nozzles (Greenleaf TurboDrop, Greenleaf TurboDrop XL, Greenleaf AirMix and AI TeeJet) each have two orifices, one to meter liquid flow, the other, somewhat larger, to form the spray pattern. In between these two orifices is a jet used to draw air into the nozzle body. In the body of the nozzle, air mixes with liquid, and the resulting spray is low pressure with large, air-filled droplets less prone to drift.

Spray droplet size and spray coverage detected on water-sensitive cards varied among the nozzles evaluated (see photos). The larger spray droplets were noted where the air-induction nozzles were used. Application of Roundup Ultra using the drift-reducing nozzles (air induction along with DG TeeJet and Turbo TeeJet) in a spray volume of 10 gallons per acre provided weed control equal to that of the standard XR TeeJet nozzle.

The Turbo TeeJet and Greenleaf AirMix nozzles were equally effective in controlling weeds using Roundup Ultra in spray volumes of either 3 or 8 gallons per acre, and control was no less than that obtained with the XR TeeJet nozzle at 10 gallons per acre. There were, however, significant reductions in weed control when the spray volume, regardless of spray nozzle, was reduced below 3 gallons per acre.

Table 3. Comparison of spray nozzles for use in herbicide application.

Nozzle type/ specific nozzle	Drift reduction potential	Operating pressure (psi)	Comments
Conventional Nozzles			
XR TeeJet	No	15-60	Very prone to drift
DG TeeJet	Yes	30-60	Fits spraying system nozzle caps; difficult to clean
Turbo TeeJet	Yes	15-90	Fits spraying system nozzle caps; difficult to clean
Air Induction Nozzles			
Greenleaf TurboDrop	Yes	30-150	Exit nozzle tip can be exchanged; caps fit Spraying Systems Quick TeeJet adaptors
Greenleaf TurboDrop XL	Yes	15-120	Exit nozzle tip can be exchanged; caps fit Spraying Systems Quick TeeJet adaptors
Greenleaf AirMix	Yes	15-90	Fits Spraying Systems nozzle caps
AI TeeJet	Yes	30-100	Special nozzle cap required; insert can be removed for cleaning

In a venturi or air-induction nozzle, such as this Greenleaf TurboDrop nozzle, air is drawn into the nozzle body through a tiny hole on the side and mixes with liquid producing a spray with large, air-filled droplets less prone to drift.

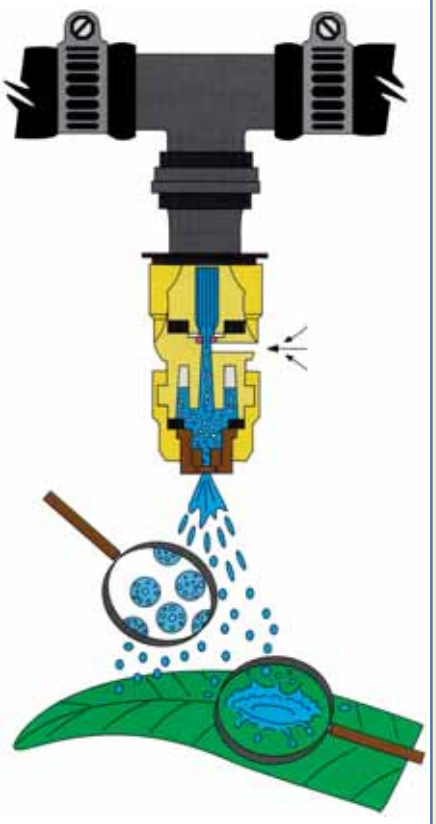


Illustration courtesy of Greenleaf Technologies

Acknowledgment
The Louisiana Soybean and Grain Research and Promotion Board provided funds to support this research.

Spray Nozzles Play Important Role

Results of these studies indicate the negative effect that Roundup Ultra can have on rice and corn when applied at a rate as low as 1 ounce per acre. Roundup Ultra is effective on grasses, which may explain the greater sensitivity of corn and rice. Cotton and soybeans are more tolerant to Roundup Ultra. However, Roundup Ultra at rates higher than evaluated in this research can be detrimental to cotton and soybeans, too.

Spray nozzles can play an important role in drift management. Drift-reduction nozzles produced larger and coarser droplets when compared with the standard nozzle, and weed control with Roundup Ultra was not compromised. Even though in some cases excellent weed control was obtained with Roundup Ultra when applied at a spray volume of 3 gallons per acre, it is recommended that for consistent weed control under variable environmental conditions, spray volume be at least 5 gallons per acre.

There is no substitution for use of common sense when applying Roundup or other glyphosate-containing products around sensitive crops. Regardless of whether or not a drift-reduction nozzle is used, spraying glyphosate under windy conditions or during a temperature inversion will increase the odds of off-target movement and the likelihood of crop damage. Based on our research and from observations in the field, our concern is that though visual injury on both corn and rice caused by Roundup drift may be minimal, the negative effect on yield can be significant. ■

Precision Vegetable Seeders Versus Agronomic Seeders

Regina P. Bracy and Richard L. Parish

An important feature of a precision seeder's performance is its ability to place seeds singularly a given distance apart. Manufacturers of precision vegetable seeders promote their products as more accurate at seeding uniformity than typical agronomic seeders. Based on previous research with vegetable seeders, we decided to compare the seeding uniformity of precision vegetable seeders with agronomic seeders.

