

**Louisiana State University Agricultural Center**

**Annual Report, FY 2003**

**October 1, 2002-September 30, 2003**

**Submitted to**

**USDA-CSREES**

**April 30, 2004**

**Louisiana State University Agricultural Center**

**Annual Report, FY 2003**  
**October 1, 2002-September 30, 2003**

**TABLE OF CONTENTS**

**Annual Report, FY 2003  
October 1, 2002-September 30, 2003**

|  | <b>Page</b> |
|--|-------------|
| Overview.....  | 1           |
| Research Projects.....   | 1           |
| Extension Programs.....  | 3           |
| Goal Summaries   |             |
| Goal 1.....  | 11          |
| Goal 2.....  | 80          |
| Goal 3.....  | 90          |
| Goal 4.....  | 109         |
| Goal 5.....  | 159         |
| Stakeholder Input.....   | 202         |
| Extension Section.....   | 202         |
| Research Section.....  | 203         |
| Merit Review.....  | 204         |
| Program and Project Reviews.....                                     | 206         |
| Evaluation of Multi-State Activities                                 |             |
| Extension Section.....   | 207         |
| Research Section.....  | 207         |
| Integrated Research-Extension Activities.....                        | 208         |
| Integrated Activities.....   | 209         |
| Supplement on Multi-State Extension Activities.....                  | 213         |
| Supplement on Multi-Function Activities (Smith-Lever Act Funds)..... | 217         |
| Multi-State and Multi-Function Briefs.....                           | 218         |

**Louisiana State University Agricultural Center  
Annual Report, FY 2003  
October 1, 2002-September 30, 2003**

## **Overview**

The overall mission of the LSU Agricultural Center is to enhance the quality of life of the people of Louisiana through research and education programs that develop the best use of natural resources, conserve and protect the environment, enhance development of existing and new agricultural and related enterprises, develop human and community resources, and fulfill the acts of authorization and mandates of state and federal legislative bodies.

In realizing this mission, the LSU Agricultural Center's Plan of Work, FY 2000-2004, focused research and education programs under five goals established by USDA-CSREES in pursuance of the mandate of the Agricultural Research, Education, and Extension Reform Act of 1998 (AREERA). Annual reports of research projects and extension programs conducted during FY 2000, FY 2001, and FY 2002 have been submitted. This is the fourth report against the strategic plan covering the fiscal year 2003 (October 1, 2002-September 30, 2003). It updates information about several of the ongoing programs which were included in previous years' reports, and provides information on new initiatives and projects undertaken during FY 2003. Summaries of research projects and extension programs are included under each goal. These summaries are followed by information about the processes used for stakeholder input in and merit review of programs, and allocations of federal appropriations to multi-state and multi-function activities.

## **Research Projects**

The majority of the LAES programs continue to focus on Goal 1. Research to address plant variety development and evaluation, pest management, animal and aquaculture production systems, animal health and biosecurity systems and agricultural economics remain relevant to Louisiana stakeholders.

Variety development and performance evaluations continued on all major row crops, fruits and vegetables, and sweet potatoes. During 2003, a rice variety was released that provides more biomass than traditional rice varieties and is intended for crawfish farmers who raise crawfish only rather than double-crop with rice harvested for grain. LAES researchers along with USDA-ARS scientists, and the American Sugar Cane League jointly released a sugarcane variety that offers more erectness and comparable yield to currently grown varieties. Erect stature increases harvesting efficiency. Performance trials with varieties developed by private industry and other public breeders were conducted at research stations throughout the state. Results from these trials are essential for the variety recommendations that LCES personnel develop for stakeholders. Research on the use of molecular technology to enhance the variety development effort has increased with special emphasis on rice and sugarcane.

Evaluation of experimental pesticides and studies to expand the labels of currently registered products continue to be the focus of LAES scientists in the areas of weed science, crop physiology, plant pathology and entomology. Clearfield rice, a non-transgenic rice resistant to herbicides need to manage a major weed pest (red rice), continued to be adopted by producers during 2003 with good success. Dramatic increases in acreage planted to these varieties are predicted for the 2004 growing season. Classical biological control of several invasive insect and plant species was conducted.

Because animal diseases greatly diminish profitability for producers and because zoonotic organisms pose a human health threat, LAES researchers have launched an effort to develop effective vaccines for prevention of these maladies. The goal of the research is a multivalent vaccine against brucellosis, tuberculosis, and Johne's disease in cattle. Other research demonstrated that in cattle, sperm motility can be used to aid in diagnosis of mitochondrial diseases in that male, his mother, and his mother's offspring.

Researchers at the Audubon Sugar Institute are involved in numerous projects to increase sugar mill efficiency. Cane sampling, yard losses, energy utilization, evaporator efficiency, optimization of crystallization and sugar reduction due to microbial loss were problems that were addressed.

Research conducted under the auspices of Goal 2 addressed safety problems associated with seafood, beef, and poultry products. Bacteriophages were investigated to control foodborne pathogens in seafood, especially oysters an important Louisiana product. These viruses which are naturally found in oysters may have potential as a processing aid to remove *vibio* contamination. Acidified sodium chlorite was found to be effective in inhibiting the growth of *Listeria* on the surface of "ready-to-eat" roast beef products. Likewise, edible film containing antimicrobial agents and zein coatings demonstrated promise in controlling *Campylobacter jejuni* on the surface of poultry. A crawfish chitosan edible coating with microbiocides was examined for its ability to extend shelf-life and assure desirable quality of fresh-cut produce.

Projects directed at achieving a healthy well-nourished population (Goal 3) concentrated on functional foods, pharmaceutical proteins in transgenic chickens, and ligands for cancer treatment. Research demonstrated that folic acid could be added to yogurts without adversely affecting product characteristics and could be added before pasteurization, enabling processors to follow HACCP requirements. Components in rice bran oil, especially gamma-tocotrienol (gT3), induced morphologically detectable cell death in cancer cells such as breast, liver, and immune cells. White leghorn chickens were engineered to produce pharmaceutical proteins in their egg white. Known methods of protein purification were then used to purify the pharmaceutical products. The technology developed produces transgenic chickens quickly and has the potential to greatly reduce the cost of obtaining the purified proteins. Other research directed at breast and prostatic cancer involved treatments composed of ligands which direct membrane-disrupting peptides to the cancer cells.

Goal 4 research is diverse. Significant accomplishments were achieved in projects addressing coastal erosion and restoration, solid waste management through improved composting technology, models for determination of the fate of arsenic in soils, effects of fertilizer management and conservation tillage on production and environmental stewardship, insects and environmental modification on forested wetlands, reduced pesticide insect management, non-point source runoff from agricultural operations, and soil testing for optimum fertilizer management.

Value added research conducted under Goal 5 also was diverse. Solid processing waste from crawfish and catfish were examined for products that could have added value such as the antimicrobial properties of chitosan from crawfish shells and health promoting fatty acids from catfish viscera. Finding a market for these waste products would minimize pollution problems and offset costs associated with disposal. Research continued to explore opportunities to expand domestic demand for alligator and emu leather. Nonwoven composites from bagasse, kenaf, and ramie were developed for automotive interiors and then evaluated for thermal, moisture, mechanical, and acoustical properties. Studies were conducted to develop value-added rice starch based ingredients. A target of the research is broken rice kernels which make up 15% of the milled rice in the United States. Investigations to develop new technology for the production of biopolymers from sucrose were begun. These polysugars have market potential as functional foods and/or additives in poultry rations.

### Extension Programs

Education programs of the Louisiana Cooperative Extension Service were conducted in all five goals. In FY 2003, professional Extension Full Time Equivalents (FTEs) totaled 376.83, and 5,571,272 educational contacts were made. The distribution of professional FTEs and educational contacts by federal goals was as follows:

| Federal Goal | Number of Extension FTEs | Educational contacts |
|--------------|--------------------------|----------------------|
| 1            | 106.55                   | 1,314,199            |
| 2            | 7.28                     | 156,159              |
| 3            | 66.09                    | 581,051              |
| 4            | 25.75                    | 413,628              |
| 5            | 171.17                   | 3,106,234            |
| Total        | 376.83                   | 5,571,272            |

Printed publications on a range of topics were issued for dissemination to adult and youth clientele in support of extension education programs. Seven new publications were developed, 42 publications were reprinted, and 19 publications were revised.

Over the last several years, the Ag Center's progressive technology initiative has led to an increased use of its home page to supplement the traditional print method of information dissemination. A number of publications have been placed on line for Extension clientele to

access, download, and/or print copies to meet their needs. Currently, there are 302 publications covering a variety of agricultural and home economics topics on line. A monitoring system to record client use of this information is being designed.

Examples of accomplishments in the several federal goals are indicated to provide a summary of the overall extension program of the Ag Center. These examples are also included under each goal.

### **Goal 1**

- A survey of aquaculture programs focused on producer education and adoption of best management practices showed that over 90% of catfish and crawfish producers relied on the LCES for BMP information, with 50% of them indicating they were following these practices. During 2003, over 400 producers were exposed to marketing concepts, and more than 100 producers were advised on key financial considerations affecting their profitability and competitive position. Other areas of aquaculture programming (non-commercial ponds and commodities such as ornamentals, pet turtles, and tilapia) have been impacted. Internet access by producers of a variety of web-based aquaculture information increased significantly.
- Aerial applicators have demonstrated increased knowledge and understanding of factors affecting drift of aerially-applied chemicals and have adopted drift control strategies to minimize waste and run-off from over-application, and ensure uniform pattern applications.
- Approximately 50% of nursery and landscape professionals in the state made changes in irrigation and fertilization management and the sale of new plant materials, and improved pest management strategies as a result of learning gained from the horticulture services and programs provided for their benefit.
- Specific accomplishments in commercial vegetable production include increased acreage and production of TSWV-resistant tomatoes, increased yield from the use of drip irrigation and plastic mulch, use of new vegetable varieties, and increased income through direct marketing
- Producer surveys in rice, cotton, soybean, sugarcane, forestry, and other agricultural commodities conducted on a four-year rotation consistently show the average adoption rate of BMPs in these commodities to be around 70%.
- Dairy producers in the Dairy Herd Improvement Program continue to produce about 4,300 pounds more milk annually through improvements in management, profitability, and longevity in the business. Forage quality for dairy cattle is improving due to (a) adoption of improved harvesting and storage methods of home grown forages, including round bale silage, and (b) feeding of higher quality forages such as alfalfa. Heat stress abatement, improved milk quality and herd health, and better environmental stewardship are additional gains realized by dairy producers through Extension programs.

- Equine education programs involving 175 people in Master Horseman training and 150 participants in race horse seminars show high levels of program satisfaction and improved knowledge and care of horses among participants. Horse verification farms reported improved profits from horse production.
- Farm asset and resource management programs involved 1,000 producers in farm management/record keeping workshops; 27 participants in FSA borrowers training; and nearly 100 people developing individual farm financial plans. Other significant programs included (a) the dissemination of over 150 enterprise budgets on major commodities to producers, agricultural lenders, local and state government agencies, and national risk management programs, and (b) estimating economic losses from costly hurricanes and flooding rains and securing legislative/federal assistance to affected farmers.
- Programs aimed at increasing farm profits included (a) the dissemination of agricultural marketing information to over 1,200 producers in Extension-organized workshops, and 3,000 producers and agribusiness firms through electronically produced and distributed marketing newsletters, (b) rice and soybean research verification work with the potential of increasing statewide annual income from these commodities by as much as \$113 million, and (c) decision assistance provided to nearly 600 producers in making acreage and yield selections under the 1998 Farm Bill with the potential to realize approximately \$13,000 each in additional government payments.
- A 2003 survey of fruit and pecan growers indicated that 87% of them obtained production information only or mostly from extension programs; and 80-91 % completely or mostly followed extension recommendations on managing insects, diseases, and weeds, tree/row spacing, liming, fertilization, pruning, and site preparation.
- Programs focused on managing risk in agriculture in a dynamic environment included (a) a well-attended marketing/agricultural crisis summit (300 participants) and follow up marketing alternatives and strategies meetings (300 producers), (b) educational meetings to help catfish producers understand the provisions of and obtain potential financial assistance of \$184,000 under the Trade Adjustment Program designed for producers of commodities adversely affected by increased imports, and (c) education and assistance to parish officials in development of mosquito abatement districts under the Louisiana Mosquito Abatement Plan as a result of which 40 parishes submitted preliminary plans for receiving awards of \$10,000 each in startup funds.
- Approximately 5,000 pesticide applicators participated in certification and recertification training during the year.
- In the weed science education program over 2,000 farmers, consultants, and industry personnel attended field days and other educational meetings and gained knowledge of weed identification, herbicide selection, and spray drift-reducing technology; more than 3,200



people visited the “2003 Suggested Weed Control Guidelines” web-site for weed control information.

- As a result of beef education programs, producers are providing better health, nutrition and reproductive programs for their cattle; better animal selection has taken place as indicated by the higher quality of cattle being produced; alternative marketing methods are being adopted; and quality assurance and low stress handling practices have been adopted by producers, thereby improving production efficiency.
- Research verification programs for soybean and rice continue to expand and demonstrate to cooperators and other producers the value of adopting a total production recommendation package. Increased yields and lower cost (\$1.02 per bushel) among farmers associated with the soybean verification program increased profit \$93.78 per acre. Likewise, producers in the rice verification program experienced increased profitability of \$1.26 per hundredweight or \$120.47 per acre.
- Seventy five percent of production acreage in Louisiana is under integrated pest management programming.

## **Goal 2**

- A total of 32 participants from seafood processing plants received training in HACCP (Hazardous Analysis of Critical Control Points) and SCP (Sanitation Control Procedures). As a result, seafood processors better understand the requirements of HACCP regulations and food safety in general. Fifteen Walmart distribution center employees from Louisiana and other states were also HACCP certified. Participants learned how to prepare HACCP plans and record keeping systems. Round table meetings with red meat and poultry processors, USDA FSIS regulatory officials, and academia helped participants better understand and better meet the requirements of HACCP regulations.

## **Goal 3**

- In the adult EFNEP program, 2,703 enrolled families with 9,106 members made positive dietary changes. Significant increases were made from program enrollment to graduation in the recommended daily consumption of servings of milk and milk products (8% to 27%), fruits (18% to 35%), vegetables (27% to 45%), breads and cereals (26% to 35%), and meat (46% to 57%). Homemakers were also managing their food dollars more wisely. At program exit, as compared to program entry, proportions of homemakers who more often shopped were significantly higher for comparison shopping (51%), planning meals in advance (58%), and shopping with a grocery list (60%). The youth EFNEP program reached 4,797 youth. As a result of the program, 45% of the enrollees ate a variety of foods, 49% increased their knowledge of basic nutrition, 39% increased their ability to select low-cost, nutritious food, and 42% improved food safety practices.. A total of 679 volunteers assisted in delivering the adult and youth programs.

- In 35 FNP parishes (counties), a total of 123,066 people, including 39,443 youth, were provided information on nutrition and food buying. Comprehensive evaluation of the program showed that over one-third of respondents surveyed reported learning how to read nutrition labels, the importance of adequate nutrition for development of children, and the use of the food guide pyramid in family meals planning; one-half of the respondents learned how to choose a diet rich in fruits and vegetables, with at least two servings of low-fat dairy products, moderate in sugar, and lower in salt.
- To combat the growing incidence of childhood obesity, a 10-week youth nutrition workshop was conducted with 4,000 youth learning basic nutrition and health concepts.

#### **Goal 4**

- Forest landowner education was a significant program thrust in renewable natural resources programming during the year in the different regions of the state with a number of successful and positive impacts. Examples of outcomes from the several regions include: 93 forest landowners indicated they expected to make financial gains of \$618,000 from their forest resources as a result of attending forest sustainability and management education programs in Northeast Louisiana; 234 participants in the Ark-La-Tex Forestry Forum in Northwest Louisiana valued the program at \$123,070, with 50% of them indicating in a follow-up survey that they had adopted practices recommended in the Forum and six respondents placing a dollar value of \$69,500 as a result of the practices adopted; over 2,000 forest landowners and 500 4-H youth in Southeast Louisiana parishes attending a variety of education programs learned valuable knowledge on forestry production and forest-related issues; the Woods Arson Prevention Association in Southwest Louisiana succeeded in reducing the number of arson fires and the number of acres burned, resulting in a savings of approximately \$10 million per year; 174 professional loggers and resource managers attended forestry best management practices workshops and gained knowledge regarding BMP implementation needed to obtain or maintain Master Logger status.
- In the USDA-funded Formosan subterranean termite program in New Orleans all original properties and 90% of new properties have been treated. Property owners are adopting recommended treatments and the number of termites has been reduced by 50% compared to non-treated areas. This will save money and less repair and insecticide will be needed.
- Nine sites in Louisiana carried the 7-week Southeastern US Region satellite broadcast of the Master Wildlifer Program covering basic and advanced information regarding proper management of wildlife on private lands, management for threatened and endangered species, and conservation considerations. There were 219 participants. Based on self-reported average saving of approximately \$19,947 per participant, the total saving for all participants was \$4,368,392. Respondents also stated they expected to earn an additional \$42,827 per person or a total of \$9,379,113. Approximately 90% of the respondents

expected to make changes in management practices based on what they learned in the workshop.

- Prescribed burn management certification training has been provided to 1,410 sugarcane producers since 2000. In addition, 2,000 producers and/or their representatives attended field day presentations in the summer of 2003 for more smoke management training. Complaints of burning by the general public have been declining and only five complaints were made during the 2003 harvest. Producers were also advised of studies showing that harvesting efficiency is improved without burning; as a result, 70% of the 2003 sugarcane crop was harvested green.
- In a new multi-state initiative between Louisiana and Mississippi to reach out to underserved forest landowners, i.e., African-American women and men and Caucasian women, four workshops were held on potential income opportunities from good, proper, sustainable forest management. A total of 346 landowners attended the workshops. In a post-participation survey, 53% (184 participants) assessed the value of the information they received at \$13,576 per landowner or \$2,498,000 for all landowners. Further, nearly one-half of the landowners indicated that they had used a forester in the past, while as many as 88% said they would use one in the future. Also, 85% expected to develop a written forest management plan for their land as a result of what they learned; a survey three months later revealed that 67% had adopted recommended management practices as a result of the program.
- Natural resource and environmental education camps for youth showed that respondents registered an average increase of 14% in knowledge gained, and had significant increases in science and math school scores, career changes contemplated, and environmental awareness.
- Poultry producers improved their waste management and dead bird disposal practices, awareness of EPA regulations, TMDLs, and BMPs. They are also preparing comprehensive nutrient management and bio-security plans for their farms
- Water resources development programs focused on assisting producers develop a better understanding of and adopt optimal water systems in their operations. As a result of these programs in targeted areas of the state, farmers in many parishes have a better understanding of the amount of water available from existing systems and how to best utilize water resulting in increased crop yield and more efficient irrigation. Furthermore, working with the Corps, NRCS, and DOTD, many landowners and community leaders have developed water resources to enhance crop yields, decreased their dependence on ground water, increased surface water for recreation, public water supply, business and industry, improved surface water quality and habitat during summer months, decreased the risk of crop losses from drought, ensured that more surface water is available for recreation, public water supply, business and industry and improved surface water quality and habitat in summer months while seeing that marsh in coastal areas receives proper nourishment.

- A Coastal Enhancement Team of 11 state, area, and parish level educators formed in 2001 has increased the visibility of the wetlands and coastal resources program using the internet and electronic dissemination techniques by making a number of extension education materials more visible and accessible to various stakeholders. The team also involved youth in the Marsh Maneuvers environmental program, and worked with local, state, and federal agencies, NGOs, and individual citizens on a variety of projects.
- More than 3,000 people received wood products education information through workshops, newsletters, mail, telephone and personal visits. It is estimated that the average value of information to workshop participants was \$10,000, with approximately two-thirds of them planning business expansions. In addition, approximately 3,000 people accessed the Extension Natural Resources web site for wood products information.
- The wildlife management program involved 422 4-H youth in timber and wildlife resources conservation and management training, the outdoor skills shooting sports program, and forestry contests. Also, 363 adults were contacted through meetings and other educational activities. A continuing education white tailed deer management program impacted 33 individuals who indicated the program content was worth an average of \$5,000. A total of 278 individuals who learned licensing requirements for pesticide application in rural and urban settings reported that the value of the certification training was \$50,000 in terms of their ability to continue their control programs.

#### **Goal 5**

- The Louisiana character education program initially based in Louisiana's school system but now expanding into communities is in its seventh year. During the 2002-2003 school year, a total of 315,185 individuals were involved in the program – 3,623 adult instructors, 3,274 youth instructors, 182,665 students in public, private, and home-based schools, and 49,106 persons outside the school system. Research-based educational materials, guest speakers, consultants and train-the trainer sessions are provided to schools, workplaces, sports programs, prisons and probation organizations, government agencies, and youth development organizations.
- Multi-faceted education programs in economic development have led to (a) Louisiana residents learning current social and economic conditions, increasing their understanding of economic development alternatives, developing and implementing strategic community development plans, and beginning the processes of local capacity building and sustainable development for developing their communities; (b) community leaders and volunteers in a number of parishes developing leadership and organization skills, and planning and implementing a variety of community projects in parishes such as a community playground and a 200-seat amphitheater, and a retirement center; (c) business promotion efforts such as entrepreneurship workshops, federal renewal communities tax and credits incentives training, value-added product development and e-business training, and new and alternative marketing strategies opportunities; (d) major tourism development programs – natural resource and

recreational tourism, agritourism, farmers markets, well-maintained visitor infrastructures, natural resource assets mapping, festivals and cultural events, and national and state parks and heritage area development; (e) workforce preparation education wherein 1,400 adults and youth learned about ethics and appropriate workplace behaviors, and gained skills in career exploration, customer relations, communication, team building, conflict resolution, professional development, and management.

- In family economics education, over 20,000 individuals and families were assisted in learning and applying financial management and budgeting skills. Sample surveys of family resource management programs showed that over 90% of participants planned to follow recommended management practices such as making and using a spending plan and tracking monthly spending, paying bills on time, setting financial goals and priorities, and building a fund for unexpected expenses. High School financial planning workshops reached 200 Free Enterprise teaches who will, in turn, reach approximately 20,000 students. In the Your Path to Home Ownership Program, 189 individuals learned how to better manage their finances, overcome personal obstacles to home ownership, avoid costly mistakes during the home buying process, and protect their investment.
- In the Louisiana Master Gardener Program in 2003, 249 new volunteer were trained and 782 senior master gardeners remained active. These volunteers gave 39,035 hours of service (equivalent to 18.7 Extension paraprofessional FTEs) valued at \$645,639, based on the U.S. Department of Labor's wage rate of \$16.54 per hour. Master gardeners greatly assisted local extension professional in garden shows reaching about 19,000 homeowners looking for gardening information.
- Approximately 6,000 parents, grandparents, and teen parents gained parenting knowledge and skills through various workshops such as Every Touch Counts, Bringing up Children, and Children in the Middle. Sample surveys of program participants showed that more than 80% of parents attending these workshops learned and planned to follow 3 different parenting practices that were taught in the workshops – helping their child's brain development, using a democratic parenting style, and effective communication with children.
- In FY 2003, the 4-H leadership and volunteer development program had 9,129 adult volunteers, and 5,024 youth volunteers; 2,100 youth were enrolled in 4-H leadership projects; 7,425 youth served as club officers or in parish leadership roles; 2,583 youth were enrolled in citizenship and civic education projects; over 31,250 youth were involved in at least one community service project and 12,328 participated in service learning projects.
- Outcomes of workforce preparedness programs for youth included 192 youth who learned social, etiquette, and dressing-for-the-work-environment skills; 179 youth understanding their responsibilities (punctuality, attendance, etc.) for ensuring job success; 672 youth writing their first resumes; 2,959 youth demonstrating career preparation skills and options.

## GOAL 1

LSU AgCenter Goal 1 is to achieve an agricultural production system that is highly competitive in a global economy.

### Research Reports

The variety development team at the Rice Research Station released a rice variety that provides more biomass (vegetation) throughout the crawfish season than current varieties grown primarily for rice production. The variety is intended for crawfish producers who raise crawfish only rather than double-crop with rice harvested for grain. The new variety has more cold tolerance and has shown the ability to regrow in the spring to produce good vegetation. Field trials demonstrated that more large, high-value crawfish were produced in fields with the new variety than those with grain-type rice varieties. The LAES, USDA-ARS, and the American Sugarcane League, working cooperatively, developed an improved sugarcane variety (HoCP 96-540) and released it for commercial planting in 2003. The new variety has demonstrated a consistent 10-15% increase in yield when compared to the most widely planted variety (LCP85-384). In addition, it appears to have more erect and less brittle stalks which should enhance harvest efficiency. Clearfield rice, a non-transgenic rice resistant to herbicides used to manage red rice, continued to be adopted by producers in several mid-south states in 2003. The agronomic performance and the weed management aspects of the varieties were good, and it is predicted that the acreage grown to these varieties will increase substantially in 2004. Other attempts to improve rice breeding has centered on the use of molecular markers to detect genes associated with desirable traits and utilization of double haploid technology to expedite the development of high yielding long grain varieties. Poor seedling vigor in semidwarf varieties, lodging in tall varieties, and outcrossing in herbicide resistant rice are three issues in rice production being addressed by treatment with plant growth regulators. Development of special purpose rice, such as medium and short grain varieties has become necessary to address a growing demand both domestically and internationally. Seed increases of two lines (medium-grain and Jasmine-type) were made in anticipation of possible variety releases.

A multi-state, multi-agency project continued in 2003 to monitor the movement of the Mexican rice borer from its present distribution along the Texas Gulf Coast. Insecticide evaluation, cultural practice management, and evaluation of Louisiana sugarcane and rice varieties in the pest's current location in Texas are building the foundation for a pest management plan for the insect when it eventually arrives in Louisiana. Although the current management of rice insect pests relies heavily on insecticide control, research on the diversification of management programs for water weevils, stink bugs, and stem borer via the integration of cultural practices and host plant resistance is currently underway. A phorid fly, *Pseudacteon tricuspis*, has been released at six sites in Louisiana and appears to be established at two locations. Data continues to be collected on the impact of this parasitoid on red imported fire ant workers. The salvinia weevil was released at three sites to control common salvinia, and a parasitic spechid from Bolivia was released for mole cricket control. Four projects are active to address concerns associated with the red imported fire ants – the invasive species' impact on diversity of ants in

Louisiana, the effect of red imported fire ants on ground-dwelling mammals and invertebrates, whether mound counts or food traps are the most effective monitoring tools, and the effect of landscape on fire ant presence. Research on weed control in sugarcane has resulted in registration and availability of new herbicide technologies and has demonstrated that reduced tillage offers potential to reduce grower inputs.

Numerous research studies have been conducted under simulated crawfish mono-cropping production and rotational cropping production scenarios to evaluate factors associated with harvesting (tap designs, density, frequency; bait types and quantity). Harvest costs have been reduced due to the new technology development and adoption of these harvesting recommendations have been estimated to save producers \$2 to \$3 million annually.

Development of multivalent vaccine to protect cattle against brucellosis, tuberculosis, and Johne's disease is under investigation. All three diseases deleteriously affect the economics of cattle production, directly affecting market value and interstate and international import/export potential of animals, which affect consumers also. As zoonotic organisms, these species pose a human health risk; therefore, an effective vaccine would benefit the general public by reducing a "bioterrorist" threat. Protozoan parasites of eastern oysters has prevented the establishment of this species along the Atlantic and Gulf of Mexico coasts. Several proteins with anti-protozoal and antibacterial properties have been identified and are being examined for their potential in developing resistance to Dermo disease in eastern oysters.

Microbial losses during sugar production range from loss due to undesirable polysaccharides to equipment loss associated with corrosion from microbially generated acids. Phage-display antibody technology was used to select a dextran binding phage that can be used for dextran detection in a dipstick assay. The low cost assay system may be suitable for mass monitoring. A new biocide discovered has proven to be effective for surface disinfection of all types of contaminated surfaces, including those with biofilms. In 2003, a computer program was developed to solve the material and energy balances and calculate the best transfer coefficients associated with evaporators at several sugar factories. Better data on evaporator performance should allow for more cost effective designs and energy savings. It is estimated that much of the \$6 million cost of natural gas at sugar factories in Louisiana could be reduced by appropriate evaporator design.

### **Extension Reports**

Selected accomplishments for Extension programs include:

- A survey of aquaculture programs focused on producer education and adoption of best management practices showed that over 90% of catfish and crawfish producers relied on the LCES for BMP information, with 50% of them indicating they were following these practices. During 2003, over 400 producers were exposed to marketing concepts, and more than 100 producers were advised on key financial considerations affecting their profitability and competitive position. Other areas of aquaculture programming (non-commercial ponds

and commodities such as ornamentals, pet turtles and tilapia) have been impacted. Internet access by producers of a variety of web-based aquaculture information increased significantly.

- Aerial applicators have demonstrated increased knowledge and understanding of factors affecting drift of aerially-applied chemicals and have adopted drift control strategies to minimize waste and run-off from over-application, and ensure uniform pattern applications.
- As a result of beef education programs, producers are providing better health, nutrition and reproductive programs for their cattle; better animal selection has taken place as indicated by the higher quality of cattle being produced; alternative marketing methods are being adopted; and quality assurance and low stress handling practices have been adopted by producers, thereby improving production efficiency.
- Approximately 50% of nursery and landscape professionals in the state make changes in irrigation and fertilization management and the sale of new plant materials, and improve pest management strategies as a result of learning gained from the horticulture services and programs provided for their benefit.
- Specific accomplishments in commercial vegetable production include increased acreage and production of TSWV-resistant tomatoes, increased yield from the use of drip irrigation and plastic mulch, use of new vegetable varieties, and increased income through direct marketing
- Producer surveys in rice, cotton, soybean, sugarcane, forestry, and other agricultural commodities conducted on a four-year rotation consistently show the average adoption rate of BMPs in these commodities to be around 70%.
- Dairy producers in the Dairy Herd Improvement Program continue to produce about 4,300 pounds more milk annually through improvements in management, profitability, and longevity in the business. Forage quality for dairy cattle is improving due to (a) adoption of improved harvesting and storage methods of home grown forages, including round bale silage, and (b) feeding of higher quality forages such as alfalfa. Heat stress abatement, improved milk quality and herd health, and better environmental stewardship are additional gains realized by dairy producers through Extension programs.
- Equine education programs involving 175 people in Master Horseman training and 150 participants in racehorse seminars show high levels of program satisfaction and improved knowledge and care of horses. Horse verification farms reported improved profits from horse production.
- Farm asset and resource management programs involved 1,000 producers in farm management/record keeping workshops; 27 participants in FSA borrowers training; and nearly 100 people developing individual farm financial plans. Other significant programs included (a) the dissemination of over 150 enterprise budgets on major commodities to



producers, agricultural lenders, local and state government agencies, and national risk management programs, and (b) estimating economic losses from costly hurricanes and flooding rains and securing legislative/federal assistance to affected farmers.

- Programs aimed at increasing farm profits included (a) the dissemination of agricultural marketing information to over 1,200 producers in Extension-organized workshops, and 3,000 producers and agribusiness firms through electronically produced and distributed marketing newsletters, (b) rice and soybean research verification work with the potential of increasing statewide annual income from these commodities by as much as \$113 million, and (c) decision assistance provided to nearly 600 producers in making acreage and yield selections under the 1998 Farm Bill with the potential to realize approximately \$13,000 each in additional government payments.
- A 2003 survey of fruit and pecan growers indicated that 87% of them obtained production information only or mostly from extension programs; and 80-91 % completely or mostly followed extension recommendations on managing insects, diseases, and weeds, tree/row spacing, liming, fertilization, pruning, and site preparation.
- Programs focused on managing risk in agriculture in a dynamic environment included (a) a well-attended marketing/agricultural crisis summit (300 participants) and follow up marketing alternatives and strategies meetings (300 producers), (b) educational meetings to help catfish producers understand the provisions of and obtain potential financial assistance of \$184,000 under the Trade Adjustment Program designed for producers of commodities adversely affected by increased imports, and (c) education and assistance to parish officials in development of mosquito abatement districts under the Louisiana Mosquito Abatement Plan as a result of which 40 parishes submitted preliminary plans for receiving awards of \$10,000 each in startup funds.
- Approximately 5,000 pesticide applicators participated in certification and /recertification training during the year.
- In the weed science education program over 2,000 farmers, consultants, and industry personnel attended field days and other educational meetings and gained knowledge of weed identification, herbicide selection, and spray drift-reducing technology; more than 3,200 people visited the “2003 Suggested Weed Control Guidelines” web-site for weed control information.
- Research verification programs for soybean and rice continue to grow and demonstrate to cooperators and other producers the value of adopting a total production recommendation package. Increased yields and lower cost among farmers associated with the soybean verification program increased profit by \$1.02 per bushel or \$93.78 per acre. Likewise, producers in the rice verification program experienced increased profitability of \$1.26 per hundredweight or \$120.47 per acre.

- Seventy five percent of production acreage in Louisiana is under integrated pest management programming.

Total extension expenditure on Goal 1 programs was \$8,538,491. Of this amount, multi-state expenditure is estimated at \$2,398,072 and multi-function expenditure at \$6,616,058.

Total Extension FTEs in Goal 1 programs were 106.55 and 1,314,199 educational contacts were made.

**GOAL 1**  
**EXTENSION SUMMARIES**

## **Federal Goal 1**

### **AQUACULTURE**

#### **Key Theme: Aquaculture**

**Greg Lutz, Associate Professor, Aquaculture Research Station, LSU AgCenter**

#### **Program Description**

The aquaculture program focuses on the delivery of research-based information, as well as updates on state and national policy issues and international trade concerns. This information is provided through newsletters, leadership group activities, producer meetings, and phone consultations.

This is an ongoing program facilitating information exchange and dissemination through established channels. Collaboration has been obtained from agencies such as the NRCS, FSA, and Louisiana Department of Wildlife and Fisheries as well as from producer organizations such as the Louisiana State Seafood Industry Advisory Board, Louisiana Alligator Farmers and Ranchers Association, The Louisiana Catfish Farmers Association, The Louisiana Crawfish Farmers Association, The Louisiana Crawfish Research and Promotion Board, and the Louisiana Catfish Promotion and Research Board. Each of these entities provides input, both solicited and unsolicited, concerning programming needs. All input is considered in the formulation of programming, based on the need to balance perceived needs with available resources while maintaining a focus on providing research-based information to solve problems.

Historically, “crawfish” and “recreational ponds” have been the two most often-searched topics by visitors to the AgCenter web pages. Aquaculture programming in Louisiana encompasses a variety of audiences, including commercial producers (no less than 6 major commodities), pond owners, policy and regulatory professionals, and the general public. Each audience has its own needs and concerns, and there is often little opportunity to develop overlapping programming. Nonetheless, an estimated 20,000 citizens and youth typically gain knowledge concerning aquaculture through 4-H Mini-Farm, Ag Expo, Catfish Festival, Crawfish Festival, and Earth Day activities each year.

#### **Program Impact**

Both ground and surface waters are used for aquaculture production in Louisiana. Over the years both the quantity and quality of these resources have been taken for granted. However, several years of drought have reduced both ground and surface water supplies and made them more susceptible to pollution. Total Maximum Daily Load (TMDL) provisions of the Clean Water Act have made producers, operators, and the general public aware that many of the state's waters are not meeting required standards for their designated uses. Extension aquaculture programming has focused on the development and dissemination of Best Management Practices, with a

particular emphasis on water conservation. Additional emphasis was placed on informing producers and other stakeholders concerning ecological impacts of aquaculture. Over 560 commercial aquaculture producers and other stakeholders were kept abreast of proposed EPA effluent guidelines and other policy issues. Additionally, industry leaders and stakeholders were advised directly concerning evolving EPA effluent limitation guidelines in commodity board meetings.

Although numbers of catfish producers have declined in line with recent industry-wide trends, numbers of crawfish producers have increased over the past two years. In the most recent survey of Louisiana catfish and crawfish producers (late 2001), the vast majority (93% and 87%, respectively) in each group reported receiving information from the LCES during the past years in newsletters, over the phone, or in person. Seventy-three percent of crawfish producers indicated their management practices have been greatly influenced by Extension recommendations. Fifty-three percent of catfish producers indicated their management practices were 'greatly' in agreement with Extension recommendations, while 47% indicated their management practices were 'somewhat' in agreement.

These levels of contact, and relevancy, are estimated to have remained unchanged since the survey was conducted, or to have increased slightly due to 1) higher levels of adoption among surviving catfish operations and 2) an increased demand for technical information among new producers entering the crawfish industry. During 2003, over 400 aquaculture producers were exposed to marketing concepts relating to their specific commodities and more than 100 were advised on key financial considerations affecting their profitability and competitive positions. Over 30 catfish producers were present for an on-farm demonstration in Concordia Parish of an innovative catfish grader developed at the University of Arkansas at Pine Bluff. Approximately 245 crawfish producers attended informational meetings in conjunction with the re-organization of the Louisiana Crawfish Farmers Association, facilitated by AgCenter personnel. Additionally, industry leaders and stakeholders requested advice and assistance year-round concerning classroom aquaculture issues, exotic and invasive aquatic species, and leadership development.

Levels of impact in these and other areas of aquaculture programming (non-commercial ponds and commodities such as ornamentals, pet turtles, and tilapia) have increased significantly over the past 12-18 months, primarily due to internet access. In 2003, extensive efforts were made to develop web-based information delivery on aquaculture. Clientele from Louisiana and other states have benefited from these initiatives. In-depth web pages on the LSU AgCenter website, with technical, regulatory, marketing and policy information, were developed for catfish, crawfish, alligator, pet turtles, tilapia, freshwater prawns and baitfish. Additionally, pages on oysters, crawfish, alligator, pet turtles and tilapia were developed for Iowa State University's web-based Agricultural Marketing Resource Center (AgMRC). AgMRC is a national, USDA-funded center dedicated to assisting producers involved in value-added agriculture. Development of additional web-based aquaculture information delivery continues.

County agents in urban/suburban parishes are swamped with recreational pond calls and demands. In response to these demands, arrangements were made with the Louisiana Department of Wildlife and Fisheries (LDWF) to reprint the very popular Extension publication on recreational fish pond management for use by both organizations. The LDWF provided 75% of the printing costs while publications were divided evenly for distribution to the public.

### **Source of Funds**

Federal, state and local funds have been used for this programming effort. Additionally, collaboration with agencies such as LDWF and commodity boards have resulted in funding for educational activities and materials.

### **Scope of Impact**

Multi-state: While the majority of impact occurs in Louisiana, LCES programming and educational materials are used by clientele from surrounding states (an estimated 30% of total contacts), more distant states, and foreign countries. Educational materials posted on the web and developed through the Southern Region Aquaculture Center represent multi-state efforts to disseminate research-based information. A timely example of multi-state programming involves the development of educational materials for catfish producers participating in the Trade Adjustment Assistance Program. AgCenter professionals served on a team that included specialists from a number of catfish producing states to provide uniform training and certification for catfish producers throughout the industry.

Crawfish, recreational pond, pet turtle, alligator and tilapia production programming, in particular, are utilized by producers and consumers in a number of states. Total estimated FTEs expended in the aquaculture program in the report year were approximately 7.5. It is estimated that 65% of program effort is multi-state (EPA effluent issues, Southern Regional Aquaculture Center, professional meetings, phone/internet consultations with out-of-state counterparts, LCES specialist-agents contact and programming), the dollar equivalent of which is \$390,663 (7.5 FTEs x \$80,136 per FTE x .65).

Multi-function: Much of the AgCenter's aquaculture programming has involved an integrated approach between research and extension- especially with regard to developing best management practices to minimize water quality impacts. It is estimated that 40% of aquaculture program FTEs can be attributable to integrated research-extension activities, the dollar equivalent of which is \$240,408 (7.5 FTEs x \$80,136 per FTE x .40).

## **Federal Goal 1**

### **AERIAL APPLICATION**

#### **Key Theme: Agricultural Profitability**

**Dan Martin, Extension Associate, Department of Biological and Agricultural Engineering, LSU AgCenter**

#### **Program Description**

The specialist responsible for this program was actively involved in the Louisiana Agricultural Aviation Association (LAAA) and the National Agricultural Aviation Association (NAAA) to stay abreast of the current needs and issues of the industry and was also in close communication with the Louisiana Department of Agriculture and Forestry (LDAF) which regulates the aerial application industry in Louisiana.

Surveys of aerial applicators were conducted to determine their needs and issues and LDAF statistics on drift complaints, violations, and accidents were reviewed.

One of the greatest needs identified in 2002 and 2003 was the need to bring the state rules and regulations governing aerial application into congruence with current aerial application research. Off-target drift continues to be the biggest issue in aerial application. In 2002, 49 complaints directly attributed to aerial application were registered with the Louisiana Department of Agriculture and Forestry. Spray and spreader patterns, although in check overall, require continuous testing and improvement as new planes and equipment are purchased.

Meetings with individual aerial applicators, aerial application researchers, and LDAF personnel are required to determine what rules and regulations need to be updated and revised. A meeting of influential stakeholders was called and we discussed, as a group, what changes needed to be made in the rules and regulations. An increase in the maximum boom pressure from 40 psi to 60 psi was approved and reduction in the rate at which 2,4-D must be applied is still under consideration pending scientific research to show that such a change would not increase the drift potential of the product.

A drift minimization education workshop was held at the annual meeting of the LAAA and discussions were held with officials from the LDAF on potential causes of the 2,4-D drift problem on to cotton.

Drift complaints in 2003 that could be directly attributed to aerial application were down from 49 in 2002 to 39 in 2003, a 20% decline.

Fifteen pattern testing clinics were held throughout the state. Thirty-six spray and spreader systems were tested, modified, and improved. The aerial applicators who voluntarily

participated in these pattern testing clinics appreciated the ability to see what kind of work their plane was doing on paper, make improvements in their patterns, and remain competitive in their businesses. Improvements to their systems were done on-site and these changes typically stay in effect until new or different equipment is purchased.

Program collaboration was as follows:

- (1) Louisiana Agricultural Aviation Association – Represents Louisiana aerial applicators and their interests. Provides \$500/year in financial support to the LSU AgCenter Aerial Application Program.
- (2) Louisiana Department of Agriculture and Forestry – Regulates the aerial application industry and communicates regulatory information and statistics.
- (3) USDA-ARS – Provides aerial application research reports

### **Program Impact**

The Aerial Application Program has helped aerial applicators do a better job of uniformly applying pesticides, fertilizers, and seeds. This minimizes the over-application of materials, which results in less wasted product and reduces the run-off potential of chemical inputs. A uniform pattern also minimizes the under-application of chemical inputs which results in better pest control and reduces streaking in the fields. Aerial applicators have demonstrated increased knowledge and understanding of the factors affecting drift and have adopted drift control strategies to reduce drift.

### **Source of Funds**

Smith-Lever 3 b, c (Federal Funds)

### **Scope of Impact**

Multi-state: The Aerial Application Program in Louisiana is part of a nationally coordinated education program called Operation S.A.F.E. (Self-regulating Aerial Flight Efficiency). This program is coordinated through the National Agricultural Aviation Association and has analysts from Texas, Nevada, Oklahoma, Arkansas, Georgia, Minnesota, Colorado, Kansas, Mississippi, Nebraska, and North Carolina. Approximately 75% of the Louisiana Aerial Application Program materials, research, software, and equipment are derived from this national effort. A total of 1.1 FTEs were devoted to the Aerial Application Program. Hence the dollar value of the multi-state effort = [(75% of the program) x 1.1 (FTE) x \$80,136 (\$ equivalent of 1 Extension professional FTE)] = \$66,112.

Multi-function: The Louisiana Aerial Application Program relies on research-based information. Most of the aerial application research comes from the USDA-ARS Pest Management Unit in College Station, Texas. Texas' research contribution to the program along with others constitutes approximately 50% of the program. The dollar value of the multi-function effort =



[(50% of the program) x 1.1 (FTEs) x \$80,136 (\$ equivalent of 1 Extension professional FTE)] = \$40,068.

## **Federal Goal 1**

**Title: Beef**

**Key Theme: Animal Production Efficiency**

**William Davis, Professor (Beef Cattle), Department of Animal Sciences, LSU AgCenter**

### **Program Description**

Stakeholders meetings are used to introduce and discuss efficient production practices for beef cattle. Their oversight and input are necessary to develop effective educational programs. Major topics of discussion included reproduction, health, nutrition, low stress handling, quality assurance, marketing, and breeding and animal selection. Major educational efforts are utilized to meet the educational needs. These are; Master Cattle Producers Program, Beef Forage Short Course, Calf to Carcass Program, and the Bull Test Program. The master cattle producer educational program has been developed covering pasture management, nutrition, animal health/biosecurity, reproduction, animal handling/BQA, breeding and selection, end product and financial management and marketing plus 8 hours of master farmer programs. The program is a joint effort of Louisiana Cattlemen's Association, NRCS, Farm Bureau and the LSU Agricultural Center. The Forage-Based Bull Performance Test was initiated and maintained to provide seedstock and commercial producers with growth performance data of bulls while on forage as a means of identifying superior bulls for efficient beef production on grass. Planning sessions for the Beef-Forage Short Course were held to discuss the program in order to continue to provide producers with critical information on efficient production practices as well as the general direction of the industry from a national perspective. The Louisiana Calf to Carcass Program was developed and expanded to provide producers with preconditioning and feedlot performance, and carcass information on their own cattle. Meetings were held to discuss the aforementioned data with the stakeholders. Discussion on the general direction of the industry as it becomes more consumer driven was initiated and producers were encouraged to think of themselves more as beef (meat) producers and not cattle (animal) producers. In support of the outreach efforts, numerous parish cattlemen's meetings, research and extension field days, home and office visits, mass media contacts (television, radio, news and trade magazine articles, etc), and other meetings have been held in order to educate producers.

The following collaborators were involved in educational programming on many levels, including planning, implementation, financial support, presentation, labor support, and data collection:

Fort Dodge Animal Health  
Merial Animal Health

Elanco Animal Health  
Louisiana Cattlemen's Association  
Louisiana Beef Industry Council  
Nutrena Feed Division  
Lansco Nutritional Services, Inc.  
Pfizer Animal Health  
LSU School of Veterinary Medicine  
Hitch Feedlot, Inc.  
McNeese State University  
LSU-Alexandria Campus  
Louisiana Department of Agriculture and Forestry  
Prison Enterprises  
University of Louisiana at Monroe  
Dixon Correctional Institution

### **Program Impact**

As a result of the educational programs, the producers are providing better health, nutrition and reproductive programs for their cattle. Better animal selection has taken place as indicated by the higher quality of cattle being produced. Alternative marketing methods are being adopted. Quality assurance and low stress handling practices have been adopted by producers, thereby improving production efficiency. More long range planning with sustainability seems evident. Agent training through multi-state and multi-functional efforts has improved technical transfer to producers.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

The impact of the program has specific components which are both confined to Louisiana and serve a multi-state role. Examples of activities typically confined to Louisiana include local parish and district area meetings, advisory committee meetings, the Forage-Based Bull Test Program, as well as Research Station Field Days. These activities are specifically aimed toward Louisiana producers without a significant multi-state component. Examples of activities that have multi-state implications with collaborative agreements include the Louisiana Calf to Carcass Program and the Louisiana Beef Forage Short Course. These programs involve other states such as Texas, Oklahoma, Kansas, Mississippi, Alabama, and Arkansas. Examples of multi-functional activities (involves both research and extension) include the Calf to Carcass Program, Research Station Field Days, the Beef Forage Short Course, agent training, and advisory committees.

Multi-state: Collaborative multi-state work constitutes approximately 40% of the effort. At 13.47 FTEs for adult and youth work in beef, the dollar equivalent of multi-state work is \$431,772.

Multi-function: Integrated research-extension work constitutes approximately 80% of the effort. At 13.45 FTEs for adult and youth work in beef, the dollar equivalent of multi-function work is \$863,546.

## **Federal Goal 1**

### **COMMERCIAL NURSERY AND LANDSCAPE SYSTEMS**

#### **Key Theme: Ornamental/Green Agriculture**

**Allen Owings, Professor, Department of Horticulture, LSU AgCenter**

#### **Program Description**

Louisiana's commercial nursery and landscape systems program provides service to clientele engaged in commercial green industry activities, namely wholesale ornamental producers of woody and herbaceous plant material, retail garden centers' personnel, landscape architects, and landscape contractors. Commercial turfgrass is also included in this effort. Arborists are also now included in continuing education classes conducted by the LSU AgCenter. Stakeholder input is obtained quarterly throughout the year at meetings attended by representatives of Louisiana's green industry. Clientele surveys are also conducted to obtain program input. Major problems being addressed at the current time include promotion and marketing of plant material (Get It Growing program, Louisiana Plant Materials Conference, Plant Locator Lists), best management practices for irrigation and fertilization management (primarily for nursery crop producers), pest identification and control, and improving efficiency and profitability by adopting other recommended production practices. Nursery and landscape professionals are more aware of educational programs now offered by the Louisiana Cooperative Extension Service. As a result of these program efforts the following has been accomplished: (1) increased use of county agents and regional horticulturists for problem diagnosis and problem prevention, (2) introduction of new plant material, (3) retailers are providing training opportunities for their employees, (4) increased industry awareness of TMDLs, best management practices, and similar environmental issues, and (5) water quality is being recognized by nursery and landscape professionals as a key part of their production and maintenance programs. Primary program delivery has been accomplished by education programs (in-state and collaboratively with Arkansas, Mississippi, Alabama, and Texas), on-site visits, e-mail updates, web page development, mass media, and newsletters. Cooperative and collaborative efforts are maintained and are ongoing with the following: Louisiana Nursery and Landscape Association (newsletters and education programs), Louisiana Turfgrass Association (newsletters and education programs), Texas Nursery and Landscape Association (five-state educational program effort), and the state

cooperative extension services in Arkansas, Alabama, and Mississippi (Gulf States Horticultural Expo and Mid-South Greenhouse Growers Conference).

### **Program Impact**

Every licensed nursery and landscape professional receives information from the Louisiana Cooperative Extension Service's commercial nursery and landscape systems program annually. Approximately 50% participate in the education programs on a regular or occasional basis. Many make production changes based on information learned. These changes are primarily in the areas of irrigation and fertilization management and selling new plant material. Landscapers are adopting improved pest management strategies and learning to improve horticultural services provided to their clientele using LSU AgCenter recommendations.

### **Source of Funds**

Smith-Lever 3 b, c

### **Scope of Impact**

The commercial nursery and landscape systems program impact is multi-state (AL, MS, TX, AR) and multi-function. The Louisiana Cooperative Extension Service allocated 4.42 FTEs for the commercial nursery and landscape systems program for FY2003.

Multi-state: Approximately 30% ( $0.30 \times 4.42 \times \$80,136 = \$106,260$ ) of the program in commercial nursery and landscape systems is attributable to multi-state efforts (primarily Gulf States Horticultural Expo, Mid-South Greenhouse Growers Conference, and Nursery/Landscape Expo educational short course).

Multi-function: Approximately 25% of the commercial nursery and landscape systems program is multi-function valued at \$88,550 ( $0.25 \times 4.42 \times \$80,136$ ).

## **Federal Goal 1**

### **COMMERCIAL VEGETABLES**

#### **Key Theme: Profitability in Vegetable Production**

**James Boudreaux, Professor, Department of Horticulture, LSU AgCenter**

#### **Program Description**

The Louisiana commercial vegetable industry involves 3,900 growers in 53 parishes who produce 33 different crops on 10,000 acres for a gross farm value of \$38.9 million.

The Louisiana commercial vegetable program provides information and assistance to growers involved in commercial vegetable production. Program direction is obtained from commercial vegetable growers, grower organizations, and inputs from county agents. Major problems addressed at the current time are evaluation of Tomato Spotted Wilt Virus resistant tomato varieties, cultural practices to lessen the occurrence of TSWV, evaluation of new vegetable varieties, adoption of efficient production practices, adoption of profitable marketing practices, and employment of best management practices in the production of vegetable crops.

Primary program delivery has been accomplished by farm visits, growers meetings, demonstration plots, e-mail updates, and phone calls. Cooperative efforts involved the Louisiana Vegetable Growers Association and the state cooperative extension services in Mississippi and Alabama (Deep South Fruit and Vegetable Growers Conference.)

#### **Program Impact**

The main impact of the program is increased vegetable yields and profits by growers who are utilizing the information generated from this work. These increases are due to use of new varieties, employment of improved production techniques, and increased use of direct marketing opportunities.

Specific accomplishments include: (1) increased production of tomatoes by growers in areas of high TSWV occurrence, (2) increased yields from the use of drip irrigation and plastic mulch, (3) use of new vegetable varieties and (4) increased income from the use of direct marketing opportunities.

#### **Source of Funds**

Smith Lever 3 b, c  
State

## Scope of Impact

A total of 7.25 FTEs of professional effort was expended on this program.

Multi-state: The only multi-state effort in the commercial vegetables program is the Deep South Fruit and Vegetable Growers Conference with Alabama and Mississippi. Extension specialists, researchers, and growers collaborated on the development and presentation of the program. It is estimated that 10% of the total commercial vegetable program was multi-state work, the value of which is \$58,099 (7.25 FTEs x \$80,136 per FTE x .10).

Multi-function: Extension specialists, agents, and researchers collaborated in the development of the program and getting information to growers for a 100% multi-functional effort equal to \$580,987 (7.25 FTEs x \$80,136 per FTE x 1.0).

## Federal Goal 1

### COTTON

#### Key Theme: Agricultural Profitability

**Sandy Stewart, Professor, Central Region Office, LSU AgCenter**

#### Program Description

Advisory groups were used to determine industry problems and direction for cotton extension programs. Results from previously conducted surveys were also used for program guidance.

Problems identified included need for cotton variety, pest management, conservation tillage systems, weed control and herbicide information; ways to improve cotton fiber quality; soil management; defoliation and plant growth regulation; irrigation timing and management.

A comprehensive extension education program for cotton producers was implemented. The performance goal of the program was to increase yields and profits of Louisiana cotton producers by following recommended best management practices to produce their crop. The program provided information in the areas of variety selection, pest management, tillage, fertility, plant growth regulator usage, herbicide selection and weed control, defoliation, and irrigation. The following educational activities were conducted during the year.

- Five agent training sessions were conducted to inform LSU Agricultural Center personnel working in cotton production of the latest recommended best management practices.
- The state cotton specialist and parish extension agents conducted 50 on-farm demonstrations in the major cotton growing parishes.
- Four on-farm research projects were conducted jointly with faculty of the LSU Agricultural Center's Experiment Station.

- Thirty-nine educational meetings and three field days were conducted to keep growers informed of recommended practices.
- A monthly cotton newsletter was distributed to producers, consultants, and agribusiness personnel throughout the growing season. The newsletter contained updates on recommendations and kept clientele informed of current events.
- Mass media programs were produced weekly to keep clientele informed.
- Specialists and agents were quoted in or wrote news articles pertaining to cotton production throughout the growing season.
- The LSU AgCenter cotton web page was updated weekly and e-mail updates were sent weekly to growers and agribusiness personnel.
- The state cotton specialists worked across state lines and attended professional work group sessions to insure that Louisiana growers are receiving the best possible information.
- Faculty from other land grant universities in cotton producing states and industry personnel were used to conduct statewide education programs.

Collaborators in the cotton education program included extension and research faculty within the cooperating land grant system (Louisiana State University and A&M College and Southern University and A&M College); other educational institutions within the state; extension research faculty within the region's land grant institutions (University of Arkansas, University of Tennessee, Auburn, Mississippi State, Texas A&M, Virginia Tech, North Carolina State, University of Georgia, Clemson University, and Oklahoma State); USDA agencies; state environmental agencies; Louisiana Farm Bureau Federation; Louisiana Cotton Producers Association; Louisiana Association of Agricultural Consultants; Louisiana Department of Agriculture and Forestry; Private industry.

### **Program Impact**

- Over 2,000 farmers, consultants, and industry personnel attended the field days and educational meetings.
- Training sessions for LSU AgCenter personnel were attended by extension agents and other LSU AgCenter faculty working in cotton production programs.
- Extension agents and specialists made presentations at national meetings.
- Nineteen extension agents and/or specialists attended national meetings.
- Extension agents and/or specialists conducted 50 on-farm demonstrations.
- Five joint research-extension farm projects were conducted.
- Three out-of-state speakers were used for education programs.
- Almost 80% of Louisiana cotton producers follow LSU AgCenter recommendations.

### **Source of Funds**

Federal Smith-Lever 3 b, c  
 Cotton Incorporated  
 Private Industry grants

## **Scope of Impact**

Multi-state: Participation in and information-sharing from Beltwide Cotton Conferences, with a total multi-state effort valued at \$185,314 (9.45 FTEs x \$80,136 per FTE x 0.25).

Multi-function: Researchers and extension specialists collaborated on preparing publications, development and training of agents, consultants, agribusiness personnel, and farmers for a multi-function effort valued at \$757,285 (9.45 FTEs x \$80,136 per FTE x 1.0).

## **Federal Goal 1**

**Title: Dairy**

**Key Theme: Agricultural Competitiveness**

**Charles Hutchison, Associate Professor, Department of Dairy Science, LSU AgCenter**

## **Program Description**

In meetings with stakeholders (dairy producers, milk marketing cooperatives field men, veterinarians, feed company personnel, lenders, Department of Agriculture and Forestry personnel, NRCS and FSA personnel, health department sanitarians, and agribusiness personnel) problems with interpreting and utilizing dairy herd records, somatic cell count (SCC), forage quality, nutrition, dry cow and replacement management, cow comfort, financial and risk management, herd health, and waste management were identified. Dairy herd record training for field men and producers was continued. Field days, seminars, conferences, meetings, farm visits, demonstrations, and verification trials were conducted. Materials on forage quality, dairy cattle nutrition, dry cow management, replacement heifer management, cow comfort, financial risk management, and herd health were disseminated. A Master Farmer program has been developed and will be implemented to educate producers on environmental and waste management concerns. Due to the collaboration of extension specialists and agents, health department sanitarians, milk marketing cooperatives field men, Louisiana Department of Agriculture and Forestry Livestock Sanitary Board, Louisiana Farm Bureau dairy committee and research personnel from the Hill Farm Research Station, a mycoplasma mastitis and other mastitis pathogens monitoring program has been developed and will be implemented on all Louisiana dairy farms in 2004.

## **Program Impact**

As a result of these programs, herds on DHI produce approximately 4,300 pounds more milk annually due to producers making improvements in their management and profitability while staying in business longer. Forage quality is improving due to the adoption of improved harvesting and storage methods of home grown forages such as round bale silage of primarily ryegrass along with some other perennial grasses. More producers are purchasing higher quality forages such as alfalfa to improve the overall nutrient value of the forages consumed by the



milking herd. More producers are adopting heat stress abatement strategies in the summer in order to improve cow comfort. Producers are making greater progress in lowering SCC and improving herd health by implementing new procedures and technologies associated with milk quality and herd health. Producers are making progress in the area of environmental stewardship of the land by taking advantage of programs implemented to improve the waste management systems of their operations.

**Source of funds:** Smith Lever 3 b, c

### **Scope of Impact**

Ideas and materials for the program are the result of SERA – IEG 15 (Dairy), a memorandum of understanding between Louisiana and Mississippi on joint dairy educational programs, collaboration between LA DHIA and MS DHIA for joint training, Southern Dairy Conference, Mid-South Ruminant Nutrition Conference, Dairy Records Management Systems and professional contacts with other state’s dairy professionals.

Multi-state: 75% of the program is a result of multi-state meetings and materials. 4.25 FTEs were devoted to the adult dairy effort. Therefore, the dollar value of the multi-state effort was \$255,434.

Multi-function: Researchers, extension specialists and agents collaborated on the development, education and training of agents and producers for an 85% multi-functional effort. The dollar value of the multi-functional effort was \$289,491.

### **Federal Goal 1**

## **EQUINE EDUCATION PROGRAM**

**KEY THEME: Animal production efficiency**

**Clint Depew, Professor, Department of Animal Sciences, LSU AgCenter**

### **Program Description**

A survey of the equine industry, meetings with producers and 4 meetings with the Equine Education Committee (agents, researchers and industry leaders) were used to identify problems in the equine industry. Many problems in the feeding, breeding, marketing, and training of horses were identified. Additionally, it was found that horsemen tend to look to other horsemen and breed publications as their primary source of information.

A “Master Horseman” program was developed to provide training to a select group of leaders in the industry. These trained volunteers will in turn have the responsibility to teach others in the industry the scientific concepts they have learned. This program will improve the skill of the

industry leaders which will influence the rest of the industry. Additionally, a verification program was started to make model farms out of a few operations which would then be used to influence others. A tour of outstanding equine operations was conducted to help industry leaders evaluate their operations and develop a vision of the equine industry in Louisiana. Meetings were established on race tracks to impact the development and training of race horses in the state. A multi-state web page was developed (HorseQuest.info) to answer questions for horse producers. Industry leaders, researchers, and agents were involved in the planning, implementation, and evaluation of the program.

### **Program Impact**

Nine Master Horseman programs have been conducted, training 175 people with 7 more planned for the next year. Evaluations have indicated a very high level of satisfaction with the program. The trained volunteers have conducted 3 camps for youth, many clinics, a breeder's school, and sponsored education programs at the race tracks. Several groups are planning their own Master Horseman programs for their adults and youth. The verification farms have reported improved profits from horse production and the race horse seminars have drawn 150 participants who reported improved knowledge in the development and care of their horses. The horse tour resulted in a greater vision for the Louisiana horse industry, contacts for future workshops, and greatly expanded knowledge of the horse industry.

### **Source of Funds**

Federal (Smith Lever 3 b, c)

### **Scope of Impact**

Multi-state: A southern region multi state web page was developed which serves producers and horsemen in 13 states. Additionally, the Arkansas Cooperative Extension Service is collaborating on the equine educational program. Joint planning, agent training, master horseman programs, and seminars have been conducted. The Southern Region Championship Horse Show and Contest will be jointly sponsored this year. An estimated 10% of the equine program is attributed to multi-state activities, which is equivalent to \$148,572 (10% x 3.86 x \$80,136 per FTE ).

Multi-function: Researchers are involved in the equine education committee which formulates the programs and activities of the equine program. They, along with extension personnel, are also involved in program delivery and evaluation. The dollar value of this multi-function effort equals \$154,663 [50% (estimated % of program) x 3.86 (FTEs devoted to equine) x 80,136 (\$ equivalent of 1 Extension professional FTE)].

## **Federal Goal 1**

### **FARM ASSET AND RESOURCE MANAGEMENT**

#### **Key Theme: Farm Financial Management**

**Kurt Guidry, Associate Professor; Gene Johnson, Professor; Gerald Giesler, Professor; John Westra, Assistant Professor; Ken Wegenhoft, Professor; Mike Salassi, Professor; Ken Paxton, Professor; Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

During a 5-year time period from 1998 to 2002, Louisiana agricultural producers had 4 years in which weather events caused significant economic damage. Weather-related reduced production was coupled with extremely low commodity prices. The financial difficulties resulting from this time span have required renewed emphasis to be placed on farm financial management. In order for producers of agricultural commodities to remain viable in an increasingly competitive market place, they must continue to improve skills and capabilities in efficient and effective farm management. Several programs have been continued to provide producers with the needed tools to continue to improve their competitive position.