For our study we chose the Stanhay model S870 (belt) and Gaspardo SV255 (vacuum) precision vegetable seeders and compared them with the John Deere 7200 MaxEmerge (finger-meter) and Great Plains 8030 (brush-meter) agronomic seeders for seeding uniformity and precision. Each seeder uses a different mechanism for singulating the seed, which provided a basis for comparison of singulation methods. All seeders are well-known brands and readily available to growers.

The seeders were operated over a 20-foot-long greased board at a ground speed of 1.5 miles per hour. Seed spacing measurements were recorded over a center distance of 10 feet. The ground speed was based on manufacturer recommendations for vegetable seeders (to minimize skips that can result at higher plate or belt speeds). Although the ground speed was slower than typically used for most agronomic seeders, all seeders were operated at this speed for consistency in testing and to accommodate the accurate placement of the equipment over the greased board. The board was coated with grease to prevent seed from bouncing and to retain exact placement of the seed.

Soybean seed was used to evaluate the seeders because of its spherical shape and medium size. Based on past seeder research, we know that better seeding uniformity can be expected with spherical seeds. Since the agronomic seeders tested have metering components sized for agronomic crops such as corn, cotton and soybean seeds, we could not realistically expect the agronomic seeders to meter small vegetable seeds such as broccoli or mustard.

Five measurements (mean seed spacing, skips, multiple seed drops, single seed drops and precision of seed spacing) were used to evaluate seeder uniformity. Mean seed spacing is a standard seeder calibration check used by growers and determined by catching the seed while the drive tire is rotated. Multiple seed drops indicated the percentage of seed spacings that had more than one seed dropped in a spot. Skips or missed seed locations were the percentage of spacings where a seed should have been placed but was not. Quality of feed index indicated single seed drops. Precision of spacing indicated the accuracy of the seed placement after omitting the outliers (missed and multiple seed drops). Precision was a measure of the uniformity of spacings classified as singles. Skips, multiple seed drops and single seed drops were measures of singulation.

Mean seed spacing for all seeders was close to the spacing expected but did not give an accurate indication of seeder uniformity. Although not considered a valid measure of uniformity by the authors, mean is the only measure a grower can readily use to determine seeder performance. This measure was included to illustrate the fallibility of the typical seeder calibration checks (catching the seed while the drive tire is rotated) used by growers for determining seeding uniformity of the seeder.

Skips were lowest with the Stanhay (4 percent) and John Deere (8 percent) seeders (Table 1). The Stanhay belt seeder also had the lowest percentage of multiple seeds per drop and highest single seed drops. Although Stanhay had the best precision (seed spacing uniformity of single seed drops), precision was not considered acceptable for any seeder tested.

The Stanhay vegetable seeder had the best seeding uniformity and precision spacing of all the seeders tested. The Gaspardo vegetable seeder and the John Deere agronomic seeder were comparable in seeding uniformity and precision although fewer skips were noted with the John Deere. The Great Plains agronomic seeder, which is not designed to be a precision agronomic seeder, had a high number of skips and multiples and poor seeding precision.

Precision and uniformity varied with the seeder tested. Seeding uniformity was good with one vegetable seeder (Stanhay) and fair with the other (Gaspardo). Uniformity with the agronomic seeders was fair with the John Deere but unacceptable with the Great Plains. If medium to large spherical seed (such as peas and beans) are being planted, adequate seeding uniformity can be obtained with an agronomic seeder such as the John Deere MaxEmerge. When planting small vegetable seed or irregularly shaped seed, growers would obtain better uniformity and less waste of expensive vegetable seed if they used a belt seeder specifically designed for vegetable crops. ■

Table 1. Seeding uniformity of selected agronomic and vegetable seeders using soybean seeds.

Seeder	Spacing inches	Mean inches	Skips (%)	Multiple seed drops (%)	Single seed drops (%)	Precision (%)
Stanhay	1.9	1.8	4	5	90	22
Gaspardo	3.0	2.8	14	23	62	28
John Deere	3.8	3.1	8	29	63	26
Great Plains	1.0	1.0	23	38	38	28

Regina P. Bracy and Richard L. Parish, Professors, Hammond Research Station, Hammond, La.

Recommended rates of trifluralin affect direct-seeded cabbage stands

Regina P. Bracy and Richard L. Parish

Difficulty in obtaining and maintaining an adequate stand in direct-seeded cabbage led to the investigation of possible culprits such as herbicides, insects and diseases. We hypothesized that use of Treflan (trifluralin) during periods of high soil temperature and low soil moisture would reduce germination and seedling vigor.

A series of experiments was conducted evaluating the effect of trifluralin (Treflan 4E) at rates of 1/2, 3/4, 1, 1 1/2 , 2 pints per acre on cabbage. The recommended rate for fine sandy loam soils in this area is 1-1 1/2 pints per acre.