Traditional programs have continued to stress improved farm and financial management by producers. Producer meetings discussing costs of production, workshops introducing proper record keeping, farm record books and inventory books, and one-on-one farm consultations continue to be a large component of program actions. Producer meetings stress issues such as renting versus owning equipment, the cost of field activities, and comparisons of conventional versus genetically modified varieties, among others. With the poor financial situation of the agricultural industry and with the new provisions of the Farm Bill, one producer meeting examined the percentage of base acres to be planted that would be most profitable for rice producers. A spreadsheet based decision tool was developed that allowed producers to examine those acres that were profitable, and determine the mix of rice acres which would provide the highest potential for profitability. This spreadsheet was utilized extensively by economists in individual farm consultations.

Individual farm consultations continue to be a valuable service provided through programming efforts. During the reporting year, a Farm Crisis Center was established to provide individual producers with assistance in developing farm and financial plans. Extension economists and county agents work one-on-one with producers in analyzing their current farming operation and looking for ways to increase profitability through changes in management, improved marketing strategies, and consolidating debt.

Farm record keeping continues to be a focus of program efforts. Parish and regional workshops on computerized record keeping were conducted. In addition, farm record books and inventory books were updated and improved and made available through the AgCenter webpage.

One of the most utilized activities conducted each year continues to be the development of enterprise budgets. Economists develop cost and return budgets for all of the major agricultural commodities in the state. These budgets are made available through parish extension offices as well as through the AgCenter webpage. These budgets are used extensively throughout the state by county agents, producers, agricultural lenders, and local and state agencies. In addition to the traditional commodity budgets, an effort is currently underway to develop cost and return budgets for the meat goat industry in the state. These budgets will be used as the foundation of further analysis in developing new market channels for this relatively new industry in the state.

Another activity conducted was the development of damage estimates caused from a tropical storm and hurricane that hit Louisiana within a month of each other. A survey of every parish in the state was conducted to determine the amount of production loss as well as any reduction in quality. Using this information, estimates of economic losses by parish, and by commodity were developed. A final report was prepared and was disseminated to media outlets, government officials, and state and federal agencies to stress the critical nature of the damage. These estimates help, in part, secure federal aid to the producers of the state. In a related event to the disaster damages, personnel within the department were instrumental in developing a process to distribute \$60 million in aid to sugarcane producers.

### **Program Impacts**

*Farm Management/Record Keeping* - Each year producer meetings and workshops are held throughout the state discussing various farm management and financial management issues. During the reporting year, an estimated 1,000 producers took part in these meetings. In addition, 27 producers took part in the FSA borrowers program which provides farm and financial education. Finally, during the reporting year, 61 requests were received for farm record books and over 200 books were made available.

*Individual Farm Financial Plans* – In response to the farm financial crisis in the state, a farm crisis network was established to provide one-on-one assistance to producers in making farm and financial plans. During the reporting year, approximately 97 producers took part in the program. For most of these producers, the program helped them to develop plans which, in part, enabled them to qualify for the needed financing for the upcoming crop year. For other producers, plans were devised to help transition them out of production agriculture. Without this assistance, the majority of these producers would have not received the financing needed and would have been forced out of production agriculture.

*Enterprise Budgets* – Each year, more than 150 enterprise budgets are developed for the major agricultural commodities in the state. These budgets are one of the most widely requested and utilized publications. The budgets are utilized not only by extension personnel but also by local

agricultural lenders, local and state government agencies, and national agricultural risk management centers. These budgets form the benchmark of most of the farm management work done by Extension.

*Disaster Estimates/Assistance* – During a two-month period, Louisiana agriculture was hit with a tropical storm, a hurricane, and two weeks of flooding rains. With low commodity prices already causing severe financial strain, the impact of these weather events was heightened. In an effort to garner support for federal assistance, estimates of the economic losses from these weather events were developed. It was estimated that economic losses surpassed \$500 million. These estimates were used extensively by legislators to stress the need for federal assistance. Disaster legislation was passed with \$60 million targeted to sugarcane producers. This assistance to sugarcane producers was, in large part, due to the need made evident through these disaster estimates. In a related event, an economist within the LSU AgCenter was responsible for developing the process in which \$60 million in federal aid was allocated to over 11,000 sugarcane tracts of land.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: Extension economists participate in the Southern Region Farm Management, Marketing, and Ag Policy committees, the Beltwide Cotton Conference, the National Rice Outlook Conference, the Tri-State Soybean Forum, the Delta Farm Management meetings, and regional and national association meetings. In addition, extension economists have been involved in regional workshops discussing farm record keeping and analysis software. It is estimated that 20% of the farm asset and resource management program was multi-state work, valued at \$31,349 (1.96 FTE x \$80,136 x .2).

Multi-function: The development of disaster estimates and enterprise budgets is done through joint research-extension consultations among agricultural production specialists in appropriate fields. It is estimated that 10% of the farm asset and resource management program was multi-function work, valued at \$15,675 (1.96 FTE x \$80,136 x .1).

## **Federal Goal 1**

### **FARM PROFITS THROUGH IMPROVED MARKETING AND FARM MANAGEMENT**

#### **Key Theme: Agricultural Profitability**

**Kurt Guidry, Associate Professor; Gene Johnson, Professor; Gerald Giesler, Professor; John Westra, Assistant Professor; Ken Wegenhoft, Professor; Mike Salassi, Professor; Ken Paxton, Professor; Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

Improvements in agricultural profitability can be initiated from several different sources. Potential areas of improvement are higher production through better variety selection and crop management, reduced costs through more efficient and effective use of inputs, increased marketing knowledge and performance, and diversified production to expand income streams. Several of these potential sources of improved agricultural profitability were the focus of extension programs during the reporting year. An agricultural marketing effort continued to center around market newsletters, producer meetings, individual farm consultations, and publications. Research verification programs stressed improved crop management and its direct relationship to production costs and profitability. A comprehensive agricultural policy program was conducted to help producers make a seamless transition to the 2002 Farm Bill. This was accomplished through statewide and regional meetings, development of spreadsheet-based software, individual farm consultations, and newsletters and other publications. Finally, a program to expand income opportunities for agricultural producers in the state was begun. Increased interest and demand for natural resource-based land use spurred a project that examined the potential and economic viability of leasing enterprises (hunting and fishing) either as supplemental income to agricultural revenue or as a substitute to agricultural production. Producer meetings have been conducted and plans are under way to develop operational budgets for these alternative enterprises.

The agricultural marketing program is designed to provide the most up-to-date information regarding market supply and demand factors for all of our major agricultural commodities. Developing successful marketing strategies is contingent on a producer establishing some view of future market movement. Critical to this is obtaining reliable market information. The marketing program attempts to provide this information that forms the basis of producers' marketing strategies. Producer meetings, monthly newsletters, e-mail updates, and publications are avenues through which this information is provided.

Research verification programs in soybeans and rice are designed to implement research-based recommendations in real world situations. This multi-function endeavor combines expertise from agronomists, weed scientists, entomologists, pathologists, engineers, and economists. During the reporting year, 10 rice producers and 7 soybean producers participated in the

program. These producers were visited once a week during the growing year at which time crop management recommendations were made. The linkage between efficient crop management and profitability is shown through detailed cost of production records kept on each field. In addition to providing a valuable learning experience for the producers and county agents involved in the program, results from the verification program are distributed throughout the state and are made available through the AgCenter webpage.

With the passage of the relatively more complex 2002 Farm Bill, there was a definite need by producers for assistance in making a seamless transition from the previous Farm Bill. In particular, assistance was needed with helping producers make fairly complex acreage and yield selections under the new Farm Bill. Along with regional and parish meetings designed at familiarizing producers with the new rules and regulations of the Farm Bill, a major program emphasis was the development of spreadsheet-based decision tools. The decision tool developed was one of the first in the country and was used widely by producers, bankers and lenders, and county agents in making tough decisions. The decision tool was also featured in several meetings at which economists worked one-on-one with producers in examining all of the acreage/yield options under the Farm Bill.

With low commodity prices and weather-related production shortfalls over the past several years, agricultural production was faced with difficult financial decisions. These difficult times stressed the need for producers to thoroughly examine their operations to look for areas in which efficiency could be increased, or to look for alternative opportunities. With low prices and tightening profit margins, producers no longer had the luxury of planting acres that could not, at a minimum, cover variable production costs. This required producers to examine their operation on an acre-by-acre basis, and to remove acres that were not profitable. In addition to streamlining their operations, producers also began to look for alternative opportunities for generating income streams. A program has been initiated that addresses both the issue of unprofitable acreage and alternative opportunities. Natural resource-based land use has been the focus of a program to help increase the profitability of agricultural operations. Specifically, the program has examined the potential of hunting and fishing leases as supplemental or alternative enterprises to traditional agricultural operations. Several meetings have been conducted to introduce the agriculture industry to opportunities in this area. The program is now at the stage of conducting surveys with existing enterprises to help develop a database of information. The program plans to use the information obtained in the surveys to develop comprehensive publications describing the how and why of establishing these enterprises. In addition, cost-and-return budgets will be developed to provide producers with information about the potential investment requirement possibilities and returns that could be expected from these alternative enterprises.

Program direction takes several avenues. An Extension Farm Management and Marketing Advisory Committee comprised of producers, agribusiness, agricultural consultants, and others from throughout the state provides the basis of the direction for the program. In addition to the underlying direction provided by the committee, Extension specialists participated in parish advisory meetings to gain insight as to the need of our clientele. Also, producers and county

agents have been allowed to review computer-based software, fact sheets, newsletters, etc. and provide their input prior to the final development of these materials.

### **Program Impacts**

*Agricultural Marketing* – Extension economists prepare monthly commodity outlook newsletters which are e-mailed to county agents and placed on the Agricultural Economics and Agribusiness Department's Farm Management webpage. County agents electronically forward these newsletters to producers as well as make printed versions available. It is estimated that over 3,000 producers and agribusiness firms received newsletters. The newsletters provided clientele with the latest supply and demand information and were cited by clientele as extremely helpful in making informed marketing decisions. In addition, county agents have expressed that the newsletters are very useful to them in providing a summary of market conditions so that they may stay informed about the markets that affect the commodities grown by their clients.

During the reporting year, Extension specialists participated in an estimated 30 meetings throughout the state covering various marketing topics. It is estimated that roughly 1,200 producers were in attendance. These meetings are typically concentrated in a January to March time period. The information provided by Extension specialists has been cited by clientele as extremely important in the crop enterprise selection decisions made by producers.

*Research Verification Program* – The goal of the research verification program is to show that following research based crop management recommendations and improved efficiency can increase profitability. Once again, the research programs showed that higher yields, lower costs of production, and ultimately higher profits can be attained. During the reporting year, producers in the rice research verification program had an average yield of 7,403 pounds and an average cost of production of \$276.80 per acre. This compares to the state average yield of 5,870 pounds (NASS estimate) and an average cost of production of \$293.75 per acre (LSU AgCenter Enterprise Budgets). The higher yield and lower per acre cost (\$1.26 per hundredweight) shown through the rice verification program results in an increase in profitability of \$120.47 per acre. Likewise, the producers enrolled in the soybean verification program had an average yield of 42.7 bushels per acre and an average cost of production of \$114.35 per acre. This compares to the state average yield of 34 bushels (NASS estimate) and an average cost of production of \$117.95 per acre (LSU AgCenter Enterprise Budgets). As with the rice verification program, the increased yields and lower cost (\$1.02 per bushel) associated with the soybean verification program show a potential increase in profitability of \$93.78 per acre. The results of both the rice and soybean verification programs indicate that if producers would follow recommended practices and improve crop management increased profitability can be achieved. Given the per acre improvement in profitability exhibited by the verification programs and given the 740,000 acres of soybeans and 450,000 acres of rice grown in the state, the verification programs provide a potential for improved farm income statewide of \$69 million for soybean production and \$54 million for rice production.



*Agricultural Policy* – The real impact made by the Farm Bill education program was the development of the spreadsheet-based decision tool to assist producers in making acreage and yield selections. This spreadsheet was one of the first developed in the country and was extensively used by the agricultural industry throughout the state. In addition, requests were made from producers in Texas, Missouri, Arkansas, Mississippi, and other states. The spreadsheet also spurred parish and regional meetings and one-on-one analyses for approximately 590 producers. For the producers who were provided one-on-one analysis, the average impact of selecting the optimal acreage/yield selection was approximately \$13,000 in additional government program payments. In addition to the spreadsheet, a regional Farm Bill meeting was conducted to provide information on new rules and regulations. This meeting was attended by 75 producers and others involved in production agriculture.

*Natural-Resource-Based Land Use* – Currently, 12 operators of natural-resource-based enterprises have been surveyed with plans underway to survey another 10 to 20 producers from various regions of the state. With the information gathered through the survey, publications and other educational curriculum will be developed to show the potential of these alternative enterprises in providing supplemental income to the traditional farming operations. Preliminary estimates indicate that these enterprises have the potential to add \$3,000 to \$5,000 annually in supplemental income to agricultural operations.

### **Source of Funds**

State and federal (Smith-Lever 3 b,c)

### **Scope of Impact**

Multi-state: Extension economists participated in the Southern Region Extension Outlook Conference, the National Rice Outlook Conference, the Tri-State Soybean Forum, and regional and national association meetings. In addition to their participation in these multi-state conferences, Extension economists also share much of the information used in development of curricula for marketing education programs such as the Marketing Agricultural Commodities (MAC) program and the FSA borrower training program. In addition, the spreadsheet-based decision tool on Farm Bill options was used throughout the United States by producers. It is estimated that 40% of this program was multi-state work, valued at \$125,396 (3.91 FTEs x \$80,136 FTE x .4).

Multi-function: Both the verification programs and the natural-resource-based land use project utilized the expertise of research and extension faculty in integrated activities. It is estimated that 60% of this program was multi-function work, valued at \$188,095 (3.91 FTEs x \$80,136 FTE x .6).

## **Federal Goal 1**

### **FRUITS AND NUTS**

#### **Key Theme: Agricultural Profitability**

**John Pyzner, Associate Professor, North Central Region, LSU AgCenter**

#### **Program Description**

Inputs received from the Louisiana Pecan Growers Association, Louisiana Pecan Producers Association, Mayhaw Growers Association, parish horticulture advisory committees, growers, and county agents were used to determine problems and concerns of fruit and nut growers. A fruit and pecan grower survey was conducted to determine grower knowledge and use of extension recommendations, grower contact with county agents and participation in the extension education program on fruits and nuts, and grower sources of fruit and pecan production information.

Stakeholders identified several problems: stinkbug control in pecans, alternate bearing in pecans; proper post harvest handling of pecans; fruit pest control; peach frost protection.

The Fruit and Pecan Extension Program used horticulture extension personnel, researchers, and county agents to assist fruit and pecan growers in the profitable production of fruit and pecans. Activities used in implementation of the program included grower meetings, field days, orchard tours, master gardener training, research/demonstration plots, newsletters, grower publication articles, mass media, farm visits, and telephone calls. Grower meetings, field days, orchard tours, and master gardener training meetings were well attended with over 800 attendees.

Collaborators in the program included extension and research faculty of the LSU AgCenter, Louisiana Pecan Growers Association, Pecan Producers of Louisiana, Mayhaw Association, Texas Peach Growers Association. Texas Pecan Growers Association and Georgia Pecan Growers Association have assisted the extension program by providing teaching opportunities for AgCenter personnel in their meetings, publications, newsletters and websites. Auburn University collaborated with a pecan alternate bearing research/demonstration plot. University of Georgia collaborated with Louisiana and nine additional states in the development of the Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide. Several growers have provided their orchards for research/demonstration plots and orchard tours.

#### **Program Impact**

A 2003 survey of commercial fruit and pecan growers indicated that 87% of growers obtained their crop production information programs only or mostly from extension programs. No growers indicated that all of their information came from non-extension sources. The survey

respondents indicated that 51 % frequently participated in extension activities and only 16% seldom participated.

The survey indicated that over 80% of respondents completely or mostly kept up with and followed extension recommendations on: managing insects (91%), managing diseases (91%), managing weeds (87%), tree/row spacing (85%), liming and fertilization (84%), pruning procedures (83%) and site preparation (83%). Three additional topics with good adoption rates (79%) were variety selection, soil testing and leaf analysis, and keeping crop production records (65%). The only topic of the 11 topics surveyed that had less than a 50% usage rate was irrigation (46%). This can be explained by the fact that 18 of the 20 respondents who indicated that they did not follow the Extension recommendation on irrigation also indicated that they did not have irrigation systems.

Fruit and pecan education meetings and training sessions had over 800 participants.

### **Source of Funds**

Smith-Lever 3 b, c (federal funds)

### **Scope of Impact**

Multi-State: Extension specialists, growers and researchers from Alabama, Arkansas, Louisiana, and Mississippi collaborate on the development and presentation of the Deep South Fruit and Vegetable Growers Conference and Trade Show. Texas Peach Growers Association had their 2003 annual meeting in Calhoun and Ruston, Louisiana in cooperation with Louisiana peach growers. Speakers from Alabama, Arkansas, Florida, Mississippi, South Carolina, and Texas participated in conferences and educational meetings for Louisiana fruit and pecan growers. The pecan specialist from Auburn University collaborated on a pecan alternate bearing study in Louisiana. The Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide was developed through contributors from AR, AL, FL, GA, LA, OK, NC, SC, TN and TX. A substantial portion of the ideas and information used in the fruit and pecan program in Louisiana is attributable to presentations, personal contacts, and publications from extension and research personnel from Alabama, Arkansas, Georgia, Florida, Mississippi, North Carolina, Oklahoma and Texas. Louisiana pecan extension and research personnel wrote articles for “The Pecan Grower” and “Pecan South” that are read by most commercial pecan growers in Louisiana and other pecan producing states. Louisiana participated with pecan extension and research personnel from Alabama, Florida, Georgia, Oklahoma and Texas in discussing cultural practices, pest management, and varieties at the National Pecan Scientists Meeting.

Approximately 30% of the program effort was devoted to multi-state collaboration. A total of 6.93 FTEs were devoted to the fruit and pecan program. Hence, the dollar value of the multi-state effort = \$166,603 (0.3 x 6.93 x \$80,136).

Multi-function: Integrated research-extension efforts are estimated at 90% of the total number of FTEs expended in the program. These efforts include research-extension collaboration in agent training, formulation of recommendations, publications, and field trouble shooting during the growing season. The dollar value of these multi-function efforts = \$449,808 (0.9 x 6.93 x \$80,136).

## **Federal Goal 1**

### **HONEYBEE MANAGEMENT**

#### **Key Theme: Agricultural Profitability**

**Dale Pollet, Professor, Department of Entomology, LSU AgCenter**

#### **Program Description**

The stakeholders in the honeybee management program are Louisiana beekeepers and anyone who enjoys a good meal and the wildlife we have in the state. Honeybees in Louisiana are responsible for an economic impact of \$400,000,000+. This is through pollination, honey, services, wax, and bees and bee equipment. Louisiana beekeepers are primarily hobbyists, with about 60 to 70 commercial beekeepers. Bees help to pollinate about 80% of the food commodities and 100% of the grasses, berries, and other foods that the wildlife and domestic animal population consumes and the plant materials that beautify the state. Honeybees have various problems which must be managed or the system will become nonfunctional.

The honeybee laboratory in the state is doing work to address the problems with honeybees through genetic solutions. The lab has an APHIS approved isolated quarantine and mating station on Grand Terre Island. Ongoing projects in conjunction with resistant stocks include varroa and tracheal mite resistant bees, SMRD trait: this eliminates the reproduction of female varroa mites in colonies and tracheal mite resistance and susceptible stock for selecting for high tracheal mite resistance or incorporating germ plasma into their stocks.

On top of the tariffs imposed on foreign honey from China and Venezuela, USDA detected trace amounts of chloramphenicol, an antibiotic not approved for use in food-producing animals. This work has led to additional scrutiny and limited imports.

A \$10,000 economic aid package from the State Department of Agriculture and Forestry has been used to develop an exhibit for use at the state fair and other events, speakers for the state meeting, a Louisiana Beekeepers Association web site, and marketing and promotion programs. The funds were made available as a result of data submitted by the LSU AgCenter on the value of pollination services by honeybees in the state.

The USDA Bee Breeding and Physiology Laboratory personnel continue to work with the beekeepers, the LSU AgCenter, and the Louisiana Department of Agriculture and Forestry to

improve the programs on mite control through genetics and the Russian queens. Additional lines have been released this year and several lines will be released in future years. Work continues to evaluate new lines for managing the mites, improving honey production, gentleness, and early buildup of colony strength. Early buildup is critical to the needs of Louisiana beekeepers to meet honey flows. Minor problems are with queen acceptance. Honey production was reduced by 20-25% this year even with early moisture. Heavy rains during the tallow flow eliminated any production this year. Small hive beetle has expanded its range and is now found in several parishes. Survey and treatments of infested areas continue. Wax moth management with Intrepid was positive but limitation on the method of application has slowed labeling. A quick and easy method of treating combs is needed before it will be available. The bacterium used to control these pests is still being marketed by Valent. Calls have been made to evaluate the possibility of wax moths in bee hives being added to the label. To date no answer!

The increase in the wild honeybee population has led to an increase in swarms and bee colonies in walls. This has reestablished the need for beekeepers to remove honeybees in these precarious situations and increase the public relations with the general public.

African honeybees are not here yet but swarms collect are beginning to show genetic makeup of the African line. African honeybees are in two Texas counties that border Louisiana near Shreveport.

Interest continues in beekeeping as a small business and a retirement activity. Red Stick Honey Company continues to grow and include more and more local beekeepers in their honey bottling operation. The sales and distribution of their product continues to expand around the state. The leasing of colonies for pollination services continue to be an added plus for beekeepers. Most of the leases are in vegetable and small fruit production. This adds value to the industry in addition to the \$400,000,000+ in free pollination services the industry provides the state each year.

The 4-H program continues in popularity through the Honeybee Essay contest. Selection of winners each year becomes more difficult as the students learn more and more each year thanks to the many beekeepers and the local clubs.

Bee clubs across the state are still very active. They support beekeeping through the school systems, fairs, demonstrations, lectures, and inviting classes to the apiary. The clubs continue to have good competition at the State Fair which helps promote sales and interest in honey and beekeeping. The colors and flavors of local honey still amaze the public. These exhibits and competitions have changed the minds of many people about what honey tastes like and what colors and flavors they prefer. The public is highly impressed with the great number of floral sources we have and how each source differs.

There were 63,214 contacts made in this program. Most were farm visits, meetings, and mass media.

Direct contact with mass media (TV, radio, and newspaper) programs and educational publications for agents and beekeepers are important aspects of the program. Exhibits are developed and shown in parish libraries, fairs, clinics, and festivals. Exhibits are also used by the bee clubs for presentations. Videotapes, books, slide sets, and teaching aids for schools and clubs are purchased and used by agents, beekeepers, teachers, organizations, the Department of Agriculture and Forestry, and individuals to promote the industry. USDA Bee Lab personnel assist by supplying observation hives when needed and Louisiana Department of Agriculture and Forestry personnel assist with speakers, pamphlets, and other materials.

Each beekeeping club publishes a monthly newsletter and corresponds with other clubs to keep abreast of happenings in their respective locations and relevant situations in industry.

Clubs have assisted with the educational programs by presenting information at schools, the state fair, at festivals, and at parish functions. They have directly assisted the 4-H essay writers by giving interviews and tours of apiaries as they collect information for their manuscripts. Beekeepers have assisted neighbors and governing bodies with removal of bees and the collection of swarms. The clubs have assisted young people interested in beekeeping as a hobby by showing them how to work hives and extract honey allowing them to be better beekeepers.

USDA Bee Breeding and Physiology Lab personnel assist in the training and education of beekeepers, children, and the general public. Sixty-four children from 31 parishes submitted essays for the Honeybee Essay contest sponsored by the American Beekeeping Federation. The state beekeepers association invites the top three winners of the contest to the state meeting and asks the first place winner to read their essay. The association presents plaques to each of the top winners and the LSU AgCenter presents the three winners with a monetary gift for their efforts.

In conjunction with the Louisiana Department of Agriculture and Forestry the LSU AgCenter is developing a certification program to assure that beekeepers will be safe and will properly use management tools (pesticides) to control pest problems in the hive. This certification will allow beekeepers to purchase the needed materials and show that they are qualified to use them.

Beekeepers have gone back to removing bees from walls and collecting swarms. Increases in the honeybee populations and swarming have created a need for the bee removal service again. This assists the beekeeper with public relations and gives them an opportunity to answer questions to ease the public about African honeybees.

### **Program Impact**

Registration of beekeepers with the Louisiana Department of Agriculture and Forestry continues to improve. Beekeepers' management practices have improved, thus reducing problems with insects, diseases, and rodents. These beekeepers realize a savings of \$70 per hive for a savings of \$3,066,000. The honey crop this year was short due to a 25% decrease in the rainfall. However, the increase in price to \$1.35 per pound helped beekeepers do well despite a reduction

in production to about 3.75 million pounds. Some 2,600 hives were leased for pollination services, providing an additional \$78,000 income. Overall pollination services for commodities, native plants, and grasses in Louisiana is valued at over \$400,000,000+.

The Russian queen breeding program continues to be active and productive. Five new lines were released this year with additional lines in the years to come.

Chef John Folse continues his program with honey bees. He has set up his hive at White Oak Plantation and utilizes his production to make ice cream, desserts, and other dishes for his restaurants. His discussions of honey on his cooking programs have given the industry a big boost in sales and marketing. He spoke to the association's state convention in Baton Rouge this year. This is the second time Chef Folse has done so. He also donated a signed cookbook for the silent auction to help support the association.

Contacts with companies that market the Bt that was used for wax moth control have been made to encourage them to label the material for management of these pest. This material was accidentally canceled when the initial company was purchased by Zoecon.

#### **Source of Funds**

Federal, Smith-Lever (3 b, c)

#### **Scope of Impact**

Multi-state: It is estimated that 75% of the honeybee management program is multi-state work. The dollar equivalent of multi-state work is \$30,051 (.75 x .5 x \$80,136).

Multi-function: It is estimated that 100% of the honeybee management program is multi-function work. The dollar equivalent is \$40,068 (1.0 x .5 x \$80,136).

#### **Federal Goal 1**

### **LOUISIANA RICE RESEARCH VERIFICATION PROGRAM**

#### **Key Theme: Agricultural Profitability**

**Johnny Saichuk, (Agronomy) Professor, Southwest Region, LSU AgCenter**

#### **Program Description**

The Louisiana Rice Research Verification Program (LRRVP) is a program designed to demonstrate the most cost-efficient production of rice, increase confidence of rice growers in extension and research recommendations, increase confidence of county agents and specialists in their recommendations, educate county agents and growers in all aspects of rice production,

develop an economic data base for rice production, and relay “real world” conditions to researchers in an effort to enhance scientific studies.

### **Program Impact**

The program has met or is achieving all of its intended goals and has expanded in scope each year of the program. Education of county agents, both those directly involved and others through training programs, has been a marked success.

Other projects continue to evolve from the verification program. A five-year water use study was funded after realizing through data collection efforts that precise information on water use was not available. Studies to define the cause of and develop a solution to an as yet unnamed disorder commonly called “Calcasieu disease” have also developed from encountering this problem in Calcasieu Parish, Southwest Louisiana, in verification fields.

Threshold values and scouting procedure for use of synthetic pyrethroids to control the rice water weevil were scrapped and new techniques developed when it was found that the procedures did not work in verification fields. It is expected that this trend will continue.

### **Source of Funds**

Louisiana Rice Research Board (State)

### **Scope of Impact**

Multi-state: Although other states are not specifically involved, this program is similar to one in Arkansas. Mississippi, having noted the success of Louisiana’s program, is investigating the possibility of setting up their own program. Information exchange between rice specialists in each state adds to the body of knowledge concerning rice production. The greatest percentage of time devoted to the program is provided by extension personnel even though researchers are intimately and regularly involved. This makes the program a multi-function effort.

Multi-function: It is estimated that 35% of the total number of FTEs expended in the program is multi-function. These efforts include research-extension collaboration in agent training, formulation of recommendations, publications, and trouble shooting during the growing season. The dollar value of the multi-function effort is \$ 98,167 (3.5 FTEs x \$80,136 per FTE x .35).



## **Federal Goal 1**

### **MANAGING RISK IN A CHANGING ENVIRONMENT**

#### **Key Theme: Risk Management**

**Kurt Guidry, Associate Professor; Gene Johnson, Professor; Gerald Giesler, Professor; John Westra, Assistant Professor; Ken Wegenhof, Professor; Mike Salassi, Professor; Ken Paxton, Professor; Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

Agricultural producers face many risks and challenges each and every year. The ability to manage those risks effectively and efficiently can often be the difference between financial success and financial ruin. A majority of producers have very limited skills and knowledge in dealing with risky situations. Managing risk is a very broad issue that encompasses several areas of concentration. Activities can focus on anything from managing market risk to human resource management. While traditional forms of risk management continue to be a focus of educational programming, some non-traditional forms have been addressed during the reporting year.

Low commodity prices and production shortfalls have placed much more emphasis on producers making informed decisions in marketing their crops. Producer meetings have been conducted to teach both row crop producers and livestock producers various marketing alternatives that can help manage market risk. These meetings focused on utilizing futures contracts and futures options as tools to minimize exposure to price fluctuations. In addition, the meetings focused on using these tools, either alone or in combination with other tools, in developing successful marketing plans.

In a continued effort to provide comprehensive marketing education, the Marketing Agricultural Commodities (MAC) program continues to be offered state-wide. The MAC program consists of eight 3-hour seminars devoted to farm management and marketing education. With low commodity prices and a new farm bill, there were limited opportunities to conduct an MAC program during the reporting year. However, plans are under way to update the MAC curriculum and to again heavily advertise its availability throughout the state.

In response to the severe financial stress of the entire agricultural industry, an Agricultural Crisis Summit was conducted. In addition to attempting to provide producers with information on how to most effectively handle current financial difficulties, the summit allowed for feedback from the agricultural industry as to the areas of focus needed in both research and extension that are critical to the short-run and long-run viability of the industry.

One of the industries in the state that has been hit hardest by low commodity prices is the catfish industry. Low prices and climbing input prices have devastated what was once a very promising industry in the state. One program that was initiated has attempted to provide producers with information on federal programs that could provide some financial relief. The Trade Adjustment Act is a federal program that provides financial aid to producers of commodities adversely affected by increased imports. In an effort to assure that producers were aware of this new program, two producer meetings were conducted. In addition, newsletters and press releases were distributed to producers to make them aware of the program.

While the above-mentioned programs targeted traditional areas of risk management, a new program initiative during the reporting year addressed a non-traditional area of risk. With the outbreak of West Nile virus, there was a definite need to educate the citizens of Louisiana and government officials on the importance of developing organized mosquito abatement programs in managing this very real health risk. With additional funding from the State Department of Health and Hospitals, a comprehensive program was implemented to develop a set of guidelines for initiating a mosquito abatement program. This program combined the expertise of entomologists and economists in developing a guide that could be used by parishes in setting up and operating their own mosquito abatement program. Along with the publications developed, the program entailed 8 regional meetings and 13 individual parish consultations. The meetings were designed to introduce parish officials to the issues in developing a comprehensive mosquito abatement program. Individual parish meetings were conducted to provide one-on-one assistance in developing plans to establish an abatement district.

### **Program Impact**

*Marketing/Ag Crisis Summit* – In response to the devastation caused by low commodity prices and weather events, an Agricultural Crisis Summit was held to address both the short-term and long-term issues surrounding the survivability of the agricultural industry. Speakers and presenters from across the nation participated in the Summit. An overflow crowd of over 300 people from the agricultural community participated. This meeting helped establish areas of priority for assuring that the agricultural industry in the state remained economically viable.

In addition to the Summit, approximately 10 meetings were held throughout the state to introduce producers and cattlemen to marketing alternatives and strategies that could be used to manage market risk. Approximately 300 producers took part in these meetings.

*Ag Policy-Catfish* - The Trade Adjustment Assistance (TAA) Program offers financial assistance to producers of commodities who have been adversely affected by increased imports. With current catfish production struggling due to low commodity prices, the need to make producers aware of this potential assistance was critical. Two producer meetings were conducted to make producers aware of the TAA program and to provide information on the steps needed for producers to become eligible. Approximately 50 producers or nearly 60% of the approximately 89 commercial producers in the state were contacted through this meeting. In addition, newsletters and press releases were developed to disseminate information on the program.

Efforts are now currently underway to develop the educational training mandated for producers to be eligible for program payments. With the estimated payment rate of \$0.003 per pound and the estimated 61 million pounds of catfish produced in the state, the implementation of the TAA program could mean a potential \$184,000 to the state's catfish producers.

*Mosquito Abatement Program* – The Louisiana Mosquito Abatement Plan (LAMAP) was a comprehensive program aimed at providing education and assistance to parish officials about the development of mosquito abatement districts. Eight regional meetings were conducted with more than 300 participants in the meetings. In addition, one-on-one assistance was provided to 13 parishes to help them develop their own programs. The LAMAP program also attempted to assist parishes in obtaining federal grant dollars that would be used to start their own districts. Based on the work done by the LAMAP program, over 40 parishes submitted preliminary plans and were awarded an average of \$10,000 in startup funds. These parishes have until June 2004 to provide all the deliverables of the grant and receive their funds. The LAMAP program continues to work with these parishes as they finalize their plans.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: Extension economists participated in the Southern Region Farm Management, Marketing, and Ag Policy committees, the Beltwide Cotton Conference, the National Rice Outlook Conference, the Tri-State Soybean Forum, Delta Farm Management meetings, and regional and national association meetings. The agricultural crisis summit brought in speakers and presenters from all across the nation. Finally, the Trade Adjustment Assistance program is being conducted as a regional effort with extension personnel from throughout the southern region involved in curriculum development. It is estimated that 40% of the risk management program was multi-state work, valued at \$20,900 (.65 FTE x \$80,136 FTE x .4).

Multi-function: Research and Extension faculty from various disciplines collaborated in activities of the mosquito abatement program and the trade adjustment assistance programs. It is estimated that 50% of the risk management program was multi-function work, valued at \$26,124 (.65 FTE x \$80,136 x .5).

## **Federal Goal 1**

### **PASTURE, FORAGE, AND SMALL GRAINS**

#### **Key Theme: Agricultural Profitability; Grazing**

**Ed Twidwell, Professor, Department of Agronomy, LSU AgCenter**

#### **Program Description**

Extension agents throughout the state with an interest in livestock and crop production normally have an advisory committee comprised of various types of stakeholders, including producers. At the advisory committee meetings, stakeholders provide input as to what topics and programs in the forage and small grain areas that they would like to see addressed. This input was collected by the extension agents, and then passed on to various subject matter extension specialists.

As a result of stakeholder input, pasture weed control, and new forage and wheat varieties were identified as problems to be addressed.

Field demonstrations involving pasture weed control were conducted at 15 locations throughout the state. Various herbicide treatments were applied during April through August, and then the test plots were visually rated for amount of weed control. Tours of these demonstrations were held at ten of the test locations. Stakeholders were able to evaluate and compare the effectiveness of various weed control treatments.

Eight demonstrations involving forage varieties were conducted. This involved six ryegrass variety demonstrations and two bermudagrass variety demonstrations. Field tours were held at six of these test locations. Stakeholders were able to observe the variety plots and compare the characteristics of the various forage varieties.

Three wheat variety demonstrations were conducted. Field tours were held at two of the test locations. Stakeholders were able to observe the variety plots and compare the characteristics of the wheat varieties. These wheat demonstration plots were harvested for yield determination and test weight.

In all of the forage and small grain demonstrations that were conducted, stakeholders were able to take the results of the information presented and apply it on their own farm or ranch.

University of Louisiana at Lafayette collaborated in the program to provide a test location and some labor to conduct a ryegrass variety demonstration.

McNeese State University collaborated in the program to provide a test location and some labor to conduct a pasture weed control demonstration.

LSU AgCenter/Extension faculty and labor coordinated, conducted, and promoted the demonstrations.

### **Program Impact**

Stakeholders used the information from the pasture weed control demonstrations to assist them in selecting the proper means of controlling weeds on their farm or ranch. Control measures discussed included chemical and mechanical treatment options. Stakeholders were also educated on how to read and follow herbicide labels properly. As a result of the program, stakeholders are expected to use more efficient and cost-effective means of controlling weeds in their pastures.

Stakeholders used the information from the forage variety demonstrations to assist them in selecting the proper varieties for use in their operation.

Stakeholders used the information from the wheat variety demonstrations to assist them in selecting adapted varieties for their locale.

Educating stakeholders on how to select varieties based on yield performance and disease resistance is a vital component of the program.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: None

Multi-function: Multi-function (integrated research-extension) efforts are estimated at 30% of the total number of FTEs expended in the program. These efforts include research-extension collaboration in agent training, formulation of recommendations, publications, stakeholder meetings, and responding to stakeholder questions and problems. The dollar value of this multi-function effort = [.30 (estimated multi-function component of program) x 8.20 (FTEs devoted to pasture, forage, and small grain program) x \$80,136 (\$ equivalent of 1 Extension professional FTE)] = \$197,135

## **Federal Goal 1**

### **PESTICIDE APPLICATOR TRAINING**

#### **Key Theme: Pesticide Application**

**Mary Grodner, Professor, Department of Entomology, LSU AgCenter**

#### **Program Description**

Meetings, conferences, and workshops were held throughout the state for both commercial and private pesticide applicators to allow them to become certified or to maintain their certification as pesticide applicators. Fifteen conferences were held where commercial applicators could acquire recertification. The county agents in each parish held recertification sessions for the farmers in their parishes.

#### **Program Impact**

This program has been conducted since about 1975 and serves all pesticide users in Louisiana. Approximately 5,000 pesticide applicators received this educational program during the year.

#### **Source of Funds**

EPA Pass-Through

#### **Scope of Impact**

Multi-state: Fifty percent of the educational materials used in this program are in part or in full, from other states but were developed in previous years and are reprinted or revised as needed. It is estimated that 15 to 20% of ideas about how to conduct this program have come from attending various meetings on the regional or national level. Two multi-state meetings were conducted which are publicized in Arkansas & Mississippi so residents in those states may acquire recertification in those two categories. Of course, residents of other states are always welcome at the conferences. These three states are working together to develop an Ornamental and Turf Pest Control Study Guide. Oklahoma is also working with us on the Ornamental and Turf manual. Approximately 15% of 3.6 FTE was devoted to this multi-state effort for a dollar equivalent of \$43,273 (15% x 3.6 x \$80,136).

Multi-function: None

## **Federal Goal 1**

### **SOYBEANS AND GRAIN PRODUCTION**

#### **Key Theme: Agricultural Profitability**

**David Lanclos, Assistant Professor (Soybean, Corn, Grains, Sorghum), Central Region, LSU AgCenter**

#### **Program Description**

During the year, several parish level committees or advisory groups had meetings to steer program development for soybean and feed grain extension programs. Surveys were used from the previous year as supplemental steering mechanisms.

Potential program issues included more in field testing of soybean and feed grain varieties/hybrids due to the ever increasing number of varieties/hybrids that are available to producers commercially; better disease management systems; evaluation of lowering the stinkbug threshold numbers when insects are allowed to attack the crop for long periods of time (soybeans only); irrigation management and timing as well as continued implementation of the soybean verification program.

From these directives, a comprehensive education program for soybean and feed grain producers was implemented. The performance goals of the programs were to increase yields and thus profitability of Louisiana soybean and feed grain producers by following recommended practices provided by the LSU AgCenter. The education programs provided information on the importance of proper variety/hybrid selection, agronomic practices involving tillage, plant populations, irrigation, fertility and pest management in regard to herbicides, insecticides and fungicide applications. The following educational activities were conducted during the year:

- Seven agent training sessions were conducted to inform LSU AgCenter personnel working directly with soybean and feed grain production of the latest recommended practices.
- The state soybean and feed grain specialist and parish extension agents conducted 67 on-farm demonstrations in the major feed grain growing parishes.
- Twenty on-farm research projects were conducted jointly with faculty of the LSU Agricultural Center's Experiment Station.
- Fifty-two educational meetings and eleven field days were conducted to keep growers informed of recommended practices.

- An as-needed newsletter primarily focused on pest management was distributed to producers, consultants, extension personnel and others involved in production agriculture. In addition to this, the state specialist began distributing an electronic newsletter primarily focusing on agronomic practices in addition to the latest research that is being generated by LSU Agricultural Center Experiment Station personnel. This electronic newsletter kept clientele informed of these facts as well as current and future events occurring in the AgCenter and around the state.
- Mass media programs were produced at least weekly to keep clientele informed of anything that was pertinent to soybean production during the season.
- Specialists as well as county agents were interviewed or wrote news articles pertaining to soybean issues during the growing season.
- The LSU AgCenter soybean, corn, and grain sorghum production web pages were updated by the soybean and feed grain specialist in an attempt to modernize the site and make it more user friendly.
- The state soybean and feed grain specialists (Agronomy, Entomology and Pathology) collaborated with other mid-south specialists and attended professional working group sessions to insure that Louisiana growers are receiving the latest information available.
- The state soybean specialist participated in a multi-state mock soybean rust study to evaluate the potential ability for aerial applicators to be able to spray for the disease if and when it enters the United States.

Collaborators in the soybean and feed grain education program included extension and research faculty within the cooperating land grant system (Louisiana State University and A&M College and Southern University and A&M College); USDA agencies; state environmental agencies; Louisiana Farm Bureau Federation; Louisiana Soybean Association; Louisiana Association of Agricultural Consultants; Louisiana Department of Agriculture and Forestry in addition to private industry personnel.

### **Program Impact**

- Over 4,800 producers, consultants, and industry personnel attended field days and educational meetings.
- Training sessions for LSU AgCenter personnel were attended by extension agents and other LSU AgCenter faculty working in soybean and feed grain production.
- State specialists and extension agents made presentations at local, multi-state, and national meetings.



- Thirty-four agents and/or specialists attended multi-state or national meetings.
- Extension agents and/or specialists conducted 67 on-farm demonstrations.
- Approximately 70% of Louisiana soybean and feed grain producers follow LSU AgCenter recommendations.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)  
 Louisiana Soybean and Feed Grain Research and Promotion Board  
 Private Industry grants

### **Scope of Impact**

Multi-state: Participation in and information sharing from multi-state conferences as well as national meetings with a total multi-state effort valued at \$254,132 (12.7 FTEs x \$80,136 per FTE x 0.25).

Multi-function: Researchers and extension specialists collaborated on preparing publications, development and training of agents, consultants, agbusiness personnel, and producers for a multi-function effort valued at \$1,017,727 (12.7 FTEs x \$80,136 per FTE x 1.0).

### **Federal Goal 1**

#### **WEED SCIENCE EDUCATION PROGRAM**

#### **Key Theme: Agricultural Profitability**

**Steve Kelly, Assistant Professor (Weed Science), Northeast Region, LSU AgCenter**

#### **Program Description**

Reduced tillage practices are increasing as input costs such as fuel, labor, and equipment purchases and repair tend to increase. By reducing the amount of tillage done to cropland, producers can not only reduce input costs, but increase soil tilth and moisture permeation, and reduce erosion. A key component in reduced tillage is vegetation management prior to crop planting. Herbicide selection and application timing is critical in this system in order to maximize weed control and reduce potential insect pests.

A comprehensive extension education program for crop producers was implemented. The goal of this program was to demonstrate the critical need for proper weed identification and herbicide selection for controlling the specific weeds present. The diverse weed spectrum present in

Louisiana makes proper weed identification imperative. The following activities were completed:

- Two agent-training sessions were conducted to inform LSU Agricultural Center personnel, working in crop production, of the latest weed control recommendations and new herbicides (14 agents).
- The state weed specialist in cooperation with county extension agents and private consultants conducted six on-farm demonstrations specifically targeting various weed spectrums to demonstrate the importance of proper herbicide selection based on the weeds present. Both new and existing herbicide programs were implemented.
- A cotton newsletter was distributed to producers, consultants, and agribusiness personnel throughout the growing season via electronic mail (300 contacts) and printed media (200 copies). The newsletter contained updates on recommendations and kept clientele informed of current events.
- Six news articles were written and distributed.
- LSU AgCenter weed control publications were revised, updated, and made available on the LSU AgCenter website.
- County agents, producers, and consultants were made aware of new herbicides, label changes, etc. through the use of electronic mail.
- Program collaborators included other educational institutions within the state; Extension Service and Research faculty within the region's land grant institutions (University of Arkansas, University of Tennessee, Mississippi State, University of Missouri); USDA agencies; Louisiana Farm Bureau Federation; Louisiana Cotton Producers Association; professional organizations; Louisiana Department of Agriculture and Forestry; private industry; Cotton Incorporated.

### **Program Impact**

- Over 2,000 farmers, consultants, and industry personnel attended the field days and educational meetings.
- Training sessions for LSU AgCenter personnel were attended by 95% of the Extension agents working in row crop production programs.
- Extension specialists made 17 presentations at parish crop production meetings.
- Extension specialists made six presentations at national meetings.
- 12 extension agents and/or specialists attended national meetings.
- Extension agents and/or specialists conducted six on farm demonstrations.
- Producers gained knowledge of weed identification, herbicide selection, and spray drift-reducing technology.

- More than 3,200 people visited the “2003 Suggested Weed Control Guidelines” website for weed control information.

### **Source of Funds**

Smith-Lever 3 b, c  
Private industry

### **Scope of Impact**

Multi-state: Cotton Pest Management Strategic Plan – 3 FTEs with a 5% effort was devoted to the program for a total multi-state effort of \$12,020 (3 FTEs x \$80,136 per FTE x .05).

Weed Workers Meeting - 4.5 FTE's with 20% effort were devoted to the program for a total multi-state effort of \$72,122 (4.5 FTEs x \$80,136 per FTE x .20).

Total multi-state work in the weed science education program was \$84,142 (\$12,000 plus \$72,122).

Multi-function: Researchers and extension specialists collaborated on the development of publications, training of agents, consultants, agribusiness personnel, and farmers for a 100% multi-functional effort of \$1,568,261 (19.57 FTEs x \$80,136 per FTE x 1.0).

**GOAL 1**  
**RESEARCH SUMMARIES**

## **Federal Goal 1**

**Title of Research Project: Integrated Weed Management in Louisiana Sugarcane**

**Key Theme: Agricultural Competitiveness, Agricultural Profitability**

**James L. Griffin, Professor, Department of Agronomy and Environmental Management, Kenneth Gravois, Professor and Resident Coordinator, St. Gabriel Research Station, LAES, LSU AgCenter**

**Issue:** Estimates of annual yield losses due to weeds in Louisiana sugarcane with use of current weed management practices are \$16.5 million. From an economic standpoint, the need to control input costs and to avoid the application of inappropriate or unnecessary herbicides has perhaps never been greater. The primary role of weed scientists is to conduct research aimed at development of cost effective weed control programs. Weeds can be controlled with integrated pest management (IPM) practices including mechanical cultivation, crop rotation, and herbicides. Louisiana producers currently use all these practices, but herbicides serve as the foundation for successful weed control programs. Weed management decisions are complicated by the multi-species nature of the weed population in most fields. The efficacy of herbicides and other suppressive tactics depends upon weed species and environmental conditions. Since herbicide discovery is customarily not a role of the university, researchers are dependent on agricultural chemical companies to provide new products and technologies for evaluation. Few herbicides are developed solely for use in sugarcane due primarily to the small acreage compared with other crops in the United States. AgCenter researchers often take the lead role in evaluating new herbicide technology. Crop safety, flexibility in application timing, and broad spectrum weed control are desirable traits of any herbicide. Our research program focuses on these areas and is a cooperative effort with the sugarcane breeding project, USDA, and the American Sugarcane League.

**What was done:** Research related to weed management in sugarcane has evaluated 1) sugarcane response and weed control with herbicides applied at planting, in spring, and at layby; 2) red morningglory control with preemergence and postemergence weed control programs at layby and in late season; 3) red morningglory biology to include factors affecting seedling emergence and seed production, and competition with sugarcane; 4) fallow weed control programs; 5) reduced tillage weed control programs; and 6) harvest aids.

**Impact:** Research has contributed to the registration and availability of new herbicide technologies in sugarcane that are cost effective. Integration of weed control tactics in sugarcane have helped to maintain high yield and profitability. The adoption of reduced tillage practices is expected to further reduce cost inputs to the grower. Such programs involving conservation tillage practices will also have positive environmental implications.

**Sources of funding:** American Sugarcane League, Hatch

## Federal Goal 1

### Title: Integrated Pest Management of the Mexican Rice Borer in Louisiana and Texas Sugarcane and Rice

#### Key Theme: Integrated Pest Management

Thomas Reagan, Professor, Department of Entomology, LAES, LSU AgCenter

**Issue:** The Mexican Rice Borer (MRB), *Eoreuma loftini* (Lepidoptera: Crambidae), has caused up to 50% yield loss in some Texas rice fields. When the insect moved into the Lower Rio Grande Valley sugarcane in 1980, many fields were completely destroyed. Experiments with the current Louisiana sugarcane varieties have shown far greater damage. The geographical range of the insect in Texas expanded into the counties of Harris and Austin in 2001, and Galveston in 2002. Although the MRB has not been detected in Louisiana, it has been found only 50-60 miles from the sugarcane production area near Beaumont, TX (sugarcane that in recent years is transported into Iberia parish, LA, for processing). The invasion of Louisiana sugarcane fields in the near future is highly probable. Management strategies are needed to prevent MRB populations from reaching economic thresholds in sugarcane and rice fields in Louisiana and Texas.

**What was done:** Cooperative studies on the MRB between the LSU AgCenter and Texas A&M Research Stations at Beaumont and Weslaco continued in 2003. Greenhouse experiments involved oviposition tests on several Louisiana sugarcane varieties (LCP 85-384 and HoCP 85-845) under drought and non-drought stressed conditions. The increased oviposition on both the resistant (HoCP 85-845) and the susceptible (LCP 85-384) varieties under stress conditions was correlated with the increased number of dry leaves under stress. Oviposition was found to occur exclusively on dry leaves, a major physical component of oviposition preference. Free amino acid analyses are also under way to determine a chemical component. Oviposition tests on several rice varieties were also conducted in 2003 and will be completed in 2004.

A field experiment conducted at Ganado, TX, assessed the relative contribution and compatibility of irrigation, variety (LCP 85-384 and HoCP 85-845), and insecticide suppression (tebufenozide) on the control of MRB populations and crop injury. Data collected in December 2003 showed that under high levels of MRB infestation, the use of irrigation, resistant varieties and insecticide contributed substantially to control. Continued monitoring of adult populations also involves extensive participation from personnel of the Texas Department of Agriculture and the Louisiana Department of Agriculture and Forestry.

**Impact:** Based on availability of current research findings, several management practices will be required to reduce areawide MRB populations and suppress pest infestations in sugarcane and rice. Host plant resistant studies in sugarcane indicate that several variety resistance components will be necessary to reduce damage and pest population pressure. Based on resistance observed in HoCP 85-845 and CP 70-321, a discovery of a likely chemical component involved in plant

resistance physiology will be complemented by a reduction in dry leaf material on resistant varieties. Management practices which minimize plant stress and the resultant increase in dry leaf material will play a major role. Preferred oviposition on stressed sugarcane is thought to have a major impact on the breakdown of resistance under stressed conditions. The use of insecticides to control MRB infestations in sugarcane will likely not have a very permanent and effective role due to the unique behavior of larvae to mine leaves and bore quickly into the plant after egg hatch. However, the potential of biological control, especially from naturally occurring arthropod predators such as ants and spiders, is also foreseen.

Studies in rice at Ganado, TX, indicate that variety resistance will also play a major role in MRB and other stem borer control, and potential areawide population reductions. Variety XL-8 was more resistant than Cocodrie, which was substantially better than Cypress. However, under heavy pest populations, yield of Cocodrie was extremely reduced. Probably due to the more delicate plant physical characteristics exposing MRB better to insecticide sprays, the insecticide management component will likely play a major role in the suppression of MRB stem borer infestations in rice.

**Sources of funding:** USDA-CSREES (Southern Region IPM Grant, Critical Issues Grant, Crops at Risk Grant); Hatch, American Sugarcane League, State

### **Federal Goal 1**

**Title: Application of Molecular Markers to the Improvement of Southern U.S. Rice**

**Key Theme: Plant Genomics, Plant Germplasm**

**Herry S. Utomo, Assistant Professor; Steve Linscombe, Professor; and Qi Ren Chu, Associate Professor, Rice Research Station, LAES, LSU AgCenter**

**Issue:** Molecular markers can be used as one of the breeding tools in developing new rice cultivars. The full potential of marker technology, however, has been limited by the relatively high cost of marker detection. The development of a cost-effective marker detection system with medium/high throughput is critical for successful integration of marker technology into a real cycle of breeding processes. Using well characterized markers that have been proven to work in U.S. germplasms, marker-assisted breeding has been initiated to develop durable blast resistant lines. Markers are also being used to evaluate the off-type problem that has been observed in several seed foundation plots.

**What was done:** A series of DNA isolation techniques, from a commercially standard DNA isolation kit to a simple heating method with costs ranging from several dollars to a few cents per sample, were evaluated. The heating method was well suited with Minibeater to allow for processing 96 leaf samples in a few minutes. When isolated DNA was subjected to PCR amplification, the heating method displayed banding patterns, but the results were inconsistent. The PCR products from microsatellite markers can be visualized following non-denaturing

polyacrylamide gel electrophoresis with ethidium bromide to be added in the running buffer so staining can be done during electrophoresis. Marker visualization using this system costs only a few cents per data point. The overall method has great potential due to its low cost and medium/high speed. However, DNA isolation using a heating method needs further improvement to increase its consistency.

Blast resistant genes have a unique spectrum against blast races and some of them have overlapping spectra. One resistance gene sometimes can phenotypically mask other genes that confer resistance to the same blast race. Markers can identify an individual blast gene and, therefore, are useful for pyramiding blast genes that would be otherwise difficult to accomplish through conventional breeding methods. Various multi-way crosses and backcrosses were made to transfer blast resistant genes from different sources to the leading cultivars and some elite lines. Progenies carrying multiple blast genes were selected. To recover good agronomic characters from the recurrent parents, a large number of BC<sub>1</sub> populations was developed for selection. Blast markers were also used to survey various URN lines that have been rated 0 and 1 for blast resistance under field conditions. Single and multiple blast resistant genes were found among these lines.

Off-types were observed in the foundation plots of several semidwarf rice varieties even though extensive roguing to remove the off-types has been done in the previous year. The off-type is typically taller with lighter green color than the normal cultivar. Multiple unambiguous markers generated from various sources, including RAPD, AFLP, and microsatellite markers, were used in this study. Results indicated that there was a considerable genetic variability among the off-types. The variability was not a result of seed mixture.

**Impact:** The development of a marker detection system that is rapid and inexpensive will facilitate faster integration of marker technology into any existing breeding program. Well characterized markers, such as blast markers, can be used as a model to integrate DNA marker technology into conventional breeding programs. Marker analysis provides basic understanding on how to cope with off-type problems.

**Sources of funding:** State

#### **Federal Goal 1**

**Title: Breeding long-grain rice varieties by conventional methods supplemented by doubled haploid technology**

**Key Themes: Agricultural competitiveness, Agricultural profitability, Biotechnology, Plant germplasm, Plant health, Plant production efficiency.**

**Qi Ren Chu, Associate Professor, Rice Research Station, LAES, LSU AgCenter**



**Issue:** Rice varieties developed by the Rice Research Station have been grown on an average of 62% of the rice acreage, or 1.7 million acres in the southern United States for the last 5 years. In Louisiana, 80 to 90% of the rice acreage has been planted with Louisiana developed varieties. These varieties combine high yield, premium quality, disease resistance, good agronomic characteristics, and enhanced seedling vigor into a single package. It has helped raise Louisiana's rice yield 15% in the last 5 years from 5080 lb/A in 1999 to an estimated 5800 lb/A in 2003. This represents an increase of 3.2 million hundred weights of rice each year worth a conservative 23 million dollars per year to Louisiana rice farmers. This project is complementary to current breeding efforts to develop superior varieties for the southern rice growing area by improving major agronomic traits of current varieties, which include disease resistance, yield components, and grain quality.

**What was done:** In 2003, another culture (AC) breeding focused on developing new long-grain lines. 194 new crosses were made by using bridging parents, which have high yield, resistance to blast and sheath blight, and high regeneration ability. About 12,474 double haploid plants (DH1) were regenerated. Field evaluation and selection of breeding materials increased to about 31,000 progeny rows as compared with 14,000 rows in 2002. These rows consisted of 10,000 DH rows, 10,000 F<sub>3</sub> to F<sub>5</sub> rows, and 11,000 F<sub>3</sub> rows from Steve Linscombe. Among 574 rows harvested, 140 rows showed row weights above 300 grams while the conventional check Cocodrie averaged 288 grams per row. Preliminary Yield trial included 200 entries (100 PY and 100 SP). Ten experimental lines were tested in the Uniform Regional Rice Nursery (URRN) among five states and in Commercial-Advanced trials at nine locations within Louisiana. An additional 10 lines were tested in the Advanced Yield trial at the Rice Research Station. Data summarized from these yield trials indicated that 57 entries had high yield potential and 35 lines (8,000 lb/A) yielded better than the checks Cocodrie, Cypress, and Cheniere.

**Impact:** Long-grain rice varieties occupy the majority of U.S. rice production. The market for long-grain rice is both domestic and international. Global climatic changes signal that the demand for U.S. long-grain rice, particularly in international markets, could increase in the future. Harnessing biotechnology and conventional approaches could expedite the development of high yielding rice varieties.

**Sources of funding:** State and Louisiana Rice Research Board

#### **Federal Goal 1**

**Title:** Clearfield Rice: New Weed Control Technology

**Key Theme:** Agricultural Profitability

**Timothy P. Croughan, Professor (Agronomy), Rice Research Station, LAES, LSU  
AgCenter**

**Issue:** Rice farmers throughout the world face a unique weed problem. A weedy relative of cultivated rice, red rice, can invade and severely infest rice fields, both lowering yields and reducing the selling price of the harvested grain. Most of Louisiana's rice acreage is infested, at least to some extent, with this weed. Because of its close genetic relationship to commercial rice, red rice has proved difficult to control. No herbicide yet developed can adequately control red rice without also injuring or killing conventional rice. Since sufficiently selective herbicides were not forthcoming, an alternative approach to red rice control was explored. Rather than continuing to search for a new herbicide with the desired specificity, this alternative involved trying to change the rice plant instead. The goal was to find a plant that would thrive despite being sprayed with an herbicide known to kill red rice. This approach involved searching for an individual rice plant that had undergone a slight alteration in its natural inventory of genetic information, resulting in the development of resistance to the herbicide. While there is no assurance that such plants could ever be found, the odds were improved somewhat by using techniques that increase the rate of genetic changes above the rates of mutations that naturally occur in all living beings. The resulting herbicide-resistant rice plant would contain a slightly altered but still natural complement of genetic information. It would not be a GMO, since it would contain no inserted gene from another organism.

**What was done:** Natural genetic change was used to develop Clearfield rice, which is resistant to the chemical group of herbicides called imidazolinones. Imidazolinones are a relatively new class of herbicides with significant advantages. The imidazolinone herbicides target a biological mechanism that is specific to plants and not found in humans or other animals. This target, termed the AHAS enzyme, is involved in the production of the amino acids leucine, isoleucine and valine. Plants require the continued production of these amino acids to survive. Imidazolinones work as herbicides because they block the AHAS enzyme, preventing the production of the amino acids. When these are no longer produced, weeds wither and die. Although imidazolinones are toxic to weeds, they do not affect people, insects, or animals, which lack the AHAS enzyme that the herbicide disrupts. Thus, imidazolinones are environmentally friendly herbicides.

**Impact:** While not toxic to animals, imidazolinones are so potent to weeds that it takes only 1 to 2 ounces per acre to control nearly all rice field weeds, and the herbicides are particularly effective on red rice. By comparison, many rice herbicides now used are applied at rates of several pounds per acre, and they do not control red rice. The result of replacing these larger volume herbicides with the imidazolinone herbicides will be a reduction in herbicide release into the environment, and the imidazolinone herbicides are less toxic to begin with. The acreage planted to Clearfield rice in 2003 increased by nearly threefold over the previous year. The number of acres planted with this naturally herbicide-resistant rice is expected to continue to increase for several years.

**Sources of funding:** State

## **Federal Goal 1**

### **Title: Improvement of Rice Production with Plant Growth Regulators**

#### **Key Theme: Tropical Agriculture**

**Richard T. Dunand, Professor, Rice Research Station, LAES, LSU AgCenter**

**Issue:** Poor seedling vigor (slow emergence, low plant population, and short seedling height) in semidwarf varieties, lodging in tall varieties, and outcrossing of herbicide resistant rice are three issues in rice production.

**What was done:** Seed and foliar treatment with gibberellic acid improved seedling vigor in commercial varieties and hybrids and several experimental lines. Trinexapac-ethyl reduced plant height in tall varieties imparting lodging resistance. Imazethapyr limited panicle exertion and prevented seed formation in red rice with no impact on herbicide resistant rice.

**Impact:** Improving seedling vigor reduces seed costs and water use and management and in situations where plant population is increased can increase yield. With erect (not lodged) rice at harvest, there is optimum harvest efficiency (faster harvest and less straw combined), yield, grain moisture, and milling yield. Reducing reproductive development in red rice minimizes the potential for red rice and rice to cross pollinate and will prolong the usefulness of herbicide resistant technologies for controlling red rice in rice. Rice farmers are the direct recipients.

**Sources of funding:** State, Louisiana Rice Research Board, private industry.

## **Federal Goal 1**

### **Title: Advances in Crawfish Harvesting Technology**

#### **Key Theme: Aquaculture**

**Robert P. Romaine, Professor, Aquaculture Research Station, and W. Ray McClain, Professor, Rice Research Station, LAES, LSU AgCenter**

**Issue:** The extensive method of production technology used in the farming of red swamp and white river crawfishes necessitates a method of harvest that is atypical of methods used to harvest fishes. A passive system is used that employs baited traps beginning as early as mid-November in the deep-South and continuing through the following April-June. Regular, frequent harvests are necessary compared with the infrequent batch harvest with seines common with fish culture operations. Harvesting is the highest variable cost (50-70% of total operating costs) for crawfish producers, and bait alone accounts for 30-40% of the total in Louisiana's 121,000-acre crawfish farming industry. A reduction in trapping effort to reduce cost may cause overpopulation, and excessive trapping may reduce harvest efficiency and crawfish size and value by removing the

crawfish before they have had sufficient time to grow to larger sizes. More than any other factor, a reduction in crawfish harvesting expenses from increased trapping efficiency has the highest potential to increase profitability for crawfish farmers.