Regina P. Bracy and Richard L. Parish, Professors, Hammond Research Station, Hammond, La.

Photo by John Wozniak

Especially on light-textured soils, producers should not use more than ¾ pint per acre of trifluralin on direct-seeded cabbage or reduced stands can be expected.

The herbicide was applied to prepared, weed-free beds and incorporated into the top 2 inches of soil before seeding cabbage. The cabbage was seeded into twin drills on a 48-inch bed with a Stanhay belt seeder. Seed spacing was nominally 8 inches apart.

To determine if the herbicide was causing injury to the seedlings, activated charcoal was used to neutralize the harmful effects of the trifluralin herbicide applied at the higher rates of 1 1/2 and 2 pints per acre. Activated charcoal as a slurry was sprayed at the rate of 300 pounds per acre directly into the seed furrow (after seed drop but before seed covering).

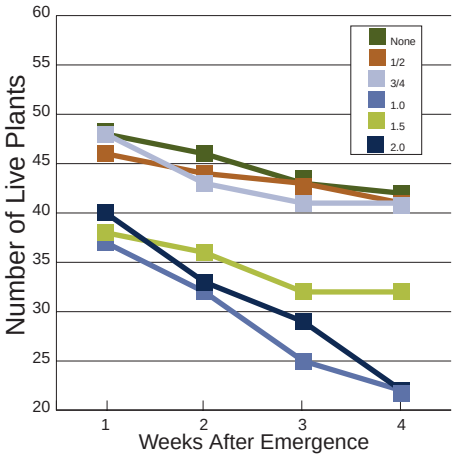
Half of the planted area was irrigated with overhead sprinklers, and the other half was irrigated with furrow irrigation immediately after planting. Weekly counts of live cabbage plants were made after seedlings had emerged (ground crack). Weed counts of grass, broadleaf and sedge weeds were taken about eight weeks after planting from a representative section of each plot.

Herbicide rate did not have a significant effect on plant stands when furrow irrigation was used. However, when plots were sprinkler-irrigated and treated with trifluralin at the higher rates of 1, 1 1/2 and 2 pints per acre, significantly fewer cabbage plants were recorded one, two, three and four weeks after emergence than on plots treated with zero or 1/2 or 3/4 pints per acre of trifluralin (Figure 1). Treating the plots with 1/2 or 3/4 pint per acre of trifluralin did not reduce the plant numbers compared with using no herbicide.

More plants were noted on the plots where activated charcoal was applied to the seed furrow before planting even though high rates of trifluralin also were applied (Figure 2). Since charcoal neutralizes herbicide effects, these results verify that plant losses were caused by increasing trifluralin rates.

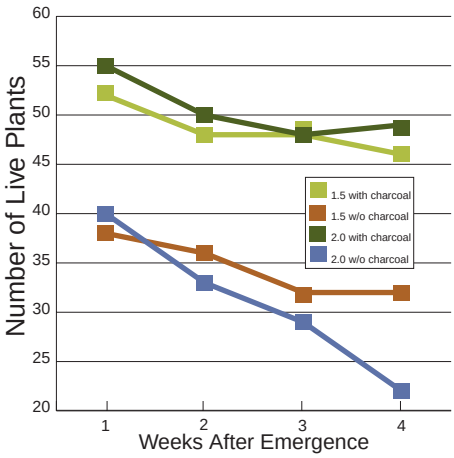
Control of grass, broadleaf and sedge weeds was similar with the use of 1/2 and 3/4 pints per acre of trifluralin as it was in plots receiving the higher rates of 1, 1 1/2 and 2 pints per acre. Using no herbicide on the plots resulted in higher numbers of grass and broadleaf weeds.

Figure 1. Effect of trifluralin rates on directly seeded cabbage stands.



Since plant losses were less and weed control was as good with the lower rates of trifluralin, LSU AgCenter recommendations for trifluralin rates for cabbage have been reduced from the labeled recommendation of 1-1 1/2 pints per acre to 3/4 pint per acre. Especially on light-textured soils, producers should not use more than 3/4 pint per acre of trifluralin on direct-seeded cabbage or reduced stands can be expected. ■

Figure 2. Effect of trifluralin rates and charcoal on directly seeded cabbage stands.



Reusing black polyethylene mulch saves money in vegetable business

H.Y. Hanna, Richard L. Parish and Regina P. Bracy

Photos by H.Y. Hanna

Thousands of acres of vegetables and strawberries are planted every year in the southern United States on black polyethylene-mulched and drip-irrigated beds. Black mulch increases early spring crop yield by retaining heat and moisture, conserving fertilizer and retarding weed growth.

Because the long growing season in the South offers the potential for double-cropping of existing mulched and drip-irrigated beds, many growers would like to produce a second crop such as cucumbers, muskmelons and squash following tomatoes, peppers or strawberries. The practice of double-cropping reduces production costs by enabling succeeding crops to use the existing polyethylene mulch, drip tape and fertilizers applied to the first crop. In Florida, cost analysis of this practice indicated that savings were ample enough to justify double-cropping watermelon behind tomatoes.