**What was done:** During the past five years, numerous research studies have been conducted under simulated crawfish mono-cropping production scenarios (Aquaculture Research Station) and rotational cropping strategies (Rice Research Station) to evaluate a myriad of harvesting factors, including evaluation of trap designs, trap density, trapping frequency, trap soak-time, bait types, and bait quantity. Studies have been conducted from late fall through spring to encompass changes in environmental conditions affecting crawfish catch, including water temperature, water quality, crawfish recruitment, and food supply.

**Impact:** Results from these studies have led to new recommendations in harvesting strategies for crawfish farmers, and many of these recommendations have been adopted by industry and are reducing the cost of crawfish production. Trap designs, bait types, and trapping and baiting strategies have been identified that significantly reduce harvest costs without significant changes in established production methods. Significant reductions in trapping days and associated harvesting costs can now be attained with little or no reduction in yield by selecting traps and trapping methods identified in these investigations. Many crawfish farmers once trapped 5 to 6 days/week (100-150 days/season) and used as much as 0.5 to 0.75 lb of bait/trap. Crawfish farmers can obtain a comparable yield, but with significant reduction in costs, by selecting the appropriate bait or bait combination based on water temperature, not exceeding 0.33 lb bait/trap, and reducing trapping effort to 3 or 4 days/week (60-90 days/season). Adoption of these harvesting recommendations developed from these studies have been estimated by personnel in the Louisiana Cooperative Extension Service to have saved crawfish farmers \$2 to 3 million annually in reduced bait and labor costs.

**Sources of funding:** Funding for this research was obtained from USDA Special Aquaculture grants, USDA Southern Regional Aquaculture Center grants, and the Louisiana Crawfish and Promotion Board (a state industry check-off funding source).

## Federal Goal 1

**Title:** Development of Medium-Grain and Special Purpose Rice Varieties for Louisiana

Deleted:

**Key Themes:** Agricultural Competitiveness; Agricultural Profitability

**Xueyan Sha, Assistant Professor, and Steve Linscombe, Professor, Rice Research Station, LAES, LSU AgCenter**

**Issue:** Rice is an important plant commodity with a cash value only behind forestry, sugarcane, and cotton in Louisiana. Medium-grain type is the second most popular type of rice grown in Louisiana after long-grain type. Traditionally, medium-grain rice has made up between 20 and 50% of rice acreage in southwest Louisiana. Even though medium-grain rice acreage has

decreased in recent years, an average of 25,000 acres of medium-grain rice was planted in Louisiana from 1998 to 2002. The demand for special purpose aromatic rice has increased dramatically over the past two decades. Most of aromatic Jasmine and elongating Basmati rice in the U.S. market is imported, and the volume of such imports is increasing every year. Development of new rice varieties has played an important role in improving rice production in Louisiana and southern United States. Considerable genetic potential exists for the further improvement of current varieties, so rice breeding efforts should continue.

**What was done:** 2003 field tests included 116 transplanted F1s, 98 space-planted F2s, and 14,340 progeny rows ranging from F3 to F8. Preliminary yield tests included 75 replicated entries and 150 single plot entries. Ten experimental lines were tested in the Uniform Regional Rice Nursery in five southern rice states and/or Commercial Advanced tests in 9 locations across Louisiana. A total of 351 new crosses were made. Of these, long-grain, Liberty-Link, Clearfield, specialty-purpose, and medium-grain crosses accounted for 88, 6, 8, 125, and 90, respectively. Of 14,340 progeny rows planted this year, 764 rows were bulked for the next year's yield tests. A medium-grain experimental line, LA2183, consistently showed high yield potential and resistance to blast and straighthead over past two years, while a Jasmine-type specialty line, LA2140, continued to show promise both in yield and quality. Increases of both lines have been made for potential varietal release.

**Impact:** In Louisiana, the average yield of medium-grain rice increased from 4,750 lb/A in 1990 to 5,300 lb/A in 2002. Although the advancement of rice production technology played an important role in these yield increases, the majority can be attributed to new varieties developed in this program, such as Bengal. Rice growers in Louisiana and other southern states are facing new challenges, such as low prices, conservation issues, and tight regulation of pesticide use. Improved medium-grain varieties with high yield potential and pest resistance can help rice growers to increase production while reducing the cost and meeting conservation goals. Development of improved special purpose rice varieties adapted to Louisiana environmental conditions will help the Louisiana rice industry obtain a sizable portion of this fast growing, high value rice market, both domestically and internationally.

**Sources of funding:** State, Louisiana Rice Research Board

## **Federal Goal 1**

**Title:** Sperm motility demonstrates mitochondrial DNA mutations

**Key Theme:** Animal Genomics

**Tara M. Taylor, Graduate Assistant, John E. Chandler, Professor, Department of Dairy Science, LAES, LSU AgCenter**

**Issue:** The mitochondria provide energy as ATP for use in such things as transport of sodium through the cell membranes, promotion of protein synthesis by the ribosomes and nucleotide

synthesis. They also supply the energy needed for muscle contraction, DNA construction, and other cellular functions. It is widely held that mitochondrial DNA (mtDNA) is inherited via maternal lines. At the time of fertilization, in most species, the sperm mitochondria enter the egg along with the spermatozoal head. Sperm mitochondria are inactivated and destroyed after fertilization, thus a male cannot pass his mtDNA to his daughters. Theoretically, males with the same mother should have the same mitochondrial population. Therefore, mitochondria in the mammalian body are derived from the dam side of a pedigree and there should be some degree of relationship between the energy utilization of the dam and her progeny. Mitochondrial functionality should differ across families in traits affected by mitochondrial genes. Previous studies indicate that spermatozoal mitochondria can be evaluated for mitochondrial function throughout the body.

Point mutations and structural rearrangements of mtDNA have been connected with neuromuscular and other mitochondrial syndromes. These vary from being lethal at the neonatal stage to causing diseases in old age. Oxidative stress on mitochondria has been linked to causing diseases such as Alzheimer's and Parkinson's disease, myoclonic epilepsy syndrome, and occipital stroke. Mitochondria are also involved with male infertility for many reasons.

Sperm have been shown to be particularly prone to develop deletions of mtDNA that are associated with a decline of motility and fertility. Sperm motility is an indicator of mitochondrial activity. Mutations in one gene in the mtDNA genome could affect mitochondrial energy production, which in return would be expressed as a difference in sperm motility between breeds in animals or lineages in humans. *Bos taurus* and *Bos indicus* cattle represent the two breeds of cattle recognized today. These two are well represented by Holstein and Brahman cattle, which are believed to have diverged into separate groups at least 200,000 to 1 million years ago.

**What was done:** Ejaculates were collected from randomly selected Holstein and Brahman bulls with no familial ties. Bovine mtDNA was totally sequenced in 1984 by Anderson, and that sequence information, although from an unknown breed of cattle, was used as a reference point for this research. Each ejaculate's mitochondrial gene sequence was compared to the reference and then compared to the other breed's mtDNA sequence. Mitochondria differing from the GenBank sequence were considered significant mutations and were analyzed. Breed was found to significantly affect the frequency of mutations. Correlations were calculated between the frequency of amino acid changing mutations and initial sperm motility. Fourteen mutations that change the amino acid sequence were found in the Holstein ejaculates whereas only two of this type mutation were identified in the Brahman breed.

**Impact:** Since breeds of cattle refer back to one maternal ancestor, the mtDNA should be similar in cattle of the same breed. This research supported this theory because none of the bulls collected were from familial ties as far as our records go; yet within breed the number of mtDNA mutations was similar. Therefore, sperm motility does differ between the subspecies *Bos tarus* and *Bos indicus* because of the number of mtDNA mutations. Due to this finding, breed information should be included in the GenBank along with species identification when genetic information or property is stored. This research also suggests that spermatozoa are a readily

obtainable source of mitochondria for future studies of both human and animal mitochondria. Sperm motility can be used to help diagnose mitochondrial diseases in that male, his mother, and his mother's offspring.

**Sources of funding:** State

## **Federal Goal 1**

**Title: Integrated Management Strategies for Insect Pests of Rice in Louisiana**

**Key Theme: Integrated Pest Management**

**Michael Stout, Associate Professor, Department of Entomology, LAES, LSU AgCenter**

**Issue:** The rice water weevil, *Lissorhoptus oryzophilus*, the rice stink bug, *Oebalus pugnax*, and stem borers (various species) are the most important insect pests of rice in Louisiana. Yield losses attributable to these pests regularly exceed 20% in experimental plots in southwest Louisiana. The current management programs for these pests rely almost exclusively on applications of insecticides. One goal of this project is to increase the effectiveness of insecticide applications against insect pests of rice by refining current economic thresholds and developing improved methods of monitoring pests. However, reduced reliance on insecticides and increased reliance on alternative strategies are needed to reduce the environmental impacts and increase the affordability and sustainability of the management programs for these pests. Thus, another goal of this project is the diversification of the management programs for water weevils, stink bugs, and stem borers via the integration of cultural practices and host plant resistance into the programs.

**What was done:** The foundation of the management program for the rice water weevil continues to be the use of insecticides. Four insecticides are currently registered for use against the rice water weevil: Icon, Karate, Dimilin, and Mustang Max. This is the first full growing season in which the use of Mustang Max (an improved formulation of Fury) has been allowed; the use of Icon in U.S. rice will be discontinued after the 2004 growing season. All four products have been shown to give effective control of the rice water weevil in small-plot tests and field-scale demonstrations, although there have been some reports of product failure and non-target effects, particularly with Icon. The effects of different rates and timings of the foliar insecticides (Karate, Dimilin, and Mustang Max) were tested, and several new products and new formulations of old products were also tested. Two seed treatments showed promise against weevil larvae, and an additional pyrethroid compound was shown to be as effective as Mustang Max and Karate. A test of Mustang Max and Karate showed that two foliar applications are needed when weevil populations are high.

There continues to be a need for the development of treatment thresholds that will allow rice producers to determine the best time to apply foliar insecticides to their fields. To address this need, research is being conducted to determine the relationship between densities of weevil

adults and weevil larvae (the damaging stage of this insect). In addition, new methods for monitoring populations of adult weevils in rice fields are being investigated, and basic biological studies of the processes by which weevils find their host plants are being conducted.

The use of appropriate cultural practices can help manage the rice water weevil. One cultural practice that may be useful is early planting. If fields are planted early, it may be possible to avoid large, damaging infestations of weevils. Experiments are being conducted to test this possibility. Early-planted plots of rice sustained lower yield losses than rice planted in April or May. Temperature-based models have been developed to better predict both the timing of invasion of rice fields by weevils in early spring and the development of immature weevils in fields after flooding. These models will help in the development of recommended early planting dates.

Research conducted over the past three years has shown that short delays in flooding of rice fields can reduce yield losses from this pest. This strategy works because delays in flooding delay infestations by weevil larvae until rice is older; older rice is more resistant to feeding by rice water weevils.

The severity of yield losses from the rice water weevil may be affected by both seeding rates and tillage practices. Experiments to investigate the impacts of both of these cultural practices were conducted. Plots of rice planted at very low seeding rates suffered proportionately greater yield losses than plots planted at normal and high seeding rates.

Host plant resistance also holds promise as a management strategy for rice water weevils in Louisiana rice. The resistance and tolerance of commercial varieties have been evaluated over the past several years. Although none of the commercial varieties commonly grown in Louisiana possess high levels of resistance, the moderate levels of resistance present in some commercial varieties may be useful in a management program. Several rice lines with greater resistance to the rice water weevil than commercial varieties have been found, and a program to breed rice varieties with higher resistance to the rice water weevil has been initiated.

A number of insecticides are registered for use against the rice stink bug. The insecticidal activities of two of the recently-registered insecticides, Karate and Mustang Max, may be more persistent than that of older insecticides, notably methyl parathion. Small- and large-plot studies are being performed to compare the effectiveness and persistence of Karate, Mustang Max, and methyl parathion. In addition, a fungus, *Beauveria bassiana*, is being evaluated as a biological insecticide against the rice stink bug. The relationship between densities of stink bugs and yields of rice are being characterized in an effort to refine thresholds for applications of insecticides against this insect. Early-planted plots of rice had lower densities of stink bugs at 75% heading than plots of rice planted in April or May.

Stem borers were a major problem in a few fields in north and central Louisiana last season. A new species of stem borer, the Mexican rice borer, is currently present in eastern Texas and may invade Louisiana in the next few years. The entomology program has expanded to include investigations of stem borers in rice. Several of the insecticides currently registered against



water weevils and stink bugs were also effective against stem borers. Transgenic rice expressing a BT toxin effectively controlled stem borers in a small-plot experiment.

Several species of mosquitoes that breed in rice fields can transmit important human diseases, such as West Nile virus. Measures taken to control rice water weevils, stink bugs, and stem borers in rice fields may affect the mosquitoes that breed in rice fields. Possible interactions between insect management and mosquito control in rice fields are being investigated. Preliminary results suggest that management strategies used against stink bugs in Louisiana rice fields will have a greater impact on mosquitoes than management strategies used against rice water weevils, because densities of mosquito larvae in rice fields are higher when stink bugs are present than when rice water weevils are present.

**Impact:** Refinement of thresholds for both rice water weevils and rice stink bugs will increase the cost-effectiveness with which these products are used and potentially eliminate unnecessary insecticide applications. The loss of Icon after 2004 will impact rice farmers negatively unless a replacement seed treatment can be found. A granular post-flood insecticide will be tested in 2004; such a product can be used as needed rather than prophylactically. This will allow those farmers who do not regularly suffer high losses from weevils to apply insecticides only when needed. Adoption of the use of early planting and delayed flooding against the rice water weevil will further increase the cost-effectiveness of weevil management programs and will eliminate some insecticide applications. Research on host-plant resistance may result in the development of weevil-resistant rice varieties, which will further reduce dependence on costly insecticides.

**Sources of funding:** Federal funds (USDA-NRICGP, Biologically-Based Pest Management Program, USDA Southern Region IPM Program), Louisiana Rice Research Board, additional funds from agri-chemical companies.

## **Federal Goal 1**

**Title: Biological Control of Arthropod Pests and Weeds**

**Key Theme: Biological control**

**Seth Johnson, Professor, Department of Entomology, LAES, LSU AgCenter**

**Issue:** Control of invasive pests: red imported fire ants, common and giant salvinia, and southern and tawny mole crickets through the importation and release of exotic natural enemies.

**What was done:** Established a colony of the phorid fly, *Pseudacteon tricuspis* after construction of a self contained and environmentally controlled phorid fly attack box (1.2m X 2.44m X 0.61m) which facilitates parasitization of red imported fire ant workers. Flies were obtained from the USDA-APHIS colony in Gainesville, FL. Evaluation of the six Louisiana *P. tricuspis* release sites in September 2003 found well established and expanding *P. tricuspis* populations at Covington and Norwood but fly populations appear to have vanished from Montpelier and Delhi

after surviving at least one winter at each site. Flies were not recovered after the first winter at Natchitoches and were never recovered from the Lake Arthur site. The dispersal pattern for *P. tricuspidis* at Covington and Norwood resembled an ellipse with greater dispersal to the north and east at both locations. The flies now occupy an area of 429 k<sup>2</sup> and 36.6 k<sup>2</sup> surrounding the Covington and Norwood release sites, respectively. Field data continues to be collected to measure the impact of *P. tricuspidis* on red imported fire ant workers.

A colony of the Florida population of the salvinia weevil, *Cyrtobagous salviniae*, was established on common salvinia, *Salvinia minima* in tanks in the greenhouse which has photoperiod and temperature controls allowing for year-round production of weevils and salvinia. The colony was established with 300 weevils sent in two shipments from south Florida. From 100-200 weevils of the Florida and Brazilian populations of the salvinia weevil were released in one m<sup>2</sup> PVC enclosures on common salvinia at Henderson, St. James Parish, Joyce Wildlife Management Area and Maurepas Wildlife Management Area in July and August. Control plots were also established at each location. Plots were at least 500m apart. Water quality will be monitored monthly during the summer. Wasps of the parasitic spechid, *Larra bicolor* originally from Bolivia, were released at Burden Experiment Station in a 0.3 ha patch of partridge peas for mole cricket biological control. A total of 26 females and 10 males were collected individually in vials at the flowers of *Spermacoce verticillata* in Gainesville, FL on the morning of 10 Oct. 02 and released that same night at Burden Experiment Station in Baton Rouge. Adults of *L. bicolor* were not observed at blooming partridge peas at the release site in fall 2003.

**Impact:** Classical biological control efforts against red imported fire ants, common and giant salvinia and southern and tawny mole crickets, if successful, will result in lower populations of these pests and reduced usage of pesticides for their control.

**Sources of funding:** State and Regional funds

#### **Federal Goal 1**

**Title: Red Imported Fire Ant Impact on other Ants, and Ground-Dwelling Invertebrates and Mammals**

**Key Theme: Invasive Species**

**Linda M. Hooper-Bùi, Assistant Professor, Department of Entomology, LAES, LSU AgCenter**

**Issue:** The impact of the invasive species, red imported fire ant, on native ecosystems and urban and suburban areas is considerable. Fire ants are implicated in the reduction of species diversity of other ants and ground-dwelling invertebrates, mammals, and birds. Recent issues in biosecurity bring to light the importance of species diversity and the impact of invasive species on the native fauna and the quality of life of affected citizens. These impacts of the red imported

fire ants on native ecosystems have largely gone unmeasured in Louisiana. We have analyzed several aspects of the effect of fire ants on important features of Louisiana ecosystems and the citizens. We are quantifying, curating, and identifying the species diversity of ants in Louisiana. We are also examining the impact of fire ants on ground-nesting mammals and invertebrates in two prominent ecosystems in Louisiana. The ecological factors that are important for fire ant populations were examined.

**What was done:** Four projects are described here. The first investigated the diversity of ants of Louisiana through systematically documenting all the species of ants that live in Louisiana. In 1960, a report listed 128 species of ants that might occur in Louisiana but only 40 of them were collected in the state. We have collected and identified 52 species and have ~20 morphospecies that are not yet identified. However, these do not include complex groups such as *Pheidole*, *Camponotus*, *Solenopsis (Diplorhopturum)*, *Formica*, and small *Pyramica* and other cryptic ant species.

The second is a project in which we examined the impact of fire ants on ground-dwelling mammals and invertebrates in two ecosystems at Alexander State Forest (pine mixed hardwood) and Sandy Hollow Wildlife Management Area (longleaf pine). Six 5-acre plots were established in each ecosystem and half of the plots were treated with Amdro to suppress fire ants. We trapped mammals biannually and invertebrates semimonthly. The Amdro suppressed the fire ants on treated plots and we saw significant increases in spiders, mites & ticks, and leafhoppers in treated plots at Alexander State Forest. Also, Hispid Cotton Rat, Cotton Mouse, and White-footed Mouse were more numerous after treatment. At Sandy Hollow, spiders and grasshoppers increased when fire ants were suppressed, and Cotton Mouse numbers increased on plots that were treated.

Two projects addressed different ecological factors that affect fire ant mounds density and presence in urban and natural ecosystems. One of the projects addressed ecological questions that will help determine whether mound counts or food traps are the best methods for determining fire ant population density, especially for areas with low population numbers such as areas where chemical and biological control have been implemented. We determined that in areas where researchers find low numbers of mounds, food traps are a more accurate estimation of the impact of fire ants on an ecosystem and where mound counts are higher, both mound counts and food traps are equally accurate. The second project identified factors such as soil type, canopy cover, and vegetation type as significant factors for fire ant presence. Ants were more commonly found in silt or loam/silt loam type soils and in areas where there were trees that provide some shade.

**Impact:** Our projects are important to stakeholders, citizens, and scientists who are interested in biodiversity and preservation of natural resources. Our knowledge of impact of fire ants on ant and invertebrate diversity is important to ecosystem managers. Particularly important is our landscape-level approach to fire ant impact on mammal populations. Land managers and foresters will use this information to make important habitat and forest management decisions. The information on interaction between fire ants and other species of ants will help scientists

determine the whole impact of new biological control efforts, and they can have pre-emptive information to reduce secondary pest outbreaks as a result of control measures. Pest management professionals, scientists, and citizens who are involved in chemical or biological control of fire ants and other invasive ants will find our work interesting. Our work has helped pest management professionals identify and manage unknown invasive ants. The knowledge of ecological factors affecting ant presence can be used by citizens and land managers to make landscape decisions to minimize fire ant presence in areas that have heavy human traffic.

**Sources of funding:** State of Louisiana, Board of Regents, FMC, BASF, Bayer Environmental

Deleted: Appendix 1¶

## Federal Goal 1

**Title: Evaluation of Brucella abortus RB51 as a Multivalent Vaccine to Generate Immune Responses against Brucellosis, Tuberculosis, and Johne's Disease in Cattle**

**Key Theme: Animal Health/Bioterrorism**

Formatted: Bullets and Numbering

**Philip H. Elzer, Department of Veterinary Science, LAES, LSU AgCenter**

**Issue:** Vaccinating animals, specifically cattle, against brucellosis, tuberculosis, and Johne's Disease, with a multivalent vaccine that is safe and efficacious, which will additionally assist in the protection of the animals from a potential agroterrorist attack using these pathogens.

Deleted: Guidance on Preparation of Research Project Reports¶

¶ The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:¶

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

**What was done:** Animals that had previously been vaccinated with B. abortus RB51 expressing protective antigens from different Mycobacterium species were challenged with either virulent B. abortus or M. bovis. All animals remained negative on all routine diagnostic tests. Vaccinates and the appropriate controls received B. abortus 2308 and were necropsied after an appropriate interval to determine tissue colonization by the challenge strain. In collaboration with Texas A&M, vaccinated and controls animals were challenged with M. bovis, and tissues collected at necropsy for bacteriologic and histological examination. Currently, final bacteriological and pathological analyses are being conducted.

**Impact:** A disease-free food animal population is imperative to the well-being of all individuals. All three of the regulatory diseases addressed in this study deleteriously impact the economics of cattle producers, directly affecting the market price and interstate and international import/export potential of the animals, which in turn influences all consumers. As zoonotic organisms, Brucella and Mycobacterial species pose a human health threat hence, a protected animal population benefits the general public. Brucellosis animal vaccine work has a significant impact in protecting the human population since Brucella species are also known as bioterrorist agents or "agents of mass destruction."

Formatted: Bullets and Numbering

**Sources of funding:** Animal Health funds, State, Hatch, and USDA cooperative agreements.

Deleted: ¶  
Note: Examples of research project reports under the different federal goals may be reviewed in the LSU Ag Center Annual Report for FY 2002 at ¶  
¶ [http://www.lsuagcenter.net/irod/federal\\_report.htm](http://www.lsuagcenter.net/irod/federal_report.htm). ¶

## **Federal Goal 1**

**Title: Identification of host defense factors against the protozoan parasite Perkinsus marinus in eastern oysters (*Crassostrea virginica*)**

**Key Theme: Animal Health/Aquaculture**

**Jerome F. La Peyre, Assistant Professor, LSU Veterinary Science, LAES, LSU AgCenter**

**Issue:** Dermo disease caused by the protozoan parasite *P. marinus* causes extensive mortalities of eastern oysters and has prevented the development of intensive aquaculture of this species along the Atlantic and Gulf of Mexico coasts. Elimination of *P. marinus* from oysters and ultimately the development of disease resistant oysters would therefore offer direct economic gain to the oyster industry as well as help restore ecologically beneficial oyster reefs.

**What was done:** A comprehensive approach is being taken to identify oyster anti-*P. marinus* defenses. Several proteins with anti-protozoal and antibacterial activities have already been purified and are being characterized. The identification of these proteins will be useful in developing resistance to Dermo disease in eastern oysters. Moreover, some of these proteins appears to have unique properties and their potentials for commercial use in the food and pharmaceutical industries are being investigated.

**Impact:** The identified defense proteins can be used as selection markers for breeding disease resistance to *P. marinus* in eastern oysters. Alternatively, these oyster host defenses can provide endogenous genes for developing disease resistant oysters by increasing their expression through genetic manipulation.

**Source of funding:** USDA Hatch, Sea Grant, NMFS

## **Federal Goal 1**

**Title: Sugar Processing Microbiology**

**Key Theme: Agricultural Profitability**

**Donal Day, Professor, Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** Development of solutions to problems in sugar manufacture that are of microbial origin. The proposed research concentrates on defining problems of microbial origin that effect the production of raw cane sugar and developing practical solutions to those problems.

**What was done:** Research focused on practical microbial control at the sugar mill, through direct inspection and control advice to the operating staff at each mill in Louisiana. Laboratory

developments were on new cheaper methods for dextran monitoring and biosafety through use of a new biocide developed in prior years.

Phage-display antibody technology was used to select a dextran binding phage that can be used as an analytical agent for dextran detection in a dipstick assay. It holds the potential of becoming a low cost assay system suitable for mass monitoring of agricultural products (i.e.sugarcane). The rights to the biocide mentioned previously have been acquired by a commercial entity. Research has continued on potential applications of this compound and a patent has been filed. This compound has proven to be an excellent wide spectrum biocide for surface disinfection of all types of contaminated surfaces, including those coated with biofilms.

**Impact:** Sugar is a major component of Louisiana's agricultural sector. The direct value of this crop, not including value added calculations, is in excess of \$640,000,000. Microbial losses during sugar production are small but not trivial, and range from sugar loss due to undesirable polysaccharides to equipment loss due to corrosion from microbially generated acids. Control of these losses can significantly improve the operating costs of sugar mills.

Dextran is a continuing economic problem in sugar production. The primary source is from stale cane. The ability to rapidly detect stale cane as it reaches the sugar mill, prior to processing, would be of great value. The volume of analyses required needs a lower cost alternative analytical method than is currently available.

**Sources of funding:** State

#### **Federal Goal 1**

**Title: Cane Sampling, Yard Losses, and Energy Utilization in Raw Sugar Factories**

**Key Themes: Agricultural Competitiveness; Agricultural Profitability; Efficiency**

**Peter Rein, Professor; Donal Day, Professor; Michael Saska, Professor; Harold Birkett, Professor; Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** To improve the accuracy of the core sampling method for cane quality analysis, to determine the loss of sugar in the cane yard from receipt of cane to processing, and to determine the most cost effective manner of improving the energy efficiency so that increased quantities of imbibition water can be accommodated.

**What was done:** The cane sampling and yard losses portions of the study have been completed previously. Current work is directed at determining heat transfer coefficients at the evaporator station throughout the cleaning cycle.

In 2003, data were gathered on the operating conditions of multiple effect evaporators at several sugar factories throughout the operating cycle. A computer program has been written to solve the material and energy balances and calculate the heat transfer coefficients.

**Impact:** Most of the Louisiana sugar factories require more steam than can be provided from the available fuel and hence burn natural gas as an auxiliary fuel. Better data on evaporator performance and factors affecting the heat transfer coefficient will allow for more cost effective evaporator designs and energy savings. Natural gas usage currently costs the Louisiana sugar industry about \$6,000,000 per year. Most of this gas usage can be eliminated by appropriate evaporator designs.

**Sources of funding:** State and American Sugar Cane League.

### **Federal Goal 1**

**Title: Minimization and Removal of Evaporator Scale in Raw Sugar Factories**

**Key Theme: Agricultural Profitability**

**Peter Rein, Professor; Donal Day, Professor; Michael Saska, Professor; Harold Birkett, Professor; Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** Reducing the cost of cleaning evaporators and the downtime which reduces sugar mill capacity.

**What was done:** A set of evaporators at St James mill was fitted with the instrumentation necessary to calculate heat transfer coefficients in individual evaporator vessels on line with the aid of a computer model running in real time.

A pilot plant falling film plate evaporator was set up to run in parallel with first and final effect evaporators at Cinclare mill to monitor the rate of evaporator scaling, measure the quality of scale deposited under the two different regimes, and devise suitable chemical cleaning options.

**Impact:** Valuable information was generated at St James mill to assess the performance of individual evaporator vessels. This enabled the operators to see the rate of evaporator scaling, to decide when it would be necessary to clean the evaporators and to assess after cleaning the efficiency of the cleaning of individual vessels. The continuation of this work involves modeling the scaling characteristics of each vessel to enable predictions to be made of when cleaning will be necessary.

Data have been generated at Cinclare that will provide a useful comparison of the heat transfer performance of different types of evaporator. The efficiency of cleaning is still being assessed.

**Sources of funding:** State

## **Federal Goal 1**

### **Title: Improvements to Sugar Mill Recoveries and Efficiencies**

#### **Key Theme: Agricultural Profitability**

**Peter Rein, Professor; Donal Day, Professor; Michael Saska, Professor; Harold Birkett, Professor; Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** Improving the efficiency of sugar mills involves reducing the losses of sugar which occur in processing.

**What was done:** The accurate survey of molasses produced in all Louisiana mills was continued. This provides good information to the processors on the degree to which molasses has been exhausted, and shows what room for improvement exists.

Collaboration with Raceland mill was continued in an effort to measure accurately the inputs and outputs of the process to correctly quantify losses of sugar in bagasse, in molasses, in filter cake and undetermined losses. Accurate analyses by HPLC of juice, syrup, various intermediate massecuite streams, and final molasses was done.

Extension of HPLC analyses to weekly composite juice samples at some of the mills was initiated to help quantify losses.

**Impact:** The losses of sugar in nearly all the Louisiana mills has reduced over the last 3 years as the molasses survey has come to be accepted and the understanding of how they represent true losses of sugar in molasses has been accepted. A reduction in average purity in 2003 of 1.5 units of purity translates into an increase in sugar production of 0.5%. Based on an average crop, this represents an increase of 7,500 tons of sugar per year, with a value of \$4.5 million.

Substantial progress in understanding how and where losses of sugar in the process occur has been made at Raceland. It is expected that this will lead to further substantial savings in other loss areas.

**Sources of funding:** Hatch

## **Federal Goal 1**

### **Title: Optimization of Sugar Crystallization Processes**

#### **Key Theme: Agricultural Profitability**

**Peter Rein, Professor; Donal Day, Professor; Michael Saska, Professor; Harold Birkett, Professor; Audubon Sugar Institute, LAES, LSU AgCenter**



**Issue:** Crystallization is a major unit operation in sugar processing and improvements here translate to significant benefits for processors.

**What was done:** The performance of various sensors for controlling crystallization was evaluated.

A new automation system was designed, implemented, and commissioned on a lab pilot plant pan to enable further controlled experiments to be undertaken.

Heat transfer measurements on different samples of molasses were undertaken to establish the factors affecting heat transfer and try to establish what factors lead to hard-to-boil characteristics. Crystallization rates were measured for different grades and purities to assess the effect on crystallization rates. The inclusion of color into the crystal was studied.

**Impact:** Experience gained on the pilot plant system was used to design a system for St. James mill, which was implemented and run in the 2003 season with success.

Some progress was made in identifying what action to take in the event of “pan death syndrome”, where the pan stops boiling due to particular molasses characteristics. This phenomenon did not recur in the 2003 season.

Significant progress was made in the pilot plant on crystallization rate measurements. The data are still being evaluated and are expected to add to our understanding of this complex process.

**Sources of funding:** Hatch

#### **Federal Goal 1**

**Title: Removal of Color in Sugar Processing and Effluent Treatment**

**Key Theme: Agricultural Profitability**

**Peter Rein, Professor; Donal Day, Professor; Michael Saska, Professor; Harold Birkett, Professor; Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** The direct production of white sugar at the Louisiana mills can lead to significant added value, in producing a product that attracts a higher price than raw sugar.

**What was done:** Work on the effect of membrane treatment and ion exchange treatment on Louisiana juices was undertaken. Two different strategies for producing white sugar directly have been identified and are under investigation. The WSM process is being looked at with funding from Calgon Carbon and an alternative cheaper process is being investigated which gives better color removal. The patenting of this process is under investigation.

**Impact:** A direct production of white sugar process could increase the Louisiana sugar mills' revenue by over \$90 million per year.