The color of polyethylene mulch influences the microclimate around the root system. Black polyethylene mulch is preferred for growing winter and early spring crops because of its warming effect on the soil around the roots. However, heat accumulation under the black mulch during sunny days in mid to late summer following crop removal is thought to limit its use for a succeeding crop. To prevent heat buildup, some growers paint the black polyethylene with white latex paint, and some researchers recommend using a mulch system that changes color from black to white at the termination of the tomato crop and before planting a summer crop.

Red River Studies

Eight studies were conducted at the Red River Research Station to determine if black mulch used in spring tomato production would adversely affect growth and yield of subsequent cucumber and muskmelon crops. For valid comparison, tomatoes were planted on an equal number of black and white mulched beds in early April. The same beds were used for cucumber and muskmelon studies after the termination of the tomato crop in late June.

Figure 1. Cucumber plants were trained vertically using existing tomato stakes for support and fertilized by injecting nitrogen at 12.5 pounds per acre (37 pounds of ammonium nitrate) through the drip-irrigation system when the plants reached the third-leaf stage.

Figure 2. Cucumbers were harvested three times each week and fruit were graded according to U.S. Department of Agriculture (USDA) standards to U.S. Fancy, No. 1, No. 2 and culls.

H.Y. Hanna, Professor, Red River Research Station, Bossier City, La.; Richard L. Parish and Regina P. Bracy, Professors, Hammond Research Station, Hammond, La.

Following plant removal after the last harvest of tomatoes, plots were sprayed with glyphosate at 3 pounds active ingredient per acre to kill existing vegetation and expose the mulched plots to sunlight. Cucumbers were planted in July and August of 1994, 1995 and 1996 (six studies) and muskmelons were planted in July of 1996 and 1997 (two studies). Soil temperature under both black and white polyethylene mulch was recorded at a 4-inch depth around 4 p.m. at the center of each row for three weeks, and the average temperature was calculated.

Cucumber plants were trained vertically using existing tomato stakes for support (Figure 1) and fertilized by injecting nitrogen at 12.5 pounds per acre (37 pounds of ammonium nitrate) through the drip-irrigation system when the plants reached the third-leaf stage. Two more applications of equal amounts were made at three-week intervals following the first application. Muskmelons were planted on tomato beds after removing tomato stakes and fertilized by injecting 15 pounds per acre of nitrogen (45 pounds of ammonium nitrate) through the drip irrigation system at the third-leaf stage and again three weeks later.

Cucumbers were harvested three times each week (Figure 2) and fruit were graded according to U.S. Department of Agriculture (USDA) standards to U.S. Fancy, No. 1, No. 2 and culls. Marketable yield was the sum of all grades except culls. Muskmelons were harvested nine times in 1996 and seven times in 1997, evaluated for grade and then weighed. Fruit that were well formed, well netted and free from decay, damage and sunscald were graded as marketable. Fruit that were deformed, cracked, rotten, or weighed less than a pound were culled.

Study results indicated that soil temperatures were higher under black than under white mulch in all tests. Marketable yields of cucumbers planted in July and August of 1994, 1995 and 1996 were not affected significantly by color of the mulch. Mulch color had no significant effect on muskmelon marketable yield either (Table 1).

Photo by John Wozniak

Squash studies were conducted at the Hammond Research Station in 2000 and 2001. In these studies, squash was mulched with black and white polyethylene mulch and with black mulch painted white at several paint rates.

Squash Studies

Squash studies were conducted at the Hammond Research Station in 2000 and 2001. In these studies, squash was mulched with black and white polyethylene mulch and with black mulch painted white at several paint rates. The paint was applied to the first study and a crop of squash planted in April 2000. Additional tests were planted in August 2000 and May 2001 on plastic that was painted in August 2000. Results indicated that there was no consistent yield advantage to white or white-painted plastic over unpainted black plastic (Table 1).

Results of these studies indicate that concerns over reusing black plastic mulch for a second crop are unfounded. Growth and yield of cucumbers and muskmelons were similar when planted on black or white polyethylene mulch. Squash yields on black and white painted mulch were also similar. ■

Table 1. Effects of black vs. white mulch on soil temperature, marketable yields (pounds/acre) of cucumber, muskmelon and squash planted as a second crop.

	Average temperature (F)		Cucumber yield		Muskmelon yield		Squash yield	
	Black	White	Black	White	Black	White	Black	White
July 94	93.2	90.9	38175	40049				
Aug 94	89.4	86.4	13290	13201				
July 95	96.4	92.1	36302	38354				
Aug 95	97.2	94.8	31664	31575				
July 96	92.8	89.6	40673	43349	38354	35678		
Aug 96	92.3	89.1	28275	27026				
July 97					35946	34162		
April 00							14240	16530
Aug 00							13680	15240
May 01							19850	21390

Average temperature for all tests was about 3 degrees F higher under black than under white mulch. Black and white mulch had no significant effect on yield of each crop.

Efficacy of PCNB for the Management of Southern Blight in Fresh Market Tomatoes

Patrick D. Colyer and Philip R. Vernon

Southern blight, caused by the fungus *Sclerotium rolfsii*, is a serious disease that attacks many plant species, including most vegetables grown in home gardens. The most obvious symptom of the disease is the sudden wilt or collapse, near or at mid season, of all the above-ground parts of the plant (Figure 1). The mycelium of the fungus is often visible as a white, cottony growth around the base of the stem near the soil line (Figure 2). Reddish-brown sclerotia, which are survival structures of the fungus, are often present in this mass of mycelium.

Photos by Patrick Colyer

Figure 1. Complete collapse of tomato plant with southern blight.

Figure 2. Fungal growth of *Sclerotium rolfsii* around the base of an infected tomato plant.

The disease is difficult to manage, and all control practices are directed at preventing infection. Crop rotation and the application of the fungicide pentachloronitrobenzene (PCNB) to transplants are recommended to reduce the incidence of the disease. There are numerous reports, however, that the application of PCNB has failed to protect the plants from the disease. In 1998 and 1999, a study was conducted to evaluate the effect of the application of the PCNB (Terraclor 75WP) on the incidence of southern blight and yield of tomatoes grown on plastic mulch with drip irrigation. Transplants not treated with the fungicide were compared with transplants that were dipped in a suspension of the fungicide (3 pounds in 100 gallons of water) before planting into the black plastic mulch. There were 10 transplants per plot planted 18 inches apart and four replications of each treatment.

The incidence of southern blight was recorded weekly starting in mid-June through crop termination in mid- to late July by counting the number of infected plants (Figure 3). Infected plants were distinguished by wilted foliage and the presence of mycelium around the base of the plant. Except for the early rating dates when the incidence of disease in all plots in the test was less than 10 percent, the incidence of southern blight was lower in the fungicide-treated plots on every planting date. At the termination of the test each year, more than 60 percent of the plants were killed by southern blight in plots not treated with fungicide compared with less than 25 percent in plots treated with a fungicide at planting. Consequently, although complete control of the disease was not achieved, incidence of the disease was lower in fungicide-treated plots.

Although premium and marketable yields or numbers of fruit were higher in the fungicide-treated plots, the differences between treatments were not significant (Figure 4). The failure to improve yields, despite the differences in plant survival, is related to the number of fruit that had to be culled. The surviving plants in the fungicide-treated plots continued to produce fruit, but many had to be culled because of insect injury and because high temperatures caused cracking. ■

Patrick D. Colyer, Professor, and Philip R. Vernon, Research Associate, Red River Research Station, Bossier City, La.

Figure 3. Incidence of southern blight over time for tomato plants treated with PCNB or untreated in 1998 and 1999.

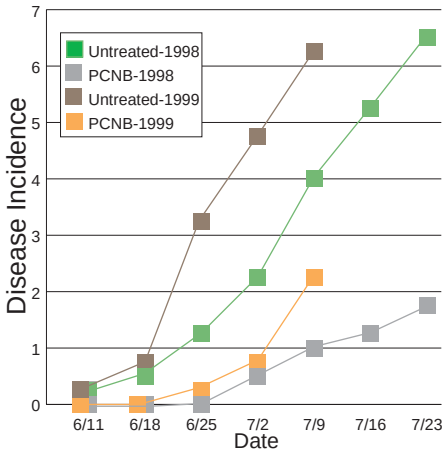
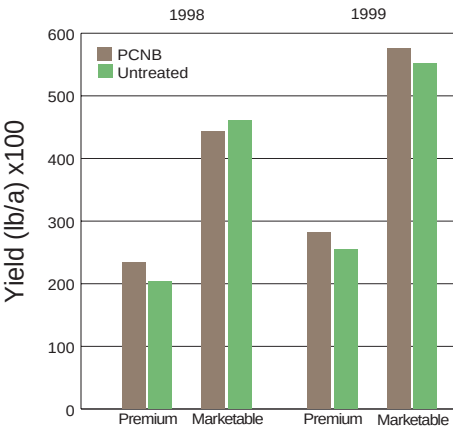


Figure 4. Premium and marketable yield of tomato plants treated with PCNB or untreated in 1998 and 1999.



Off-flavor in Pond-cultured Catfish

Pecan Waste May Help Control

Chilton Ng, Jack Losso, Wayne E. Marshall and Ramu M. Rao

Photo by John Wozniak

One of the problems that catfish farmers face is the development of off-flavor in the fish, which is caused by a substance called geosmin.

Off-flavor in pond-cultivated catfish is a problem for Louisiana catfish producers. One of the compounds most commonly cited as responsible for earthy and musty tastes and odors in water and the cause of off-flavor in catfish is geosmin, which is a substance produced by blue-green algae and bacteria. Although it is not a health hazard, geosmin in water can be absorbed in fish tissue, making fish taste bad and impossible to sell.

Conventional separation techniques for removing geosmin have been unsuccessful, because it is an extremely stable compound. It resists chemical oxidation and heat and is not significantly affected by chlorination. Consequently, the most common water treatment processes have little effect on it. Coal-based powdered activated carbon has been used at water treatment plants to remove geosmin, but this process can be a significant added expense when used continuously.