**Sources of funding:** Hatch

## Goal 2

LSU AgCenter Goal 2 is to provide a safe and secure food and fiber system which specifically will improve food safety and eliminate food-borne risks.

### Research Reports

Bacteriophages, viruses that lyse bacteria specific to *Vibrio parahaemolyticus* and *Vibrio vulnificur*, have been found in seafood and oysters. These bacteriophages have the potential to control foodborne pathogens in seafood or could be used for detection of *Vibrio* contamination of oysters. In addition, bacteriophages active against virulent *Vibrio* sp. could possibly be a processing aid to control the pathogens in live oysters.

Results have shown that acidified sodium chlorite is effective in inhibiting the growth of *Listeria monocytogenes* when the pathogen was grown on the surface of ready-to-eat meat products. These findings have potential to benefit Louisiana based industries involved in processing ready-to-eat beef and poultry products.

A possible solution for controlling foodborne pathogens such as Salmonella and *Campylobacter* sp. is edible films containing antimicrobial agents. EDTA (ethylenediaminetetraacetic) with or without zein edible film containing nisin coated onto the surface of raw chicken reduced the counts of *Campylobacter jejuni* significantly.

Chitosan, from crawfish, is an inherent anti-microbial agent and was investigated as an edible film or coating on fresh-cut apples to protect the product from *Listeria* and *Escherichia coli* (EHEC). Results were promising and chitosan coating with added microbicier is anticipated to extend shelf life of fresh cut produce

### Extension Reports

A total of 32 participants from the seafood processing plants received training in HACCP (Hazardous Analysis of Critical Control Points) and SCP (Sanitation Control Procedures). As a result, seafood processors better understand the requirements of HACCP regulations and food safety in general. Fifteen Walmart distribution center employees from Louisiana and other states were also HACCP certified. Participants learned how to prepare HACCP plans and record keeping systems. Round table meetings with red meat and poultry processors, USDA FSIS regulatory officials, and academia helped participants better understand and better meet the requirements of HACCP regulations.

Total Extension FTEs on Goal 2 programs were 7.28 for a total expenditure of \$583,390.

A total of 156,159 educational contacts were made in Goal 2 programs.

Deleted: Appendix 2¶

¶  
FY 2003 LSU Ag Center Annual Report for USDA-CSREES¶  
Guidance on Preparation of Extension Program Reports¶

¶  
The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:¶

¶  
*Goal 1.* An organized agricultural system that is highly competitive in the global economy.¶

*Goal 2.* A safe and secure food and fiber system.¶

*Goal 3.* A healthy, well-nourished population.¶

*Goal 4.* Greater harmony between agriculture and the environment.¶

*Goal 5.* Enhanced economic opportunity and quality of life for Americans.¶

¶  
Extension programs included in the report under each of the five goals are to be prepared in a specific format. The format is indicated below along with explanation of the procedure to be followed and the supporting/explanatory material to be used in developing reports of extension programs.¶

¶  
*1. Title of Extension Program:* Specify the title of the reported program (Example: Dairy, Beef, Master Farmer, Economic Development, Water Management, etc.). Last year's annual report to USDA-CSREES included 41 extension programs as shown in Appendix 1.¶

*2. Federal Goal:* Indicate goal number (1, 2, 3, 4, 5, or "Other" if program does not match any of the five goals).¶

*3. Key Theme:* Select an appropriate theme related to the extension program from the list of themes specified for each goal (List at Appendix 3)¶

*4. Description of the Program:* Describe what was done in (or progress of) the program during the reporting year (FY 03) on the following items:¶

¶  
*Stakeholder Input in Program.* Describe what was done to seek and use input from the program's stakeholders (individuals, groups, and organizations with a vested interest in the program and/or who are affected in some way by the program). Include the following information:¶

¶

... [1]

**GOAL 2**  
**EXTENSION SUMMARIES**

## **Federal Goal 2**

### **HACCP – FOOD SAFETY**

#### **Key Theme: HACCP**

**David Bankston, Professor; John Bell, Assistant Professor; James Farr, Associate Professor; Alfred Trappey, Assistant Professor; Department of Food Science, LSU AgCenter**

#### **Program Description**

HACCP training has been focused on seafood, utilizing the AFDO (American Food & Drug Officials) standardized training programs for SCP (Sanitation Control Procedures) and HACCP to meet FDA requirements for the seafood industry.

All seafood processors are required by the FDA to attend HACCP training. The AFDO HACCP course includes certification of training for the participants. The SCP course is not required by the FDA, but forms the foundation of food safety control and helps increase the understanding of HACCP. Training was conducted in Baton Rouge, which provides a central location to the industry. In 2003, one Basic Seafood HACCP and one SCP training programs were completed. In the HACCP workshop, there were a total of 22 attendees. For the SCP course, there were a total of 10 attendees. The Basic Seafood HACCP training course duration is three days, while the SCP training is one day. As part of these trainings, all stakeholders provide evaluations of the course. The major problem is the length required of the HACCP training. This year, the training courses were held in the LSU AgCenter's Food Processing and Technology Pilot Plant, which allowed the instructors to conduct value-added processing demonstrations and practical sanitation controls activities. Several groups cooperated in providing the training. The LA Department of Health and Hospitals and the US Food and Drug Administration provided speakers at all training sessions.

In addition, a one-day segment of the AFDO HACCP workshop trained and certified 15 Walmart distribution center employees from Louisiana and other states. LSU's seafood HACCP training program was selected and funded by Wal-Mart Quality Assurance management.

For the red meat and poultry processors in Louisiana and nearby states, a program of quarterly Round Table discussion meetings to focus on practical applications to comply with USDA HACCP requirements was developed. This program was initiated this year by LSU Ag Center Department of Food Science extension faculty to facilitate improved industry-regulatory relationships and improved HACCP compliance. Each of these meetings involved 15 – 30 participants from industry, USDA FSIS regulatory officials, and academia.

HACCP-based plant visits and HACCP plan consulting activities were conducted for over 10 seafood processors and 5 red meat and poultry processors. Additional HACCP consultations were provided for these groups of processors.

### **Program Impact**

As a result of the HACCP and SCP training, seafood processors better understand the requirements of the HACCP regulations and food safety in general. They learned to prepare HACCP plans and record keeping systems for HACCP and sanitation. Including representatives from state and federal regulatory agencies helps to ensure that these processors are now prepared to comply with complex state and federal regulations. As a result of the Round Table meetings, red meat and poultry processors better understand the requirements of the HACCP regulations and potential approaches to meet these requirements. Food processors are in an improved position to ensure safely processed seafood products and understand the food safety principles involved.

### **Source of Funds**

Smith Lever, 3 b, c (federal funds)

### **Scope of Impact**

State and regional HACCP, SCP training courses and plant visits.

**GOAL 2**  
**RESEARCH SUMMARIES**

## Federal Goal 2

### **Title: The Seasonal Occurrence of Bacteriophages Active Against *Vibrio Parahaemolyticus* and *Vibrio Vulnificus* in Live Oysters**

#### **Key Theme: Food Safety**

**Marlene E. Janes, Department of Food Science, LAES, LSU AgCenter**

**Issue:** *Vibrio parahaemolyticus* and *Vibrio vulnificus* are bacteria widely distributed in the estuarine and marine environments. Every summer, the oyster industry is threatened by recall of oysters due to *vibrio* contamination. Bacteriophages, viruses that lyse bacteria specific to *Vibrio parahaemolyticus* and *Vibrio vulnificus* have been found in seawater and oysters. The objective of this study is to determine the seasonal occurrence of bacteriophages isolated from oysters and seawater that cause lyses of *Vibrio parahaemolyticus*, virulent and attenuated *Vibrio vulnificus*.

**What was done:** Our results indicated that the bacteriophages found in the oyster tissue were more abundant against the virulent strain of *Vibrio vulnificus* compared to the attenuated *Vibrio vulnificus* strain and *Vibrio parahaemolyticus*. The highest counts for bacteriophages active against virulent *Vibrio vulnificus* were from April 2003 to October 2003 with August having the highest counts of 3.93 PFU/g of bacteriophages. The bacteriophages active against attenuated *Vibrio vulnificus* had higher counts (about 3.00 PFU/g) between April 2003 and August 2003 but the counts were at non-detectable levels by October 2003. The bacteriophages active against *Vibrio parahaemolyticus* were always below 2.50 PFU/g and were at non-detectable levels in December 2002 and August 2003. These results indicate that bacteriophages active against both *Vibrio vulnificus* strains have a seasonal distribution occurring mainly in the summer months when both of these bacteria are at their highest numbers in oysters.

**Impact:** Bacteriophages have the potential to control foodborne pathogens in seafood or could be used for the indication of *Vibrio vulnificus* and *Vibrio parahaemolyticus* contamination of oysters. Our results indicate that bacteriophages active against the virulent *Vibrio vulnificus* and *Vibrio parahaemolyticus* are naturally found in oysters and could possibly be used as a processing aid to control this pathogen in live oysters.

**Source of funding:** Hatch, Multi-state



## Federal Goal 2

### **Title: The Reduction of *Listeria Monocytogenes* on Roast Beef with Acidified Sodium Chlorite**

**Key Theme: Food Safety**

**Marlene E. Janes, Department of Food Science, LAES, LSU AgCenter**

**Issue:** On October 2, 2003 the USDA, Food Safety and Inspection Service, issued a new directive for the control of *Listeria monocytogenes* on ready-to-eat products. In order to help local processors meet this new requirement, we have been investigating acidified sodium chlorite as a possible method for the control of *Listeria monocytogenes* on RTE meat products.

**What was done:** Our study evaluated various concentrations of acidified sodium chlorite needed to effectively reduce *Listeria monocytogenes* counts on 5-gram cubes of ready-to-eat roast beef samples at refrigerator temperatures. Immediately following the initial inoculation (6.4 Log CFU/g) all the cooked roast beef samples treated with acidified sodium chlorite showed significantly decreased bacterial counts compared to control non-treated samples due to the rapid antimicrobial action of acidified sodium chlorite against *L. monocytogenes*. By day 28 the 500, 750, or 1000 ppm acidified sodium chlorite treated roast beef samples had greater than 4.00 Log CFU/g reductions whereas the same concentrations of acidified sodium chlorite treated regular roast beef samples only had about 2.5 Log CFU/g reductions in *L. monocytogenes* counts compared to the controls.

**Impact:** With the recurring recalls of ready-to-eat meat and poultry products due to contamination by *Listeria monocytogenes* there is a clear need to develop additional methods to prevent economic loss and possible deaths that can occur from foodborne listeriosis infections. Our results have shown that acidified sodium chlorite is effective in inhibiting the growth of *L. monocytogenes* when this pathogen was grown on the surface of ready-to-eat meat products and will benefit Louisiana based ready-to-eat meat processing companies.

**Source of funding:** Hatch

## Federal Goal 2

### **Title: Growth and survival of foodborne pathogens in biofilms collected from cattle water troughs**

**Key Theme: Food Safety**

**Marlene E. Janes, Department of Food Science, LAES, LSU AgCenter**

**Issue:** On September 9, 2003, the Food Safety and Inspection Service (FSIS), USDA, held a meeting concerning pre-harvest food safety issues. This meeting focused on the gaps in research needed for the reduction of *E. coli* O157:H7 and other pathogens in livestock prior to slaughter. One of the focuses of FSIS is the development of Best Management Practices to control foodborne pathogens in livestock before slaughter. Our study investigated the growth of *L. monocytogenes*, *E. coli* O157:H7 and *S. typhimurim* in biofilms collected from cattle water troughs on various surfaces to better understand the ability of these pathogens to survive and to develop methods to control them in the environment of small cattle farms.

**What was done:** The biofilms were inoculated with about 3.5 Log CFU/g of *L. monocytogenes*, *E. coli* O157:H7 or *S. typhimurim*. Our results showed that by day 8 the counts for *L. monocytogenes* increased to about 7 Log CFU/g, *E. coli* O157:H7 increased to above 9 Log CFU/g and *S. typhimurim* increased to 9 Log CFU/g in biofilms placed onto the surface of wood, glass, rubber, or tin. However, when grown in biofilms on the surface of copper *L. monocytogenes* and *E. coli* O157:H7 counts were at non-detectable levels from 8 to 20 days whereas *S. typhimurim* counts were only reduced 1.5 Log CFU/g from control levels. These results indicate that copper ions are released slowly over time and have antimicrobial effects against *L. monocytogenes* and *E. coli* O157:H7 grown in biofilms.

**Impact:** Reservoirs responsible for the colonization of cattle with *E. coli* O157:H7 are still poorly understood. Our research indicated that *E. coli* O157:H7 is capable of growing and surviving in biofilms found in cattle water troughs and this research could lead to control measures to help reduce or eliminate this pathogen in cattle water troughs.

**Source of Funding:** Hatch project.

## Federal Goal 2

**Title:** Control of *Campylobacter jejuni* on the surface of raw chicken coated with edible zein films containing ethylenediaminetetraacetate and / or nisin.

**Key Theme:** Food Safety

**Marlene E. Janes, Department of Food Science, LSU AgCenter**

**Issue:** A major concern of the poultry industry is the contamination of raw poultry products with *Salmonella* and *Campylobacter* species. A possible solution for controlling these foodborne pathogens is edible films containing antimicrobial agents such as nisin, lysozyme or lauric acid. We determined the inhibitory activities of ethylenediaminetetraacetic salt (EDTA) with or without zein edible films containing nisin coated onto the surfaces of raw chicken for protection against *Campylobacter jejuni* (CJ) at refrigerator temperatures.

**What was done:** An initial 7.5 log CFU/g inoculum of *C. jejuni* on the surface of chicken dropped to about 4 log CFU/g at day 14 through 28 at 4°C. EDTA alone and zein coatings

containing nisin reduced *C. jejuni* counts to non-detectable levels on the surface of raw chicken from 14 to 28 days. The Zein coatings + EDTA and zein coatings containing nisin + EDTA reduced *C. jejuni* counts to non-detectable from 7 to 28 days. The *C. jejuni* counts on raw chicken samples coated with nisin or zein alone were not significantly different from the controls counts through out the 28 days. Our results indicated that zein coatings with antimicrobial agents and/or EDTA show promise for the control of *Campylobacter* on the surface of raw chicken.

**Impact:** Edible films and coatings containing antimicrobial agents have the potential to control foodborne pathogens on the surface of food products. The promising results of our research demonstrated the zein coatings containing nisin and/or EDTA could control *Campylobacter jejuni* on the surface of raw poultry.

**Source of funding:** Hatch

## **Federal Goal 2**

**Title: Edible Film Coating and Quality Evaluation of Fresh-Cut Apples**

**Key Theme: Food Safety**

**Witoon Prinyawiwatkul, Associate Professor, Department of Food Science, Louisiana Agricultural Experiment Station**

**Issue:** Fresh-cut produce sales are estimated at \$10 billion. Consumers are more demanding for minimally processed foods. Minimal processed fruits and vegetables are highly nutritious, but highly perishable. Removing the skin from the surface or altering the size leads to leakage of nutrients, accelerated enzymatic reactions, rapid microbial growth, color and texture change, and weight loss, resulting in deteriorated quality of the product. Many techniques, including edible coating, have been studied to overcome these problems and extend the shelf life of fresh produce. Maintaining the quality and safety of fresh-cut produce is still a major challenge for the food industry.

**What was done:** Crawfish chitosan may be utilized to produce edible film or coating similar to those conventionally produced from polysaccharide-based or protein-based materials and other crustacean shell wastes. Chitosan is an inherent antimicrobial agent, and thus when used as a coating on fresh-cut fruits, vegetables, or meat products may prolong their shelf life. We studied antimicrobial properties of chitosan against *Listeria monocytogenes* (LM) and *Escherichia coli* 0157:H7 (EHEC). Antimicrobial properties of chitosan against LM and EHEC may be affected by storage temperature/time; however, this has never been investigated. Our objective was to evaluate effects of molecular weight and concentration of chitosan on its antimicrobial properties against LM and EHEC during a 4-week storage at +25C, -4C and -20C. Both 0.5 and 1 percent chitosan solutions (in 1 percent acetic acid) were prepared from high (1,100 kDa, HMw) and/or low (470 kDa, LMw) molecular weight chitosan. Each chitosan solution was pH-adjusted to 5.6,

stored at +25C, -4C or -20C, and drawn for analysis at weeks 0 (day 0), 1, 2, 3, and 4. Acetic acid and PBS solutions were the controls. Overnight cultures of LM and EHEC were diluted and inoculated into chitosan and control solutions.

Each solution was plated on to UVM and SMAC agar plates, incubated, and CFU/mL determined. At day 0, a 2-log CFU/mL reduction of EHEC was observed in 1 percent-HMw and 0.5 percent-LMw chitosan solutions, while a 2.5-log CFU/mL reduction of LM in 1 percent-LMw solution. Antimicrobial potency of chitosans decreased with increased storage time. At week 4, there was no significant difference in EHEC counts among chitosan vs. control solutions. Regardless of storage temperature/time, higher chitosan concentration was more effective against LM and EHEC. The 1 percent-LMw chitosan caused greater CFU/mL reductions for LM. The LMw chitosan (both 0.5 and 1 percent) was more effective against LM than HMw, especially at -4C and -20C, while 0.5 percent-LMw chitosan at +25C was least effective against EHEC. Plasticized whey protein coatings have been shown to extend the shelf life of fresh produce. We determined quality of fresh-cut apples coated with whey protein during 13-days refrigerated storage. The cut apples were coated with 0 (water as the control), 5 or 10 percent of whey protein concentrate (WPC), whey protein isolate (WPI) or partially hydrolyzed whey protein concentrate (PHWPC). All samples were stored in sealed plastic containers at 2C and evaluated for color, texture, firmness, moisture loss and microbial safety (total plate count and *E. coli*/Coliform) after 1, 4, 7, 10 and 13 days of storage. 10 percent WPC coating was most effective in minimizing weight loss with 1.8 percent moisture loss observed after 13-days storage. There were no changes in color lightness of samples coated with WPC or WPI, whereas significantly decreased lightness was observed for the control after 4-days storage. 5 and 10 percent WPC coated apples turned brown, respectively, after 7 and 10 days of storage. Firmness of the coated samples did not change after 13-days storage compared to that of the control which was undesirably soft. The 10 percent treatments were better than 5 percent treatments in maintaining firmness. The total plate count ranged from 0.3-5.0 CFU/g after 10-days storage. No *E. coli*/Coliforms were detected during 13-days refrigerated storage. Probit Analysis of Consumer Perception of Fresh-Cut Fruits and Vegetables (FCFV) and Edible Coating was conducted. About 7 percent increase in purchase intent was observed after advantages of edible coating had been described.

**Impact:** Consumer demand for ready-to-consume fresh-cut fruits and vegetables has increased. The combined minimal processing used to prepare fresh-cut fruits and vegetables causes quality deterioration at a faster rate than normally observed in whole raw/unprocessed fruits and vegetables. Post-harvest microbial growth and decay of fresh-cut fruits and vegetables can be controlled or reduced. The crawfish chitosan edible coating with added microbiocides is anticipated to extend shelf life and assure desirable quality of fresh-cut produce. The information from the consumer survey will help the food industry meet the consumer and market demand on fresh-cut fruits and vegetables.

**Sources of funding:** State and Hatch

### Goal 3

LSU Ag Center Goal 3 is to achieve a healthier, more well-nourished population by improving dietary quality, food quality, and food choices of Louisiana citizens.

#### Research Reports

Folic acid deficiency has been reported as a factor in infant defects, heart disease, and some types of cancer. Because the vitamin cannot be synthesized by humans, it must be provided through the diet. Research to examine the effect of adding folic acid to fat free yogurt revealed that the addition did not adversely impact the product characteristics. Also, there were no significant losses of folic acid on pasteurization which would enable processors to follow HACCP requirements relative to production of safe dairy foods.

Research demonstrated that pharmaceutical proteins could be expressed in egg white of transgenic chickens. This technology has the potential of lowering drug costs for the consumer and produces transgenic chickens at rates previously not possible, with protein being expressed in eggs at commercially viable rates. Integration of this industry into an already established poultry layer industry in Louisiana can lead to enhanced economic development.

Components in rice bran oil were evaluated relative to their potential as anticancer agents. Gamma-tototrienol (g-T3) was the most effective component. The rice bran oil induced morphologically detectable cell death (apoptosis) in cancer cells such as breast, liver and immune cells. Two prominent mechanisms by which rice bran oil and its components may affect cancer are apoptosis and as potential *in vivo* antioxidants.

Novel treatments for both prostatic and breast cancers have been discovered. These are composed of ligands linked to membrane-disrupting peptides. The ligands are small protein hormones, which direct the membrane-disrupting peptide to cancer cells with cancer membrane receptors for the ligand. Even metastatic cancer cells are selectively destroyed by these compounds. It appears the only side effect is a loss of fertility.

#### Extension Reports

Examples of accomplishments in Extension programs:

- In the adult EFNEP program, 2703 enrolled families with 9,106 members made positive dietary changes. Significant increases were made from program enrollment to graduation in the recommended daily consumption of servings of milk and milk products (8% to 27%), fruits (18% to 35%), vegetables (27% to 45%), breads and cereals (26% to 35%), and meat (46% to 57%). Homemakers were also managing their food dollars more wisely. At program exit, proportions of homemakers who more often shopped were 51% for comparison shopping, 58% for planning meals in advance, and 60% for shopping with a grocery list. The youth EFNEP program reached 4,797 youth. As a result of the

program, 45% of the enrollees ate a variety of foods, 49% increased their knowledge of basic nutrition, 39% increased their ability to select low-cost, nutritious food, and 42% improved food safety practices.. A total of 679 volunteers assisted in delivering the adult and youth programs.

- In 35 FNP parishes (counties), a total of 123,066 people, including 39,443 youth, were provided information on nutrition and food buying. Comprehensive evaluation of the program showed that over one-third of respondents surveyed reported learning how to read nutrition labels, the importance of adequate nutrition for development of children, and the use of the food guide pyramid in family meals planning; one-half of the respondents learned how to choose a diet rich in fruits and vegetables, with at least two servings of low-fat dairy products, moderate in sugar, and lower in salt.
- To combat the growing incidence of childhood obesity, a 10-week youth nutrition workshop was conducted with 4,000 youth learning basic nutrition and health concepts.

Total Extension expenditure on Goal 3 programs was \$5,296,188. Of this total, multi-state expenditure was estimated at \$630,612 and multi-function expenditure at \$673,132.

A total of 66.09 FTEs were devoted to Goal 3 programs and 581,051 educational contacts made.

**GOAL 3**  
**EXTENSION SUMMARIES**

### **Federal Goal 3**

#### **EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM**

##### **Key Theme: Human Nutrition – EFNEP**

**Heli Roy, Associate Professor (Nutrition), School of Human Ecology, LSU AgCenter**

##### **Program Description**

Fourteen Louisiana parishes participated in the Expanded Food and Nutrition Education Program (EFNEP). EFNEP worked cooperatively with other food assistance programs such as food stamp, WIC, and commodity foods. Fifty two EFNEP nutrition assistants conducted a special nutrition education program for low-income families with young children. Through EFNEP, families learned about healthy eating, how to make more nutritious choices for foods, and how to extend their limited resources better when shopping for food. A planned curriculum of 12 lessons was taught to enrolled participants and their children in small groups. To graduate from the program, participants completed a minimum of 10 of the 12 lessons. Eighty-eight percent of the enrollees completed the program.

Actions were taken to seek stakeholder input. The EFNEP staffs in the parishes sought input from stakeholders in face-to-face meetings and in advisory committees of various local organizations and agencies, local government and business officials, schools, churches, and community agencies. Recruitment of clients was done through new member orientation classes for young homemakers, religious organizations, client referrals, homeless shelters, Head Start, schools, Social Services, and the media.

Stakeholders were identified in each of the parishes. Individuals with leadership ability were invited to participate in an advisory committee.

Mass media, government agencies, religious organizations, and person-to-person contacts were used for recruiting purposes and to disseminate program information. Health fairs were used as a recruiting technique for potential clientele and organizations and to disseminate information about the EFNEP program.

Stakeholders requested information and programs relative to: recommended dietary guidelines; reducing fat, sugar and salt in the diet, nutrition and diabetes, high blood pressure, high cholesterol, weight reduction and other health related problems; food safety; selecting healthier meals, selecting healthier snacks for children, the importance of exercise and physical activity in daily routine; making lifestyles changes to prevent chronic diseases and obesity.

Group lessons were held in homes, extension offices, libraries, schools and other public facilities. Individual home visits and group lessons were conducted monthly by nutrition educators. EFNEP fact sheets and other Extension literature were distributed to homemakers.



Nutritional displays were set up at health fairs with nutritional literature on recommended dietary guidelines and how to reduce fat, sugar, and salt in the diet.

Food safety displays and educational literature on the safe handling of food were set up at various agencies.

Health fairs and expos were held in a number of parishes: East Baton Rouge, Assumption, Iberville, Richland, East Carroll, Washington, Tangipahoa, and Orleans.

Extension literature was distributed, and food demonstrations were conducted in collaboration with the following agencies: Parish Office of Family Support; Parish Police Jury; schools; Parish Health Units; teen moms; LSU Hospital Social Services, Project Independence, School System's HIPPY Program; UpLIFTD; DHCI Vocational School; Baby Fresh Start; Mental Health Rehabilitation (MHR); Alliance House; New Horizon Head Start; YWCA's Even Start Program; Capitol High School (FCS classes); Reality House; Charity Christian Preschool; East Baton Rouge Head Start Grandparents Program; Istrouma Early Start Head Start (teen parenting program); Istrouma High (FCS classes); Southern University's Violence Prevention Program; Baranco Clark YMCA; Louis Jetson Center; Audubon Council Girl Scouts; Even Start Program; commodity distribution sites; Louisiana Technical College (nursing assistants, medical assistants, and GED classes); OPAC summer day camp; Project IMPACT summer program; Assumption High School (FCS classes); Brusly Middle School; St. Phillip Methodist Church; USDA-ARS Mississippi Extension Service; Orleans Parish Schools Parent Involvement Program; and Total Community Action Head Start Program. EFNEP nutrition educators met with targeted youth groups, parent groups, and teen moms.

Collaborating agencies and groups included: Health Units; Parish School Board; Police Jury; Workforce Development Center; Vocational Technical Training Centers; Hospitals; Council on Aging; Community Action; Sheriff's Department; Office of Family Services; Head Start; Day Care Centers; Louisiana Technical College; COPAC; Office of Family Support; High Schools/Parish School Systems; HIPPY Program; UpLIFTD; DHCI; Baby Fresh Start; Mental Health Rehabilitation; Alliance House; Even Start; Nursing homes; Charity Christian Preschools; EBR Head Start Grandparent's Program; Early Head Start; YMCA; Community Centers; Girl Scouts; Southern University; Alpha Youth Program; Love Missionary.

### **Program Impact**

In 2002-2003, the LSU AgCenter's EFNEP program, funded by USDA Cooperative State Research, Education, and Extension Service (CSREES) was delivered by 12 home economists and 57 paraprofessionals in 14 parishes. EFNEP is part of Smith-Lever base federal funding. EFNEP clients are enrolled in the program for one year and taught a 12 lesson series, "Eat Healthy" on nutrition and food buying. A 24-hour dietary recall is conducted in the beginning and at the end of the year to assess change in eating habits due to the educational sessions. In 2002-2003 there were

paired entry and exit food recalls taken on 2,703 families with a total of 9,106 persons. Results are as follows:

- 58% were enrolled in Food Stamps
- 35% were enrolled in WIC
- 36% were enrolled in Child Nutrition
- 16% of the children were in Head Start
- 24% were enrolled in EFNEP only
- 87% were African American, 10% were Caucasian 2% were Hispanic

At Program Exit:

- 58% more often planned meals in advance
- 51% more often compared prices when shopping
- 44% less often ran out of food before the end of the month
- 60% more often used a list for grocery shopping
- 57% more often thought about healthy food choices when feeding their family
- 44% more often prepared food with less salt
- 75% more often used the Nutrition Facts Label to make food choices
- 45% reported that their children ate breakfast more often
- EFNEP homemakers increased their consumption of milk as a result of being in the program. Milk was missing in over half of the homemakers' diets when they entered the program. When they exited the program, almost 65 percent had one or more servings of milk. Only 8 percent of homemakers consumed the daily recommended amounts of two or more servings of milk a day upon program entry. Upon program exit, 27 percent did.
- Meat consumption of 2+ servings increased from 46 percent at program entry to 57 percent at program exit.
- Homemakers increased their consumption of fruits as a result of participating in EFNEP. When homemakers entered EFNEP, fruit was missing in 67 percent of their diets and only 18 percent had the recommended number of two or more servings of fruit a day! Upon program exit, 35 percent of homemakers consumed two or more fruits and 67 percent of homemakers had one or more servings of fruit a day.
- Vegetable consumption was also low in the diets of homemakers when they first enrolled in EFNEP. Only 27 percent had the recommended daily intake of vegetables of 3+ servings. Upon completion of the program, 45 percent had!
- The consumption of the daily recommended number of servings of breads and cereals (6-11 servings) increased from 26 percent to 35 percent from program entry to program exit.
- About 8 percent had one or more servings of each of the four food groups when they entered EFNEP. Upon program exit, 31 percent of the families had one or more servings of each of the four food groups.
- 62 percent more often followed the recommended practices of not allowing meat and dairy foods to sit out for more than two hours. Furthermore, 37 percent always follow the recommended practices.

There were 4,797 EFNEP youth enrolled during FY02-03.

- Fifty six percent were females and 44 percent were males. Most were between 9 and 13 years of age.
- 67 percent lived in central cities over 50,000
- 29 percent resided in towns under 10,000 and rural non-farm areas.

Two methods were used to reach EFNEP youth. Youth were 1) taught nutrition lessons in group meetings each month by the nutrition educators, or 2) they were taught directly by volunteer leaders. Volunteer leaders were recruited and trained by professional EFNEP agents. A predetermined EFNEP nutrition curriculum was taught. Each month, all youth were taught the same lesson. Meetings were conducted in homes, churches, community centers, and schools. Each lesson included the objective, nutrition subject matter and learning experiences youth participated in to accomplish the objective, and a show-and-tell. All youth were given a take-home fact sheet monthly that included the main points of the nutrition lesson. In addition to the monthly youth meetings, each parish conducted summer day camps or other special youth events. As a result of the program:

- 45% of youth now eat a variety of foods
- 49% increased knowledge of essential human nutrition
- 39% increased their ability to select low cost, nutritious food
- 42% improved practices of food safety

There were 396 volunteers recruited in the 14 parishes to deliver the EFNEP program for a total of 4.4 FTEs.

- 85% were African American, 13% were Caucasian
- 56% were former EFNEP participants

There were 283 volunteers that were recruited in the 14 parishes to deliver the EFNEP program to the youth.

- 83% were African American, 13% were Caucasian, 2% were Asian
- 55% were former EFNEP participants

**Impacts for specific parishes:**

**Assumption:** Clients learned to read the Nutrition Facts Label. Clients also learned the importance of a healthy diet with physical exercise.

**Caddo:** Taught a nutrition inservice to Center for Behavioral Health. Among the 9 women, all said they would exercise, better plan meals, drink more milk and cut the fat.

350 youth gained knowledge on various nutrition related subject matter. 50% of the participants were receptive to changing their food habits.

**East Baton Rouge:** Fifty-five percent of homemakers gained knowledge and showed improvement in nutrition practices by following the dietary guidelines.

**East Carroll:** 440 families and 780 youth gained knowledge to improve their nutrition and health. 100% plan to work toward following the dietary guidelines. 75% of EFNEP families and youth report improved food preparation techniques learned through group meetings, home visits, and literature presented monthly by the nutrition educator.

500 or more persons gained knowledge because EFNEP nutrition educators answered questions, provided educational literature with a display at 3 health fairs on reducing salt, sugar and fats in the diet.

**Madison:** 525 EFNEP families learned the importance of exercising and also safe food handling. They completed 12 lessons geared to food and nutrition wise, use of food stamps, and use of the food commodity program.

**Orleans:** 277 youth, age 9-18 years, and 31 adults, age 19-55, took part in fun and fitness activities and applied knowledge received on FGP, nutrition facts label, and the importance of physical activity. Each month some 1,250 – 1,300 youth learned about the food guide pyramid. Most were able to identify food groups and the nutrition each provided. Youth reported they will try to eat more foods from the 5 food groups of the FGP and less foods from the top of the FGP following EFNEP lessons taught by nutrition educators in the summer youth program.

**West Baton Rouge:** Fifty percent of homemakers gained knowledge and reported improvement in nutrition practices (plan meals, make healthy food choices, read nutrition labels, etc)

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c, d)

### **Scope of Impact**

In FY 2003, 57 EFNEP nutrition assistants in 14 parishes reached 2,703 families with a total of 9,106 persons. The program registered 539 volunteers equaling 5.1 FTEs. An estimated 54 FTEs was spent on the EFNEP Program for about \$4,327,344.

Multi-state: The EFNEP Coordinator and Technology Support Associate participated in monthly conference calls with southern region EFNEP coordinators from Texas, Arkansas, Mississippi, Alabama, Florida, South Carolina, North Carolina, Oklahoma, Kentucky, Georgia, Tennessee, Virginia, and Puerto Rico. They attended regional, and national EFNEP coordinators' meetings on planning the program, sharing educational materials, presentation of curricula, and evaluation of impact of the program. The Texas Agricultural Service and other southern region Extension services participated in EATSMART curriculum, a certification program for EFNEP paraprofessionals. Approximately \$270,000 was attributed to multi-state efforts.

Multi-function: The LSU School of Human Ecology has collaborated with EFNEP to develop evaluation protocols, a nutrition research teaching nutrition lab, and preceptor supervision for dietetic interns. Contributions from research counterparts included assistance in determining program needs through focus groups, meetings, development of nutrition education materials, agent training and presentations for clientele. It is estimated that 30% of FTEs allocated to this

program is attributable to multi-function work. The dollar equivalent of multi-function work is \$312,530 (13 FTEs x \$80,136 per FTE x .30).

### **Federal Goal 3**

#### **FOOD AND NUTRITION PROGRAM (FNP)**

##### **Key Theme: Human Nutrition**

**Annrose Guarino, Assistant Professor (FNP Coordinator), School of Human Ecology, LSU AgCenter**

##### **Program Description**

Extension Family and Consumer Science agents covering 35 parishes and 15 nutrition educators in targeted parishes conduct Family Nutrition Programs (FNP) to assist food stamp recipients and potential food stamp recipients improve their diets and budget their food dollar. All FNP parishes have been actively involved in community education and outreach programs. Twenty parishes have a paraprofessional to help conduct the FNP program. The main nutrition topics covered by FNP included the Food Guide Pyramid, Dietary Guidelines for Americans, fruits and vegetables, fats, physical activity, healthy weight, food safety, and food buying/budgeting. A monthly newsletter covered different nutrition topics: physical activity, fats, nutritional content and benefits of different foods (fish, milk, potatoes, cereal), and commodity foods (canned fruits, canned meats). Reported sites for the FNP outreach program included commodity distribution sites, eligible low income schools, WIC clinics, and Head Start centers.

The most significant achievement for FNP during FY 2003 was the collaboration with eligible schools, reaching and educating low-income children about nutrition, healthy eating habits, and importance of regular physical activity. During FY 2003, a total of 39,443 eligible youth (32% of total 123,066 FNP audience) were reached through FNP.

FNP participants play a significant role in the planning and development of nutrition education outreach. Food Stamp recipients are surveyed regarding selected demographics, age of members in the family, and areas of interest for nutrition education. Providing program delivery in the local Food Stamp office allowed the eligibility caseworkers and office staff to have ongoing input on the objectives and goals of the program. Low-income families were members of program advisory councils and curricula review teams to assure the needs of the target audience were met.

A program enrollment form was used to survey the needs of all enrolled participants, encouraging direct client impact on the subsequent delivery of nutrition education topics.

FNP program faculty received a list of parish Food Stamp recipients. The 35 FNP parishes provided direct contact with selected Food Stamp recipients with telephone numbers and current

address to offer access to the program and to collect input. The Office of Family Support provided ongoing monitoring and input regarding the needs of the Food Stamp recipients.

Enrollment forms and phone consultations indicated the most popular and requested nutrition education topics as suggested by the stakeholders and additional teaching resources and training was provided to field faculty to deliver these identified programs. Additional programs were conducted to meet the increased demand for selected topics. FNP enrollment data in 2002-2003 included gender, race, education, number of children, health conditions identified by the client, participation in assistance programs, and lessons received. Program planning incorporated this information to meet the identified needs of the target audience. From October 1, 2002 through September 2003, 12,048 clients were enrolled.

State agencies that worked closely with the FNP program to enhance programs and improve community impact were the Governor's Office of Elderly Affairs, the Department of Education, the Department of Public Health, the Department of Health and Hospitals, the US Dept of Agriculture, the Association of Independent Grocers, and the Southeastern Dairy Association.

The LSU School of Human Ecology collaborated with FNP and EFNEP to develop evaluation protocols, a nutrition research teaching nutrition lab, and preceptor supervision for dietetic interns.

The EFNEP and FSNEP Coordinators from 1860 and 1890 Extension Services in LA, TX, MS, AR, OK, TN, KY, VA, NC, SC, GA, FL, AL, and Puerto Rico collaborated on program design, implementation, and evaluation.

The Texas Agricultural Extension Service worked closely with FNP to guide the EATSMART: Eat for Better Health Nutrition Assistant Certification program.

### **Program Impact**

Extension agents in 35 parishes and the 15 FNP nutrition educators reached over 123,066 people with information on nutrition, diets and health, and food buying through the FNP program (50,355 direct contacts and 72,711 indirect contacts).

Main topics covered through nutrition education activities included nutrition/diet/health, food safety, and food buying/budgeting. The most frequently reported sites for outreach and nutrition education in the parishes include Office of Family Support, Commodity Food Distribution sites, schools and housing developments.

Impact statement data from parishes showed that after participating in FNP, the vast majority of individuals indicated that they learned about several nutrition and health-related concepts. More specifically, over three-fourths of those surveyed indicated that they learned to read the nutrition labels to make health food choices, the importance of adequate nutrition for the child's development, and to use the food guide pyramid when planning meals for the family.

Additionally, over half of individuals surveyed indicated that they learned to choose a diet abundant in fruits and vegetables, with at least 2 servings of low-fat dairy products, moderate in sugar, and lower in salt after participating in FNP. On the other hand, 20 out of 114 surveyed indicated that they did not learn to choose a diet moderate in sugar and about the same number of individuals indicated that they obtained this knowledge prior to FNP participation. 30% of surveyed individuals indicated that they learned, through participation in FNP, the importance of completing 30 minutes of moderate exercise most days of the week.

As part of the state childhood obesity prevention initiative, Louisiana State University Agricultural Center (LSU AgCenter) nutrition and 4-H agents conducted nutrition education sessions for 4-H club members (from low-income schools) during a 10-week summer camp. The purpose of the nutrition program during the summer camp was to educate youth about the importance of healthy eating and regular physical activity in prevention of overweight and obesity.

One-hour nutrition sessions were conducted 3 times a day, for 3 days each week. Different groups of low income 4-H'ers participated in each session. The Health assembly program was used as teaching material. The nutrition program addressed four topics: making low-fat choices, eating high-fiber foods, drinking lots of water, and exercising regularly. Before each session all participants completed a pre-test (five questions) that addressed different nutrition topics covered by the "Basic Training for Better Health" program. The same test was given to all participants after the session (post-test).

A total of 3,722 children (1,419 boys and 2,303 girls) were reached during the 10-week period. A total of 2,193 children (59%) of those attending camp completed and returned the pre and post-tests

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c, d)

Family Nutrition Program (FNP), Food Stamp Nutrition Education Program funded by USDA, Food Nutrition Services (FNS), through the Louisiana Department of Social Services, Office of Family Support, Food Stamp Program

### **Scope of Impact**

Multi-state: The Family Nutrition Program (FNP) is part of the National Food Stamp Nutrition Education Program sponsored by USDA, Food and Nutrition Service. The EFNEP and FSNEP Coordinators from 1862 and 1890 Extension Services of the Southern Region of CSREES meet at several annual meetings and monthly via conference calls to plan and coordinate the southern region's nutrition education outreach for low-income families. An electronic list-serv provides an excellent medium for daily communications regarding curricula selections, staff training and

supervision, and reporting and evaluations among the 14 Southern Region CSREES states: LA, TX, MS, AR, OK, TN, KY, VA, NC, SC, GA, FL, AL, and Puerto Rico.

Louisiana EFNEP and FNP faculty contributed to a web based paraprofessional training curriculum, Eat Smart. The web based training curriculum includes more than 25 nutrition education modules that are available through Internet access to Louisiana and other states. The training program incorporates pre and post-test components and provides the basis of the Nutrition Assistant Civil Service Certification program. In addition to the Internet curriculum, a workbook developed by the Texas Agricultural Extension Service serves as an additional tool to assist the nutrition educators in the certification process. The information in the manual complements the Internet curriculum and is used as a supplement to enhance learning.

In FY 2003, an estimated 15 FTEs were spent on Food Stamp Nutrition education, resulting in 123,066 contacts. Based on an FTE cost of \$80,136, the total cost of the program was \$1,202,040. Of this effort, 30% is involved in the acquisition and sharing of resources and information through multi-state efforts, valued at \$360,612. (15 FTEs x \$80,136 per FTE x .30).

Multi-function: State agencies that work closely with the FNP program are the Governor's Office of Elderly Affairs, the Department of Education, the Department of Public Health, the Department of Health and Hospitals, the US Dept of Agriculture, the Association of Independent Grocers, and the Southeastern Dairy Association. These agencies work closely with FNP to enhance our programs and improve our community impact.

The LSU School of Human Ecology has collaborated with FNP and EFNEP to develop evaluation protocols, a nutrition research-teaching lab, and preceptor supervision for dietetic interns.

Contributions from research counterparts included assistance in determining program needs through focus groups, meetings, development of nutrition education materials, agent training and presentations for clientele. It is estimated that 30% of FTE allocations to this program is attributable to multi-function work. The dollar equivalent of multi-function work is \$360,612 (15 FTEs x \$80,136 per FTE x .30).



## **Federal Goal 3**

### **NUTRITION EDUCATION PROGRAMS FOR YOUTH**

#### **Key theme: Human nutrition**

**Catrinel Stanciu, Extension Associate (EFNEP, FNP), School of Human Ecology, LSU AgCenter**

#### **Program Description**

Childhood obesity has doubled in the past 20 years with 10 million children classified as obese. Childhood obesity is epidemic in Louisiana. Children are at risk for developing poor eating habits. Almost one in three Louisiana school-aged children is overweight. Obese children are likely to remain obese as adults, and they face health care risks and costs greater than those faced by their counterparts who are not overweight or obese. Children in Louisiana are at risk of inadequate fruit and vegetable intake and often do not have access to regular physical activity. The Dietary Guidelines for Americans encourage adequate fruit and vegetable intakes and embrace maintenance of a healthy weight and improved fitness level.

As part of the state childhood obesity prevention initiative, LSU AgCenter nutrition and 4-H agents conducted nutrition education sessions for 4-H club members during a 10-week summer camp. The purpose of this nutrition program was to educate youth about the importance of healthy eating and regular physical activity in prevention of overweight and obesity. One-hour nutrition sessions were conducted 3 times a day, for 3 days each week. Different groups of 4-H'ers participated in each session. A total of 3,722 children (1,419 boys and 2,303 girls) were reached during the 10-week period. Of 3,722 children, 3,105 (83.4%) were White, 574 (15.4 %) were African American, 19 (0.5%) were Hispanic, 15 (0.4%) were Asian, and 9 (0.2%) were American Indians.

The OrganWise Guys® - Basic Training for Better Health assembly program was used as teaching material. The "Basic Training for Better Health" is an interactive program that helps educate children on important nutrition concepts while being physically active and having fun at the same time. The program addresses four topics: making low-fat choices, eating high-fiber foods, drinking lots of water, and exercising regularly. These concepts were presented to participants and then reinforced through different activities and games. After participating in the nutrition class, each 4-H member was acknowledged as an active member of the "OrganWise Guys® Platoon" and received a certificate.

Before each session all participants completed a pre-test (five questions) that addressed different nutrition topics covered by the "Basic Training for Better Health" program. The same test was given to all participants after the session (post-test). A total of 2,193 children (59%) of those attending camp completed and returned the pre and post-tests. Results showed an improvement in knowledge between the pre and the post-test.

The 2003 4-H State Food & Fitness Camp focused on healthy eating and importance of regular physical activity. The theme of the camp was “Piecing the world together”. A total of 42 youth, ages 10-13 from 22 parishes, accompanied by teen and adult volunteer leaders (29), participated in numerous activities conducted by the 4-H State Food & Fitness Board members (16) and their advisors.

Projects included hands-on activities focused on nutrition, food preparation, food safety, and fitness. Lessons were developed by the 4-H State Food & Fitness Board members, under the coordination of faculty advisors. Board members conducted food demonstrations to show campers how to prepare healthy dishes from five different countries. Presenters also discussed the nutrient content of the foods and the importance of following the food safety guidelines. Campers and board members also participated in a community service project that focused on elderly nutrition. All camp participants (87) visited a nursing home and conducted nutrition and physical activities with the residents.

**Program Impact**

Nearly 4,000 youth learned basic nutrition and health concepts in the 10-week long youth nutrition program.

**Sources of Funding**

State and Federal (Smith Lever 3 b, c)

**Scope of Impact**

Multi-state: State only

**Deleted: Appendix 1¶**  
 ¶ FY 2003 LSU Ag Center Annual Report for USDA-CSREES¶  
 Guidance on Preparation of Research Project Reports¶  
 ¶ The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:¶  
 ¶ *Goal 1.* An organized agricultural system that is highly competitive in the global economy.¶  
 ¶ *Goal 2.* A safe and secure food and fiber system.¶  
 ¶ *Goal 3.* A healthy, well-nourished population.¶  
 ¶ *Goal 4.* Greater harmony between agriculture and the environment.¶  
 ¶ *Goal 5.* Enhanced economic opportunity and quality of life for Americans.¶  
 ¶ Reports of research projects under each of the five goals are to be prepared in a specific format. The format is indicated below along with explanation of the procedure to be followed and the supporting/explanatory material to be used in developing reports of research projects.¶  
 ¶ *Title of Research Project:* Specify the title of the research project being reported. ¶  
 ¶ *Federal Goal:* Indicate goal number (1, 2, 3, 4, 5).¶  
 ¶ *Key Theme:* Select an appropriate theme related to the research project from the list of themes specified for each g( ... [2]

**Deleted: -----Page Break-----**  
 GOAL 3 EXTENSION SUMMARIES:  
 Federal Goal 3 ¶  
 ¶ **FOOD AND NUTRITION PROGRAM (FNP)¶**  
 ¶ **Key Theme: Human Nutrition¶**  
 ¶ **Program Description¶**  
 ¶ Extension Family and Consumer Science agents covering 35 parishes and 15 nutrition educators in targeted parishes conduct Family Nutrition Programs (FNP) to assist food stamp recipients and potential food stamp recipients improve their diets and budget their food dollar. All FNP parishes have been actively involved in community education and outreach programs. Twenty parish( ... [3]

**Comment [sv1]:**

**GOAL 3**  
**RESEARCH SUMMARIES**

### **Federal Goal 3**

#### **Title: Functional Dairy Foods**

#### **Key Theme: Nutraceuticals**

**Kayanush J. Aryana, Assistant Professor, Department of Dairy Science, LAES, LSU AgCenter**

**Issue:** Consumer demand exists for good tasting foods, containing few calories and increased health benefits. Folic acid deficiency has been reported as a factor responsible for neural tube defects, coronary heart disease, and cervical cancer. Folic acid cannot be synthesized by humans / mammals and must be provided through diet. Good natural sources of folic acid include green vegetables and organ meats. Dairy products are not good natural sources of folic acid. Breads and cereals are fortified with folic acid. With the advent of the Atkins low carbohydrate diet, there is increased emphasis on protein consumption. Fat free yogurt is a protein based dairy product. Moreover, yogurt is a popular dairy product that is consumed as a snack food and a dessert. Making yogurt a good source of folic acid could enable residents of Louisiana and the world, to enjoy health benefits such as reduced risk of neural tube defects in fetuses, vascular disease, and certain cancers. These health benefits could be enjoyed at almost the same price currently being paid for the products. These added benefits could facilitate increased consumer attraction to this low caloric dairy product.

**What was done:** There were no changes in composition on folic acid fortification of plain and flavored yogurts. With a steady increase in concentration of folic acid (25, 50, 75 and 100% of the Recommended Dietary Allowance in a single 8 oz cup) incorporated before pasteurization, there was a steady decrease in viscosity of plain yogurts. There were no changes in viscosity of the plain yogurts over the 5 weeks of storage. There was an increase in viscosity of lemon yogurts at week 3 compared to weeks 1 and 5. Viscosities of strawberry flavored yogurts were not impacted by stage of addition of folic acid or storage time. There were no changes in pH of the plain yogurts. The titratable acidity of plain and strawberry yogurts was not impacted by folic acid concentration or stage of addition. There were no differences in syneresis of plain and strawberry flavored yogurts when comparing stages of addition, concentration of folic acid, and time of storage. No differences occurred in protein / peptide migration patterns of the plain and flavored yogurts with different concentrations of folic acid and with different stages of addition of folic acid over the 5 weeks of storage. Sensory flavor was the highest for plain and strawberry yogurts at week 1, dropped at week 3, and increased at week 5. On average, the sensory body and texture scores for yogurts were fairly high with an average of 4 out of 5.

**Impact:** Folic acid can be recommended as a vitamin that can be added to yogurts without adversely impacting product characteristics. Since there were no significant losses of folic acid on pasteurization, folic acid can be added before pasteurization, enabling processors to follow HACCP requirements in keeping with the production of safe dairy foods.

**Sources of funding:** Hatch, State

**Federal Goal 3**

**Title:** Expression of pharmaceutical proteins in egg white of transgenic chickens

**Key Theme:** Nutraceuticals

**R.K. Cooper, Professor, Department of Veterinary Science, LAES, LSU AgCenter**

**Issue:** Much of the cost associated with producing protein-based drugs is the expense associated with the manufacturing facility and the low levels of output from the current cell culture or bacterial expression systems – these facilities typically cost between \$200 to \$500 million and require years to build and receive FDA approval. The result is escalating drug costs for the consumer, or abandonment of potentially useful drugs that do not have enough economic impact to justify such capital outlay.

**What was done:** An alternative to traditional pharmaceutical protein production is being developed. This new approach uses the most prolific protein producer known to man, the white leghorn chicken, in combination with state-of-the-art biotechnology to engineer an animal that can produce pharmaceutical proteins in the white of their eggs. Pharmaceuticals produced in this manner are then purified from the white using known methods for protein purification. The technology developed at the LSU Ag Center produces transgenic chickens at rates not previously possible and expresses proteins in eggs at commercially viable rates.

**Impact:** This technology has the potential for lowering drug costs for the consumer and enabling Louisiana to become a center for pharmaceutical protein production. By integrating into an established industry, the layer industry, the LSU Ag Center can lead the way in economic development and provide the base industry to attract businesses that will provide fill and finish on pharmaceutical compounds. This means numerous, well paying jobs throughout the state.

**Source of funding:** Army STTR grant, private grants, State, Hatch

**Federal Goal 3**

**Title:** Targeted Destruction of Human Prostatic and Breast Cancer

**Key Theme:** A Healthy, Well-Nourished Population

**F.M. Enright, Professor and Head, Department of Veterinary Science, LAES, LSU AgCenter and William Hansel, Professor, Pennington Biomedical Research Center, LSU**

**Issue:** Throughout the world, prostatic cancer is the second leading cause of cancer deaths in men, and breast cancer represents the most common cause of cancer deaths in women. Current therapy is largely ineffective in both types of cancer, following spread from primary tumors.

**What was done:** A research team at the LSU Agricultural Center and at the Pennington Biomedical Research Center has discovered and tested novel cancer treatments for both prostatic and breast cancers. These are composed of ligands linked to membrane-disrupting peptides. The ligands are small protein hormones, which direct the membrane-disrupting peptide to cancer cells with cell membrane receptors for the ligands. Importantly, even metastatic cancer cells are selectively destroyed by these compounds. The only side effect of these compounds is a loss of fertility.

**Impact:** These compounds hold great promise for effective treatment for both early and advanced stages of prostatic and breast cancer with minimal side effects, i.e., loss of fertility.

**Sources of funding:** State, private grants, Dept. of Defense grant

### **Federal Goal 3**

**Title: Functional Foods Development and Evaluation**

**Key Theme: Nutraceuticals**

**J. Samuel Godber, Professor, Food Science Department, LAES, LSU AgCenter**

**Issue:** Louisiana agriculture is at a crossroad. With dwindling price supports, it has become essential to obtain maximum utility from agricultural commodities and products. Adding value to the agricultural products is now recognized as a necessary component to economic development in Louisiana. Functional foods are the fastest growing segment of the value-added food industry. Functional foods incorporate nutraceutical components into traditional food products for the purpose of increasing health benefits that may be derived from that food. A current example is the margarine product called Benecol, which includes a cholesterol-lowering component derived from pine trees. The essence of this project is to incorporate components from various sources such as rice oil and soy flour into food products with a similar rationale to that of Benecol. For example, a compound found in rice oil called gamma-oryzanol oil has a chemical structure similar to that of the pine tree derivative in Benecol and has been shown to lower serum cholesterol. Also, because it would be considered a component that occurs naturally in food it would not face the regulatory scrutiny directed at Benecol. Overall, this project focuses on the extraction, concentration/purification, functional assessment and utilization of functional components from byproducts of agronomic crops important to Louisiana and the world. The ultimate benefit will be the improved utilization of valuable natural resources in support of more healthful diets.

**What was done:** Components of rice bran oil were evaluated relative to their potential as anticancer agents. It was found that rice bran oil induced morphologically detectable cell death (apoptosis) in cancer cells such as breast (MCF-7, T-47D, and MDA-MB-435s), liver (HepG2), and immune cells (J774A.1). Gamma-tocotrienol (g-T3) was the most effective component, having more than 100-fold greater activity than rice bran oil, with MCF-7 and HepG2 cells. Both g-T3 and g-oryzanol had greater activity than anthocyanin using both HepG2 and J774A.1 cells. However, it was determined that rice bran components did not induce apoptotic activity through the MAP kinase pathway. Currently, efforts are being directed at determining whether or not rice bran components are involved in the activation of caspases as a possible mechanism for apoptosis induction using cancer cells having wild type of p53. Also, cell culture was used to evaluate the antioxidation potential of rice bran components compared to known antioxidants. Both g-oryzanol and ferulic acid were found to possess antioxidant activity in terms of preventing cellular mitochondrial damage to endothelial cells (SVEC4-10) due to peroxide (tBHP) stimulated oxidation. The three major components of g-oryzanol generally had higher antioxidant activity than g-oryzanol and in the situation when associated with cells before and during tBHP oxidation, they were more potent antioxidants than alpha-tocopherol. Among the three major components of g-oryzanol, 24-methylene cycloartanyl ferulate was found to be relatively more effective.

**Impact:** Cancer is one of the leading causes of death in the U.S. and world. Diet has been implicated in both causing and preventing various types of cancer. Recognition of dietary factors that potentially prevent cancer is a major objective of the health related research establishment. This research is helping to clarify whether or not rice bran oil and several of its components have impact on cancer development. Two prominent mechanisms by which these components may affect cancer have been investigated: their role in apoptosis and as potential *in vivo* antioxidants. Gaining an understanding of specific mechanisms and activity of purified rice bran compounds relative to cancer prevention will further our ability to utilize rice bran as a functional food.

**Sources of funding:** Hatch, State, USDA-IFAFS, Louisiana Soybean and Grain Board

## Goal 4

LSU Ag Center Goal 4 is to achieve greater harmony between agriculture and the environment. The integrity of Louisiana's diverse ecosystem must be ensured by developing, transferring, and promoting the adoption of sustainable agriculture, forestry, and related resource conservation policies, programs, technologies, and practices.

### Research Reports

Research demonstrated that when planting *Spartina alterniflora* in dredge spoil for coastal restoration, optimal planting elevation (within the tidal zone) was critical. Image analysis was found to be a promising non-invasive technique for monitoring survival and growth of planting for creation of wetlands.

Equations were developed and the estimates of loss reduction during composting will likely be used by engineers in compost facility planning. Smaller facilities will use the estimates to determine the amount of product they will generate from various feedstocks. Studies continue to find alterations in procedures to reduce nutrient loss during composting.

In drill-seeded systems, reduced tillage practices proved to be as effective, if not more effective, than conventional tillage in reducing loss of soil and nutrients in floodwater runoff. The use of conservation tillage in certain water-seeded practices has been effective in reducing pollutants but has been detrimental to yield. Currently, slight increases in yield have been associated with conservation tillage practices in drill-seeded systems.

Research was implemented to evaluate the interactions of saltwater intrusion, lack of nutrient and sediment inputs, and insect herbivory as a precursor to planned state-federal restoration efforts in forested wetlands. Results indicated that herbivory of wetland trees acts in concert with low-nutrients to reduce tree growth. However, in areas where salinity reaches or exceeds 3ppt, salinity is the major factor in tree growth suppression and contributes to extensive tree mortality. Nitrogen loading from diverted Mississippi River water can help trees recover from stress associated with insects, flooding, and salinity.

Preliminary studies on adult stable fly control were conducted. Results of a comparison of traps designed to reduce fly populations indicate that cloth targets treated with insecticide and attached to an Alsynite Broce trap was the most effective. The data suggest that one treated target would possibly eliminate 10,000 adult stable flies per day, with an overall reduction in chemical usage.

Accurate soil testing is necessary to make reliable recommendations for fertilizer inputs to improve plant performance but also is important to prevent excessive fertilization with resulting environmental problems. Phosphorous, zinc, and silicon testing and fertilization have been the subject of investigation to address these issues. Preliminary results reveal that improvements in testing are possible. Research on the impact on poultry litter applied to crops, pastures and



forested land and resultant impact on water quality has continued. Phytoremediation of high levels of P by hay harvest is consistent with current farm operations.

## Extension Reports

Selected accomplishments in Extension programs:

- Forest landowner education was a significant program thrust in renewable natural resources programming during the year in the different regions of the state with a number of successful and positive impacts. Examples of outcomes from the several regions include: 93 forest landowners indicated they expected to make financial gains of \$618,000 from their forest resources as a result of attending forest sustainability and management education programs in Northeast Louisiana; 234 participants in the Ark-La-Tex Forestry Forum in Northwest Louisiana valued the program at \$123,070, with 50% of them indicating in a follow-up survey that they had adopted practices recommended in the Forum and six respondents placing a dollar value of \$69,500 as a result of the practices adopted; over 2,000 forest landowners and 500 4-H youth in Southeast Louisiana parishes attending a variety of education programs learned valuable knowledge on forestry production and forest-related issues; the Woods Arson Prevention Association in Southwest Louisiana succeeded in reducing the number of arson fires and the number of acres burned, resulting in a savings of approximately \$10 million per year; 174 professional loggers and resource managers attended forestry best management practices workshops and gained knowledge regarding BMP implementation needed to obtain or maintain Master Logger status.
- In the USDA-funded Formosan subterranean termite program in New Orleans all original properties and 90% of new properties have been treated. Property owners are adopting recommended treatments and the number of termites has been reduced by 50% compared to non-treated areas. This will save money and less repair and insecticide will be needed.
- Nine sites in Louisiana carried the 7-week Southeastern US Region satellite broadcast of the Master Wildlifer Program covering basic and advanced information regarding proper management of wildlife on private lands, management for threatened and endangered species, and conservation considerations. There were 219 participants. Based on reported enterprise saving of approximately \$19,947 per participant, the totals saving is \$4,368,392. Respondents also stated they expected to earn an additional \$42,827 per person or a total of \$9,379,113. Approximately 90% of the respondents expected to make changes in management practices based on what they learned in the workshop.
- Prescribed burn management certification training has been provided to 1,410 sugarcane producers since 2000. In addition, 2,000 producers and/or their representatives attended field day presentations in the summer of 2003 for more smoke management training. Complaints of burning by the general public have been declining and only five complaints were made during the 2003 harvest. Producers were also advised of studies

showing that harvesting efficiency is improved without burning; as a result, 70% of the 2003 sugarcane crop was harvested green.

- In a new multi-state initiative between Louisiana and Mississippi to reach out to underserved forest landowners, i.e., African-American women and men and Caucasian women, four workshops were held on potential income opportunities from good, proper, sustainable forest management. A total of 346 landowners attended the workshops. In a post-participation survey, 53% (184 participants) assessed the value of the information they received at \$13,576 per landowner or \$2,498,000 for all landowners. Further, nearly one-half of the landowners indicated that they had used a forester in the past, while as many as 88% said they would use one in the future. Also, 85% expected to develop a written forest management plan for their land as a result of what they learned; a survey three months later revealed that 67% had adopted recommended management practices as a result of the program.
- Natural resource and environmental education camps for youth showed that respondents registered an average increase of 14% in knowledge gained, and had significant increases in science and math school scores, career changes contemplated, and environmental awareness.
- Poultry producers improved their waste management and dead bird disposal practices, awareness of EPA regulations, TMDLs, and BMPs. They are also preparing comprehensive nutrient management and bio-security plans for their farms
- Water resources development programs focused on assisting producers develop a better understanding of and adopt optimal water systems in their operations. As a result of these programs in targeted areas of the state, farmers in many parishes have a better understanding of the amount of water available from existing systems and how to best utilize water resulting in increased crop yield and more efficient irrigation. Furthermore, working with the Corps, NRCS, and DOTD, many landowners and community leaders have developed water resources to enhance crop yields, decreased their dependence on ground water, increased surface water for recreation, public water supply, business and industry, improved surface water quality and habitat during summer months, decreased the risk of crop losses from drought, ensured that more surface water is available for recreation, public water supply, business and industry and improved surface water quality and habitat in summer months while seeing that marsh in coastal areas receives proper nourishment.
- A Coastal Enhancement Team of 11 state, area, and parish level educators formed in 2001 has increased the visibility of the wetlands and coastal resources program using the internet and electronic dissemination techniques by making a number of extension education materials more visible and accessible to various stakeholders. The team also involved youth in the Marsh Maneuvers environmental program, and worked with local, state, and federal agencies, NGOs, and individual citizens on a variety of projects.

- More than 3,000 people received wood products education information through workshops, newsletters, mail, telephone and personal visits. It is estimated that the average value of information to workshop participants was \$10,000, with approximately two-thirds of them planning business expansions. In addition, approximately 3,000 people accessed the Extension Natural Resources web site for wood products information.
- The wildlife management program involved 422 4-H youth in timber and wildlife resources conservation and management training, the outdoor skills shooting sports program, and forestry contests. Also, 363 adults were contacted through meetings and other educational activities. A continuing education white tailed deer management program impacted 33 individuals who indicated the program content was worth an average of \$5,000. A total of 278 individuals who learned licensing requirements for pesticide application in rural and urban settings reported that the value of the certification training was \$50,000 in terms of their ability to continue their control programs.