LSU AgCenter research has found that sugarcane bagasse and pecan shell-based granular-activated carbons (GACs) hold promise as lower cost replacements for coal-based commercial carbons. Laboratory experiments were conducted in which the physical and chemical properties of pecan-based GACs and bagasse-based GACs were compared with a commercially available coal-based product. See Table 1. The pecan shell-based material that was steam-activated matched most closely to the commercial carbon, Filtrasorb 400.

In 2001, 16 million pounds of pecans were grown in Louisiana. This resulted in the generation of an estimated 8 million pounds of pecan shells as byproducts with little economic value to the Louisiana economy. Using this agricultural byproduct as feedstock for activated carbon production, besides solving an environmental problem, would turn it into a valuable commodity. Furthermore, using nutshells to produce granular-activated carbons provides a less expensive raw material than coal.

On the basis of the physical, chemical and adsorptive properties of GAC, LSU AgCenter research indicates that pecan shell-based carbons prepared with steam hold promise as a replacement for commercial coal-based carbons in the removal of geosmin from water. The experimental results have shown the effectiveness of byproduct-based GACs in adsorbing geosmin in a laboratory environment. It was assumed that off-flavor in pond-raised catfish could be reduced by removing geosmin from the pond water. Further studies are warranted to test these carbons as part of filtration units designed to recycle catfish pond water to remove geosmin. ■

Table 1. Physical and chemical properties of coal-based and agriculture byproduct-based activated carbon.

	Physical Properties			Chemical Properties	
	Surface Area	Bulk Density	Attrition	pH	Ash
	(m^2/g)	(g/ml)		(%)	(%)
				Coal-based	
Filtrasorb 400	1000	0.44	10.8	7.9	8.3
				Agricultural byproduct-based	
Pecan Shell-based Steam-activated	810	0.45	10.1	12.2	5.0
CO_2-activated	474	0.56	4.1	11.7	5.7
Phosphoric Acid-activated	911	0.51	2.9	3.7	1.5
Sugarcane Bagasse-based Steam-activated	565	0.10	93.0	6.1	25.0

Except for surface area, values represent the average of two to three samples

Chilton Ng, Graduate Student, and Jack Losso, Assistant Professor, Department of Food Science, LSU AgCenter, Baton Rouge, La.; Wayne E. Marshall, USDA-ARS, Southern Region Research Center, New Orleans, La.; and Ramu M. Rao, Professor, Department of Food Science, LSU AgCenter, Baton Rouge, La.

LSU AgCenter builds site to test wood products for termite resistance

LSU AgCenter scientists are gearing up to participate in the search for alternatives to termite-preventing wood treatments. The search has become critical because the most predominate treatment – chromated copper arsenate, also known as CCA – soon will be taken off the market.

The U.S. Environmental Protection Agency (EPA) has determined CCA is too dangerous to use, said Gregg Henderson, entomologist long involved with research on termites.

"This has created a void of products that can replace it adequately," Henderson said.

Anticipating that chemical and wood treatment companies will need research assistance, the LSU AgCenter is establishing a termite research site at its Citrus Research Station at Port Sulphur to evaluate new wood treatments.

"It's the only one in the continental United States," Henderson said of the site, adding that a similar project is being conducted in Hawaii.

To test woods for termite resistance, Gregg Henderson uses milk crates which he fills with 44 sticks of wood 1 inch high by 1 inch wide by 12 inches long. He then buries the crates in an area known to be infested by Formosan subterranean termites.

Photos by Mark Claesgens

When the crates used in the research project are dug up, the soil and wood inside are filled with Formosan subterranean termites.

"We needed a field site with natural Formosan subterranean termite colonies," Henderson said. "We don't want to bring termites to someplace they haven't already infested."

Henderson said the area around Port Sulphur in Plaquemines Parish is one of the heavier infested parts of the state because it's near the Mississippi River and near the port areas where the Formosan subterranean termites originally came into the country in shipping containers from the South Pacific after World War II.

"Our selection criteria included having termites already in the area, security for the experiments and a long-term guarantee that the research would continue," he said.

Henderson said the 10-acre site selected for the research project is a safe distance from buildings and potential construction so researchers don't have to worry that the insects will move to other structures.

The area has no street lights to lure flying termites that swarm every spring looking for places to establish new nests.

"We can put up lights and keep them in the area," he said.

Henderson said the project involves collecting termites and then bringing them to the research site, where they are exposed to a variety of wood samples treated with different chemicals.

The researchers begin by filling plastic milk crates with sticks of wood and burying them in an area known to be infested by Formosan subterranean termites. When the crates are later dug up, the soil and wood inside are filled with the little critters.

"We've collected as many as 60,000 termites in a crate in one week," Henderson said.

At the research site, the crates are buried in the center of a series of 16-foot-long pieces of 2-by-4 lumber that radiate out from the center, the entomologist said. The longer pieces of lumber serve as pathways for the termites to travel to different wood samples placed beside them.

After luring the termites to different samples, the scientists will evaluate how well the different treatments work.

"We want to develop strategies to control the termites," Henderson said. "Our goal is to keep them away from the food source, to either kill or repel them with wood treatments."

Negotiations are under way with chemical companies and wood processors to support the research with grants and payments for evaluating their products. ■ **Rick Bogren**

Scientists work to keep salvinia, hydrilla at bay

Sometimes uninvited guests just don't know when to leave. That's the case with two invasive plants in the state, giant salvinia and hydrilla. But LSU AgCenter scientists are trying to give the eviction notice to these two aquatic weeds with herbicide and biological controls.

Entomologist Seth Johnson is working on a biological control for giant salvinia. He is rearing the salvinia weevil in 10 above-ground tanks with each tank holding 100-200 weevils. When the weevils reach the adult stage, he releases them (250 at a time) in infested areas. He has made releases at two sites in Louisiana: Toledo Bend Reservoir and in Cameron Parish.

"Both areas are showing damage," Johnson said. "What you will see is the salvinia actually turn brown from the weevil feeding on the buds of the plant and the larvae tunneling into the rhizomes."

Over time the salvinia will die and sink. The weevils are placed in 1-meter square containment areas. Johnson says this is done to mark the release point but the weevils can move outside these areas.

After giant salvinia was discovered in Cameron in 2001, larvae of the salvinia weevil were released there in December 2001. When Johnson returned to monitor the progress of the weevils, he found none.

"A hard freeze in early January could have been lethal to the larvae. If they survived, adults could have left the area after it was drained," Johnson said. "There is not a lot of good information on weevil dispersal and exactly how much salvinia they consume. We hope to be able to answer those questions from our research."

Johnson also hopes for efficient production of weevils in a controlled environment. They take five weeks to reach maturity at 80 degrees F with an additional two weeks required before egg laying by a female, and a weevil lays approximately 375 eggs. The weevils have a life expectancy of 16 weeks and lay approximately 23 eggs per week almost continuously during their lifetime.

A confirmed report of giant salvinia near Houma prompted Johnson to seek a permit from the U.S. Department of Agriculture to release the weevils in this area. Johnson expects permission, which can take a while, sometime in 2003.

Herbicide can be used to control giant salvinia, but it is extremely costly. Weed scientist Dearl Sanders is looking for alternative herbicides that kill salvinia, but are more affordable than the diquat formulas.

"I did a single trial using a glyphosate as a replacement herbicide for diquat. It provided better than 90 percent control at 8 pounds of active ingredient per acre. This is a high rate but still less expensive per acre than diquat," Sanders said.

Hydrilla, an invasive species native from South America, has been in Louisiana for quite a while. Efforts to control this nuisance plant have included lake drawdowns, introduction of sterile carp that feed on the plant, and herbicide applications. Sen. Craig Romero of New Iberia helped secure funds to treat Lake Henderson, a popular fishing and tourist destination near Lafayette. Contractors applied Avast! in July and August of 2002 to kill the hydrilla and under the agreement would not be paid until an 80 percent kill rate was achieved.

"It basically starves the plant to death. Avast! inhibits chlorophyll and the plants don't produce food," Sanders said.

At the end of October 2002 a final determination was made with a kill rate of 90 percent.

A big hurdle facing the state is the cost of treating hydrilla. Controlling nuisance weeds such as water hyacinth costs around $8 per acre. Treatment for Lake Henderson costs nearly $100 per acre not including the application costs. With hydrilla present throughout Louisiana, treatment costs would run into the millions.

While it may be impossible to rid the state of all the hydrilla and giant salvinia, herbicides and biological controls can reduce their impact. AgCenter scientists are working on the best methods to accomplish this. ■ **Craig Gautreaux**

Photo courtesy of The Advocate

Photo by Seth Johnson

Photo courtesy of The Advocate

Seth Johnson grows salvinia weevils in his laboratory that he then releases into infested areas to see how effective the insects are in controlling this noxious weed. The weevils were released in the square at left. Note the color difference.

News Briefs

Russell bermudagrass hay proves valuable

Russell bermudagrass hay is proving to be a profitable crop for Rex Wilhite of Ringgold.

Wilhite has been growing this relatively new variety for about six years and says it produces more hay than any variety he's tried.

The Russell variety was developed jointly by researchers in the LSU AgCenter and their counterparts in Alabama and was released in 1994. It has shown excellent performance and is widely used by Louisiana cattle producers for their hay production and pastures.

"I have to cut my fields about four times a year," Wilhite said. "This variety is hardy and produces big leaves."

Wilhite grows about 30 acres of this hay and said he will assist anyone who wants to buy sprigs to grow on their own. He recently won the Louisiana Hay Show, sponsored by the Louisiana Forage and Grassland Council, with his entry of this variety.

"It may not be as productive as some varieties, such as 'Tifton 85' or 'Sumrall 007,' but it is a grass that has good winter hardiness," said Ed Twidwell, LSU AgCenter agronomist. "It also is adapted to all parts of the state."

The feeding value of Russell is equal to most other varieties on the market, and it yields 20 percent to 40 percent more than common bermudagrass, he said.

Growers will benefit from Russell's winter hardiness, because the variety produces an abundance of rhizomes for sprig plantings and also produces long hay that is suitable for planting, Twidwell said.

"This variety produces good first yields and is very well accepted by horse owners," he said.

Wilhite said he follows the LSU AgCenter's recommendations for growing this variety. Recommendations given by Twidwell include planting the Russell variety between March 1 and June 1. For planting with long hay, use about 1,500 to 2,000 pounds of long hay per acre. The number of bales used will depend on the weight of the bales. Follow soil test recommendations for amounts and types of fertilizers to apply.

"Producers will probably need to clip the hayfield for weed control," Twidwell said. "Russell is planted in the spring; therefore, producers normally can expect to produce one cutting of hay by the fall – or possibly do some light grazing with livestock. Production is dependent upon the environmental conditions after planting." ■ **A. Denise Coolman**

Photo by A. Denise Coolman

County agent Noah Washburn and Ringgold hay producer Rex Wilhite take a core sample of a bale of Russell bermudagrass hay to send to the LSU AgCenter's Southeast Research Station for analysis.

LSU AgCenter releases new rust-resistant wheat

A new wheat variety developed specifically for Louisiana growers and adapted to Louisiana and surrounding states has been released by the LSU AgCenter.

The new wheat variety, LA841, will be available to growers by the summer of 2003, said Stephen Harrison, who directs the wheat and oat breeding program. Terral Seed Inc. of Lake Providence, La., has been awarded exclusive license to produce and market the variety as Terral LA841.

Selection and early testing of the wheat variety in Baton Rouge were followed by yield trial evaluations at AgCenter research stations across Louisiana. LA841 has been tested in Louisiana and in surrounding states since 1998, and breeder seed of LA841 was produced at the Macon Ridge Research Station in Winnsboro during the 2001-2002 growing season.

"It's a good locally adapted wheat variety for Louisiana farmers," Harrison said. "It has excellent grain yield and is resistant to leaf rust and stripe rust. It also shows good straw strength and does not have a tendency to head too early and sustain spring freeze injury."

David Boethel, associate vice chancellor, said because the variety's pedigree indicates a different source of genetic resistance to leaf rust than varieties currently grown, it may retain its leaf rust resistance longer.

Studies show LA841 had the lowest leaf rust and stripe rust ratings of 17 varieties from 12 Louisiana test locations in 2001 and 2002. It had an average yield of 74 bushels per acre in these trials – just three bushels per acre lower than the highest yielding entry and equal to the yield of wheat varieties USG 3209 and Coker 9152. ■ **A. Denise Coolman**

LSU AgCenter Fights Mosquito Bites

Teaching young people to be Skeeter Busters was part of the cooperative efforts between the LSU AgCenter and the state Department of Health and Hospitals.

Most people don't think about mosquitoes much during the winter, but LSU AgCenter faculty members aren't like those people.

A group of AgCenter entomologists, extension agents and other faculty members are working intently on projects that could help communities across the state reduce the risks of mosquito-borne diseases this summer.

The work is part of a cooperative effort between the AgCenter and the Louisiana Department of Health and Hospitals. Its basic goal is to establish mosquito abatement districts in Louisiana parishes that don't have them – particularly those parishes hit by West Nile virus outbreaks last summer.

"A lot of people are concerned about mosquito abatement now because of the West Nile virus situation," said David Boethel, associate vice chancellor who oversees mosquito research and educational efforts.

"There are some parishes in the state that have had mosquito abatement programs since the 1960s, but there are a lot of other parishes that don't have them," Boethel said. "The (DHH) Office of Public Health has asked us to develop a model for a comprehensive plan for mosquito abatement."

The plan is an outline being developed so parish officials can adapt it to their individual situations when trying to establish mosquito abatement districts. It addresses such issues as mosquito surveillance, controlling mosquito populations, estimated costs for an abatement program, different methods of funding such programs and public education and outreach.

Officials say parish leaders need a starting point, and that's why DHH is funding the development of the plan – through a contract with the LSU AgCenter.

The latest cooperative ventures between DHH and the LSU AgCenter began this past summer, when DHH funded two AgCenter educational programs on avoiding mosquito-borne diseases and an effort that involved AgCenter faculty and field agents in monitoring of mosquitoes in some parishes.

The monitoring was conducted in 11 Louisiana parishes that didn't have mosquito abatement programs but had been hit by West Nile cases.

Now AgCenter faculty will focus intently on working specifically with officials in those 11 parishes – Allen, Bossier, East Feliciana, Iberville, Livingston, St. Helena, St. Landry, Tangipahoa, Tensas, Washington and West Baton Rouge – concerning potential formation of mosquito abatement projects.

"The template we are developing certainly is going to take into account some of the things we learned from the monitoring program last summer," said Michael Perich, a medical entomologist and the AgCenter's principal expert on mosquitoes.

Perich said experts used three different types of traps and monitored 10 different locations in the 11 parishes involved in the program this summer. The result was the species identification of more than 150,000 captured mosquitoes during the two-month period monitoring was conducted.

"We found 43 out of the 68 species of mosquitoes known to live in Louisiana," Perich said. "Of those, we also identified nine different genera – basically all that are found in the state."

Although the AgCenter's efforts will focus on those 11 parishes, others also will be involved in regional meetings to talk about plans and in efforts conducted by DHH and other partners. ■ **Tom Merrill**

Answer: c) persimmon

Inside:

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