Total Extension expenditure on Goal 4 programs was \$2,063,502. Of this amount, total multi-state expenditure is estimated at \$1,429,831, and multi-function expenditure at \$1,447,657.

Total Extension FTEs on Goal 4 programs were 25.75 and 413,628 educational contacts were made.

**GOAL 4**  
**EXTENSION SUMMARIES**

## **Federal Goal 4**

### **FOREST LANDOWNER EDUCATION**

#### **Key Theme: Natural Resources Management**

**Mike Dunn, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

Five area forestry agents work with county agents in their areas to develop multi-faceted programming for forest landowners. These education programs are designed to provide landowners with the latest technical and policy-related natural resources information.

Each area agent has an advisory committee system that seeks input from stakeholder groups on an annual basis. Input received from advisory committees is carefully considered by area forestry agents in developing appropriate, need-based education programs and implemented in the best practical manner. Problems identified by stakeholders during the program year included a desire to see more forestry management and harvesting operations in the field, more wildlife management programming, and more programs on timber taxation and estate planning.

#### **Program Impact**

Outcomes of different education programs conducted during the year around the state are given below. Educational activities conducted by the area forestry agents and the behavior changes made by clientele are included in the outcome statements. These statements are organized by geographic areas of the state.

#### **Statewide**

- Agroforestry/silvopasture management on private lands can be a good way to significantly impact income opportunities for landowners. An agroforestry/silvopasture workshop targeting extension agents and public sector agency resource managers was conducted. All 25 participants (17 extension agents and 8 NRCS representatives) rated the workshop positively and committed to disseminate education materials and information generated to stakeholder groups in their respective areas.

#### **Northeast Louisiana**

- Over three hundred (300) forest landowners and forestry professionals attended meetings, field days, and received home/farm visits which made them more aware of and increased their knowledge of how to implement forestry practices which improve forest ownership economics, the environment, forest resource sustainability, and alternative forest products

such as pine straw and forage. Forest landowners also learned how to take advantage of tax laws regarding forest ownership.

- A large number of regional home owners and area municipalities were educated on proper community shade tree care and maintenance. Educational programs and consultations regarding community/urban trees increased their understanding of tree biology, site factors on tree health, planting and post-planting techniques, and pruning. These programs helped clientele and maintenance departments in successfully establishing and maintaining high value landscape and urban trees.
- Goat producers and forest landowners from four states benefited from the education program featuring the on-going silvipasture demonstration at the Calhoun research station. Goats are used to utilize the forage under existing pine timber. Land management practices that encourage enterprise diversity can achieve profitable land use alternatives for landowners. Combining agricultural commodities having compatible management requirements makes it possible to produce marketable commodities while maintaining sustainable productivity. Programs on goat herd management, silvipasture concepts, e-commerce, and marketing have benefited goat producers as well as timber producers. A presentation at the Louisiana Forage and Grass Council's annual meeting highlighted the advantages of using goats to improve pasture land by eating plants not utilized by cows and hayes. The silvipasture concept was also advocated.
- Educational programs were aimed at: (a) promoting and stimulating landowners and farmers to develop and manage natural resource-based enterprises, (b) making landowners, farmers, and rural community stakeholders aware of the potential impact of developing and promoting existing regional natural, cultural, and historical resources on farm profitability, rural community viability, and environmental enhancement, and (c) strengthening collaboration between the agricultural community, natural resource managers, and local economic development leaders through the development and marketing of existing natural and human resources. Asset mapping was conducted in 12 parishes in the Delta Region. The AgCenter cooperated with the US Fish and Wildlife Service, Office of State Parks, Louisiana Office of Tourism, and others to educate landowners, farmers, and entrepreneurs regarding opportunities and requirements of this initiative. Extension agents made presentations to civic clubs, community groups, farm groups, state legislators, and local elected officials highlighting the mission of the initiative and the benefits afforded to the entire region. A marketing plan is under way with the assistance of the AgCenter Communications Dept. that includes a promotional video (highlighting the Delta's opportunities), an educational brochure (Delta's Resources and AgCenter's Initiative), and a trade show exhibit. Over 300 landowners, farmers and individuals with an interest in the outdoors and/or economic development were presented information regarding natural resource-based enterprises. A total of 30 businesses, including banks, hunting enterprises, bed and breakfasts, restaurants, motels, crawfish farmers, farm suppliers, and other interested parties have memberships in the Delta Outdoors and Wildlife Association, an association aimed at the development, promotion, and marketing of the region's existing natural, cultural, and historical resources to bring about rural community economic development. Association members were also informed about issues and opportunities related to resource and community

sustainability. Members promote the entire region on their web site [www.deltaoutdoors-wildlife.org](http://www.deltaoutdoors-wildlife.org), have sponsored activities such as media and community tours of the region and displays at outdoor functions and shows. They will also participate in a retirement recruitment initiative sponsored by the Louisiana Office of Tourism and LSU AgCenter. As a result of these activities, news releases and magazine articles have appeared in large market areas promoting the Delta Region and its opportunities and the AgCenter's Initiative. Support from the Lt. Governor's office for the AgCenter resource management/economic development initiative has been obtained. Such endeavors have brought and will bring many newcomers to the region which will ultimately stimulate the region's economy through an increase and sustained development of natural resource-based enterprises, regional tourism, and economic diversification from supporting businesses. The impact of this program is a direct result of timely, quality, and focused educational efforts by AgCenter personnel. Program outcomes include resource management, marketing, and technical assistance, community leadership development, and job skill training.

- Fifty (50) forestry professionals and logging contractors learned how to implement forest management plans and harvest plans in accordance with the national Sustainable Forestry Initiative (SFI). This improved their ability to comply with the SFI Forestry Aesthetics Standards.
- Two (2) forest landowners adopted pine tree planting density recommendations as shown at the Calhoun Field Day.
- By practicing recommended marketing strategies three landowners successfully marketed their timber and received a higher stumpage price than they were originally offered.
- By understanding tree biology and following recommended tree care practices, clientele were impacted financially and found personal satisfaction. The result is healthy trees which improve home values, urban environmental conditions, and energy consumption.
- Adoption of silviculture management practices and proper goat herd management and marketing resulted in an increase in the number of landowners involved in these two land use concepts. Several goat producers have planted pine trees and will adopt the silvipasture system. Forest landowners, for their part, are utilizing goats on forestlands to control woody plant competition and produce a saleable product (goats) during the rotation. In response to these education programs, 35 goat producers from North Louisiana and Arkansas have been working to organize an association, Mid-South Goat Masters, for the advancement of the regional goat industry. Marketing, promotion, and education are primary goals of the association. 4-H and FFA youth and families have benefited from the "show goat" project, and there has been an increase in the number of show goat producers and exhibitors.
- A total of 10,795 students, teachers, and the general public have a better understanding and awareness of the economic importance of the forest industry and of the many products derived from trees.
- Ninety-three (93) forest landowners representing 14,609 acres expect financial gains of \$618,000 from their forest resources as a result of attending forest sustainability and management educational activities.

- Sixty-three (63) forest landowners indicated that natural resource education programs benefited them and helped them better understand the management practices that will allow for better utilization of resources. They also indicated their intention to adopt these practices.
- A total of 101 regional residents indicated that natural resource education programs have increased their knowledge of natural resource/horticultural use, and plan to adopt many of the practices and concepts presented at these programs.

### **Northwest Louisiana**

- Four (4) 4-H students placed 3<sup>rd</sup> as a team in the national 4-H forestry competition.
- Two hundred (200) school teachers gained knowledge of environmental education through Project Learning Tree.
- Eighty (80) forest landowners gained knowledge of tree farming and forest taxation in a six-hour education program.
- A total of 234 stakeholders attended the Ark-La-Tex Forestry Forum. They represented 25 parishes, 5 states, and over 2.2 million acres. Attendees valued the program at \$123,070. A follow-up survey revealed that 57% had already adopted practices as a result of the Forum. Another 25% indicated they would adopt practices in the near future. In addition, six survey respondents placed a value of \$69,500 on the practices they had adopted as a result of participating.
- In Sabine Parish, 150 stakeholders were informed of the importance of agriculture and forestry through presentations to local clubs, groups, and organizations.

### **Southeast Louisiana**

- Ninety-eight (98) forest landowners attended the Florida Parishes Forestry Forum. Of those attending, 98% stated that their knowledge regarding forest management had increased and the information would be useful in better managing their forestland.
- One hundred and thirty two (132) landowners and hunters gained forestry and wildlife management knowledge by participating in the Felicianas and East Baton Rouge forestry and wildlife field days.
- Seventy-one (71) forest landowners increased their knowledge and understanding of forestland taxation and estate planning at a Red Stick Forestry Association workshop.
- Thirty (30) forest landowners learned how quality hardwood logs are sawn and the lumber graded at the Feliciana Forestry Association hardwood sawmill tour.
- Forty-one (41) 4-H youth and extension agents gained knowledge and skills by participating in two forestry and one wildlife training sessions.
- One hundred seventy four (174) 4-H youth gained forestry knowledge and skills by competing in the forestry short course contest.
- One hundred twenty five (125) junior and senior high school FFA members gained forestry knowledge and skills by competing in the Forestry Career Development Event.



- Two hundred fifty two (252) forest landowners gained knowledge regarding state and national forestry-related issues by attending various Parish Forest Landowner Associations in the region.
- In Terrebonne Parish, (a) education programs for homeowners focused on proper selection of varieties and care of urban trees and ornamentals, (b) a community leaders' meeting promoted an urban forestry program to discuss tree-related ordinances, (c) television programs highlighted proper pruning techniques for urban trees, preparing citrus trees for frosts and freezes, urban tree fertilization, and prevention and control of termites around the home, (d) 1,000 individuals learned about hurricanes and tree care, and (e) 35 producers received training regarding urban tree care, with 75% indicating they would adopt recommended fertilization and pruning practices.
- In Livingston Parish, (a) forest landowners gained knowledge of how to pass their family farm on to their heirs using a Family Limited Partnership, and (b) 20 forest landowners learned how to market timber for the plywood market.
- In Washington Parish, 60% of forest landowners are adopting timber management and marketing processes and realizing greater returns.

### **Southwest Louisiana**

- Three hundred and fifty (350) homeowners learned how to control or ameliorate problems associated with tree insects and pathogens, and other information related to urban/shade tree care.
- Four hundred and seventy five (475) forest landowners learned to manage and/or enjoy their forestland for profit and pleasure.
- The Beauregard Forestry Association educated 100 forest landowners how to better their forestlands through management and conservation.
- The Woods Arson Prevention Association succeeded in reducing the number of arson fires and the number of acres burned, resulting in a savings of approximately \$10 million per year.
- Twenty six (26) forestry advisory committee members worked together to promote tree farming opportunities and, through leadership incentives and education, showed other forest landowners the benefits of tree farming.
- Approximately 500 pre-kindergarten through 5<sup>th</sup> grade students learned how to reduce woods arson fires through a puppet show produced by extension agents in the area.
- Two hundred (200) homeowners learned how to identify tree and shrub problems (insects and diseases) at the Southwest Louisiana Garden Festival.
- Four hundred (400) 4-H youth participated in forestry identification contests at achievement days in Allen and Evangeline parishes.
- Four hundred fifty (450) fifth graders learned the importance of forestry to the environment through participation in the Allen Parish Forestry Awareness Program.

## Central Louisiana

- Ninety three (93) landowners, resource managers, and professional loggers attending the Central Louisiana Forestry Forum gained knowledge of assistance programs, alternative land uses, and tax/legal issues on private lands.
- One hundred seventy four (174) professional loggers and resource managers attended forestry best management practices workshops and gained knowledge regarding BMP implementation needed to obtain or maintain Master Logger status in Louisiana.
- Nearly 2,000 5<sup>th</sup> graders attended Forest Awareness Week and gained knowledge regarding tree identification, wildfire prevention/control, insects and diseases that affect forests, forest management, forest products, soil and water conservation, and environmental benefits originating from well-managed forests.
- In Winn Parish, 10 forest landowners attended four quarterly landowner meetings and learned ways to benefit from timber sales, planting techniques, harvesting, and the use of prescribed fire to control brush and woody competition.

## Sources of funding

RREA, Hatch, State

## Scope of Impact

Multi-state: A total of 5.25 Extension FTEs was expended on the Forest Landowner Education Program. It is estimated that 25% of the program was multi-state effort in planning, implementation, and training. The dollar value of multi-state work is \$105,179 (5.25 FTEs x \$80,136 per FTE x .25).

Multi-function: A total of 5.50 Research-Extension FTEs was expended on the program. The program is a fully integrated research-extension effort (100%). The dollar value of multi-function work is \$440,748 (5.5 FTEs x \$80,136 per FTE x 1.0).

## Federal Goal 4

### FORMOSAN SUBTERRANEAN TERMITE

#### Key Theme: Integrated Pest Management

**Dennis Ring, Professor, Department of Entomology, LSU AgCenter**

## Program Description

The Formosan subterranean termite continues to be a serious problem in Louisiana. Properties in New Orleans are being treated for this insect as a pilot test and an education program. Treatments in the additional 16 blocks added to the program last year continued. About 90% of

the properties in the new area have been treated. Other properties will be included in the program as requirements are met. Meetings describing the program and educational meetings were held with property owners. Continuous contact was also maintained with pest management professionals (PMPs). Several meetings were held with PMPs. New properties were approved, treated, and inspected. Treatments were maintained on properties already in the program. ARS and the New Orleans Mosquito and Termite Control Board are helping in the program. PMPs continue treatments of properties. Independent monitoring of the progress of the program was continued. Inspection of properties with infrared cameras and microwave devices was begun. This allowed the program to find hidden termites.

### **Program Impact**

Virtually one hundred percent of the properties have been treated in the original treatment area. About 90% of the properties in the new area have been treated. Treatments out of the treatment area have increased to about 50 percent. Property owners are adopting the technology. The numbers of termites have been reduced by 50%, compared to non-treated areas. This will save money. There will be less repairs and less insecticide used.

### **Source of Funds**

Federal funds

### **Scope of Impact**

Multi-state: Collaboration with professionals from Texas, Hawaii, Florida, and Mississippi. Information from the National Technical Committee meeting was used to develop 20 % of the program. The dollar equivalent of multi-state work is \$88,150 (5.5 FTEs x \$80,136 per FTE x .20)

Multi-function: Multi-function efforts (integrated extension-research) are estimated at 20% of the number of FTEs. The dollar equivalent of multi-function work is \$88,150 (5.5 FTEs x \$80,136 per FTE x .20).

## **Federal Goal 4**

### **LOUISIANA FOREST PRODUCTS DEVELOPMENT CENTER OUTREACH**

#### **Key Theme: Forest Crops**

**Rich Vlosky, Professor and Director, Forest Products Development Center, School of Renewable Resources, LSU AgCenter**

#### **Program Description**

The Louisiana Forest Products Development Center (LFPDC) has implemented an outreach action plan that will help increase both awareness and adoption of LFPDC generated research, and lead to enhanced economic activity in Louisiana. LFPDC faculty visited LSU AgCenter regional offices to make presentations about the Center's activities and how the Center can work together with LCES faculty and staff in the field to promote sustainable forest products industry development in Louisiana. One important part of the LFPDC outreach strategy is the collaborative partnership forged with the LSU AgCenter's Community Economic Development (CED) and Extension Natural Resources (ENR) teams. CED and ENR professionals are located around the state to serve the citizens of Louisiana in urban and rural economic development and natural resources information outreach.

The LFPDC seeks input from stakeholder groups on an annual basis through statewide stakeholder meetings and the LFPDC Advisory Board.

Problems identified as a result of stakeholder input included lack of awareness by both internal and external stakeholders with regard to what the LFPDC does and the overall untapped potential of the forest products sector to further contribute to Louisiana's economy.

#### **Program Impact**

- Area agents, parish chairs and regional managers participated in LFPDC awareness forums held in the Northwest, North Central, Central, Southwest, and Crescent regions of the LSU AgCenter.
- The LFPDC director made 24 forest-sector development related presentations across Louisiana at workshops, association meetings, AgCenter regions, and to legislators.
- The Director also participated in regional expositions where over 1,200 elementary students learned about the importance of forest products to society and forest stewardship.

#### **Source of Funds**

Renewable Resources Extension Act (RREA) and state funds.

## **Scope of Impact**

Multi-state: None

Multi-function: The Louisiana Forest Products Development Center is a totally integrated research-extension activity. The dollar equivalent of multi-function work is \$16,027 (.2 FTE x \$80,136 per FTE x 1.0).

## **Federal Goal 4**

### **MASTER WILDLIFER**

**Key Theme: Wildlife Management**

**Don Reed, Associate Professor, Idlewild Research Station, LSU AgCenter**

#### **Program Description**

Master Wildlifer was a seven-week short course program broadcast via satellite to sites across the southeastern United States. The broadcast originated from Clemson University. The goal of the program was to provide forest landowners and wildlife enthusiasts with basic and advanced information and education regarding proper management of wildlife on private lands, management for threatened and endangered species and conservation considerations.

Because this is a regional program, advisory committees were established both at the regional level and at the local level within each state. During the original Master Tree Farmer program, evaluation instruments were completed by participants. These evaluation instruments not only queried participants about the value of the current program but also asked them what they would like to see in followup programs. Based on their input, the Master Wildlifer program was developed with topic areas designed from stakeholder input.

Some of the issues identified by participants in Master Tree Farmer were: more education regarding management of diverse species on private lands; how to manage for endangered species; how to manage for migratory songbirds; and how to control nuisance wildlife problems. These issues were addressed in the Master Wildlifer Program.

The program was initiated in February 2003 and completed in March 2003. In Louisiana, nine sites carried the program. It was a seven-week program, meeting each week on Tuesday night. A total of 63 meetings were held. Mass media were used to advertise the program and the program itself was delivered using satellite technology.

We collaborated with the following groups in producing the Master Wildlifer workshop series: Louisiana Department of Agriculture and Forestry, Louisiana Department of Wildlife and Fisheries, Natural Resources Conservation Service, Louisiana Forestry Association, Society of

American Foresters, Feliciana Forestry Association, Red Stick Forestry Association, Natchitoches Parish Forestry Association, Northeast Louisiana Forestry Association, Mississippi State University, Texas A&M University, University of Arkansas, Oklahoma State University, Auburn University, University of Tennessee, University of Georgia, University of Florida, Clemson University, University of Kentucky, Virginia Tech University.

### **Program Impact**

Based on information received for similar programs, the overwhelming majority of participants felt the information presented would help them save and earn more money from wildlife enterprises. There were 219 participants in the seven-week program. Based on prior information we expect them to save approximately \$19,947 per person or a total of \$4,368,393. Respondents also stated they expected to earn an additional \$42,827 per person, or \$9,379,113 in total. Approximately 90% of respondents said they expected to make changes in their management practices based on what they learned from the workshops.

### **Source of Funds**

Renewable Resources Extension Act (RREA) funds.

### **Scope of Impact**

Multi-state: States involved in planning, participation, preparation, and sharing of educational materials were: Texas, Oklahoma, Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia. This program was a fully representative multi-state activity. A total of 2.41 FTEs were expended on the program. The dollar equivalent of multi-state work was \$193,128 (2.41 FTEs x \$80,136 per FTE x 1.0).

Multi-function: The program was the result of a totally integrated research-extension effort. The dollar equivalent of multi-function work was \$193,128 (2.41 FTEs x \$80,136 per FTE x 1.0).

### **Federal Goal 4**

#### **NATURAL RESOURCES AND ENVIRONMENTAL EDUCATION (4-H YOUTH)**

#### **Key Theme: Environmental Education**

**Michele Abington-Cooper, Assistant Professor (Youth Environmental Programs and Collegiate 4-H), 4-H Youth Development Department, LSU AgCenter**

### **Program Description**

The 4-H Wild Woods Wanderings Environmental Program was developed to expose 4-H teens to the characteristics of bottomland hardwood forested wetland ecosystems and the challenges

related to their management within an agriculture based economy. The curriculum for the camp was developed by an Advisory Committee of professionals from agencies and associations involved with funding, managing, and conducting the camps: the LSU AgCenter; U.S. Fish & Wildlife; NRCS/Northeast Delta R.C.&D.; Louisiana Department of Parks, Recreation and Tourism and the Tensas River Refuge Association. The camps, which draw 4-H members and volunteers from throughout Louisiana, were initiated in 1995.

Two sessions of this camp were held in the summer of 2003, reaching 46 4-H teens, 8 LSU interns, 7 adult volunteers, and 2 4-H agents. The camp was held at the Poverty Point State Commemorative Area near Epps, Louisiana, which is one of the most important archaeological sites in the United States, and on the Tensas River National Wildlife Refuge. At the beginning of the six-day camping session, participants take a pre-test and are also given a real-life public policy issue to solve: "The reduction of flooding of agriculture lands from the Tensas River in Madison Parish." Throughout the camping session, participants study: how man has utilized the lands in what is now northeast Louisiana from as far back as 4000 years, water quality, soil science, wildlife and hardwood forest management, row crop agriculture and the environment; stream monitoring and management. These lessons are taught by extension specialists and researchers of the LSU AgCenter, U.S. Fish & Wildlife, Louisiana Department of Environmental Quality, Poverty Point State Commemorative Area, LSU interns, and 4-H volunteers from both Louisiana and Mississippi. Peer teaching of 4-H members is also used as groups of member participants prepare a lesson to teach the rest of the participants. Each lesson is designed to build upon the previous one and hands-on participation is encouraged. The lessons, as well as newsletters received by campers each day of the camp, are also designed to give participants the information/knowledge needed to solve a public policy issue. Each group of campers presents its "plan" at a mock meeting of the Madison Parish governing body (Police Jury). The next morning these plans are critiqued and campers learn how the Tensas River Basin Commission is actually addressing this issue. Campers take a post-test and complete an evaluation of the camp before leaving for home.

### **Program Impact**

Campers in 2003 showed an average 14% increase in knowledge gained during the camp. On a scale of 1-5, all activities were rated 3.0 or above with an average score of 4.3. Throughout the years of conducting this camp, 4-H agents, volunteers, and campers have reported a significant increase in student science and math scores, career changes, and greater environmental awareness after attending Wild Woods Wanderings.

### **Source of Funds**

EPA 319 funds channeled through the Louisiana Department of Environmental Quality and Northeast Delta R.C. & D. as well as Smith Lever funds.

## Scope of Impact

Multi-state: One specialist and one 4-H agent for both camps full-time as well as two 4-H agents who attended for one week each. In addition, another 4-H agent utilized about three days preparing and delivering the daily newsletters. Two U.S. Fish & Wildlife agents participated in both camps, one full-time and one half-time. Five LDEQ scientists participated for a half-day each, a NRCS Soil scientist for a half-day, and two professionals from Poverty Point for a day and a half each. Two 4-H volunteers from Mississippi and Louisiana attended both camps full-time. The Advisory Committee met three times during 2003. Planning and preparation time for the two 4-H professionals and U.S. Fish & Wildlife was 12 days each. Planning time for other agency personnel averaged 4 hours each. 30% of one state FTE, 15% of 2 parish FTEs and 10% of 20 parish FTEs of programming in this area are a direct result of collaborative efforts between Louisiana 4-H, national, and multi-state cooperative efforts. The dollar equivalent of multi-state work is \$208,353 (1 FTE x \$80,136 per FTE x .30) plus (2FTEs x \$80,136 per FTE x .15) plus (20 FTE x \$80,136 x .10).

## Federal Goal 4

### POULTRY

**Key theme: Agricultural Waste Management**

**Theresia K. Lavergne, Assistant Professor, Poultry, LSU AgCenter**

### Program Description

In meetings with poultry stakeholders, problems with broiler litter management, EPA regulations, and general management practices were identified. Also, various problems in the processing portion of the industry have been identified during meetings with complex managers. Relations with the state regulatory agencies and integrators have been developed. Meetings and farm visits with producers were conducted to familiarize producers with Poultry Best Management Practices (BMP), Comprehensive Nutrient Management Plans, EPA proposed regulations and Total Maximum Daily Loads (TMDL), and the Phosphorus Index. The Louisiana Department of Environmental Quality, Natural Resources Conservation Service, Louisiana Department of Agriculture and Forestry, Louisiana Farm Bureau Federation, and the LSU AgCenter were involved as speakers and supporters of these producer meetings.

Additionally, in light of the acts of terrorism towards the United States and the outbreaks of Exotic Newcastle Disease and Avian Influenza in the United States, the need for poultry farm biosecurity education was identified by the LSU AgCenter and poultry stakeholders. Thus, poultry producers and poultry integrators were familiarized with biosecurity practices and biosecurity plans. The Louisiana Department of Agriculture and Forestry, the USDA, and the LSU AgCenter were involved.



On-farm demonstrations of in-house broiler litter pasteurization have been initiated and are continuing to be conducted. Methods of pasteurizing broiler litter for reuse, within broiler houses, are being developed. The required litter moisture and temperature necessary for optimum pathogen reduction is being evaluated. Pilgrim's Pride/ConAgra Poultry Company, House of Raeford, and the LSU AgCenter are involved in these demonstrations.

Also, the method of in-vessel poultry mortality composting was evaluated by the LSU AgCenter and The Louisiana Department of Agriculture and Forestry. This method has been approved by the Louisiana Livestock Sanitary Board.

### **Program Impact**

Producers are improving their waste management and dead bird disposal practices. Producers are improving their awareness of EPA regulations, TMDLs, and poultry BMPs. Producers are obtaining analyses of soil and litter samples in preparation for writing Comprehensive Nutrient Management Plans. The NRCS is receiving increased inquiries for nutrient management plans by producers. Producers are improving overall management practices.

Producers are aware of biosecurity practices and are beginning to ensure that biosecurity programs are implemented on their farms.

### **Source of Funds**

State Federal (Smith Lever 3 b, c)

### **Scope of Impact**

Some of the ideas and material for these programs are the result of attendance at the International Poultry Exposition held in Atlanta, GA; The National Poultry Waste Management Symposium in Birmingham, AL; and the Annual Meeting of W195 (Water Quality Issues in Poultry Production and Processing) in Ocean City, MD.

Multi-state: Forty percent of the poultry program is a result of these meetings and materials, the dollar equivalent is \$45,517 (1.42 FTEs x \$80,136 per FTE x .40)

Multi-function: Researchers and extension specialists collaborated on the development and training of agents and producers for a 100% multi-functional effort. The dollar equivalent of multi-function work is \$113,793 (1.42 FTE x \$80,136 per FTE x 1.0).

## **Federal Goal 4**

### **SUGARCANE BURN MANAGEMENT**

#### **Key Theme: Air Quality**

**Benjamin L. Legendre, Professor, (Sugarcane Specialist), South Central Region, LSU AgCenter**

#### **Program Description**

In recent years, agricultural burning policy recommendations were prepared by the U.S. Department of Agriculture (USDA) Agricultural Air Quality Talk Force to help farmers implement provisions of the Clean Air Act while retaining the valid use of fire as a management tool. Task force members included representation from agricultural producers, air quality researchers, agricultural industry representatives, medical researchers, and state air quality and USDA staff. The policy addresses two goals: 1) to allow the use of fire as an accepted management practice, consistent with good science, to maintain agricultural production on agricultural land, and 2) to protect public health and welfare by mitigating the effects of air pollution emissions on air quality and visibility.

The Louisiana sugarcane industry has been proactive in its efforts to improve air quality by developing the Certified Prescribed Burn Manager Program, which is administered by the Louisiana Department of Agriculture and Forestry (LDAF). The LDAF, the American Sugar Cane League (ASCL)(sugarcane commodity group based at Thibodaux, LA) and the LSU Agricultural Center developed a training curriculum entitled, "Louisiana Smoke Management Guidelines for Sugarcane Harvesting." Although the training is voluntary, over 1,400 sugarcane producers and their employees have attended training sessions since 2000, representing over 99% of the sugarcane farming entities in the state. Furthermore, the LSU Agricultural Center and the ASCL provided additional educational materials regarding sugarcane burning for distribution to the general public through the printed media as well as TV and radio. Extension agents received additional training from specialists and, in turn, conducted training at sugarcane field days in most of the cane growing parishes (counties).

The LSU Agricultural Center is cooperating with other agencies, namely the ASCL and the USDA's Agricultural Research Service, to develop economically feasible alternatives to agricultural burning to include developing sugarcane varieties that shed their leaves, mechanical and biological removal of residue following green cane harvest, use of conservation tillage, and developing value-added products from the crop's residue. An effective residue management program that reduces nutrient runoff could have a positive impact on both water quality and air quality since there would be no need to burn the extraneous material before harvest or the residue after harvest. Other research initiatives have shown that the residue left on the field following green cane harvesting may help suppress weeds and offer some freeze protection during the winter months although most data have shown a reduction in yield in the subsequent stubble

(ratoon) crop of 4 to 5 tons per acre if the residue is not removed. Other research has tested biological agents that could be used to speed up decomposition of the residue further reducing the need to burn.

Collaborators in developing protocol and policy with regard to burn management that help to support the effort include the Florida Sugar Cane League, the Rio Grande Valley Sugar Growers, Inc., USDA-NRCS, Louisiana Department of Environmental Quality, Environmental Protection Agency, the USDA Forest Service, and the National Weather Service.

### **Program Impact**

Louisiana is not the only state, nor is sugar production the only industry, facing the challenges posed by burning as an agricultural management tool. Every industry that uses burning recognizes that a cost-effective mechanism for reducing or eliminating open field burning is a high priority research topic. A total of 1,410 producers and/or their representatives have attended the Certified Prescribed Burn Manager Program training sessions since 2000. Furthermore, as many as 2,000 producers and/or their representatives attended the field day presentations during the summer of 2003 where additional training on smoke management was given. It appears that the overall training programs have continued to work exceptionally well with the number of complaints by the general public steadily declining to less than five during the 2003 harvest. The LDAF and ASCL continued to follow up all complaints with a letter to the growers cited for improper activities with regard to their burning practices.

Since 2000, numerous studies have been completed in an attempt to improve the efficiency of harvesting operations without the need to burn. During the 2003 harvest season it is estimated that over 70% of the crop was harvested green. As a result of this program the Louisiana sugarcane industry has received excellent feedback from the communities on their attempt to improve air quality for all its citizens.

### **Source of Funds**

Federal Funds (Smith -Lever 3 b, c)

### **Scope of Impact**

Multi-state: Although this program on sugarcane burn management was established for Louisiana, the sugarcane industries of Florida and Texas have requested various educational materials that have been shared with research and extension personnel in these states for possible distribution to their producers.

Multi-function: Multi-function (integrated research-extension) efforts are estimated at 15% of the total number of FTEs expended in the program. These efforts include research-extension collaboration in agent training, formulations of recommendations, publications, and field visits during the sugarcane harvesting period. The dollar value of this multi-function effort = [.15

(estimated % of program) x 2.5 (FTEs devoted to sugarcane burn management program) x \$80,136 (\$ equivalent of 1 Extension professional FTE)] = \$30,051.

#### **Federal Goal 4**

#### **UNDERSERVED FOREST LANDOWNER OUTREACH**

**Key Theme: Natural Resources Management.**

**Mike Dunn, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

In FY 2003, a multi-state, multi-function program was developed as a vehicle for outreach to traditionally underserved forest landowners. This effort was spearheaded by Mississippi State and Louisiana State University. The target audience was all forest landowners, regardless of race, sex, or age, who were under-represented or underserved in Louisiana Cooperative Extension Service forest management – related education and outreach programs in the past. However, special emphasis was placed on those demographic groups most underserved on an historical basis, including African American women and men, and Caucasian women. These groups represent significant landholdings in Louisiana; therefore, educating these groups regarding opportunities for good, proper, sustainable forest management leads to more income for these groups as well as sustainable economic development for Louisiana. The outreach techniques used for these workshops are unprecedented in the history of forest landowner extension/outreach in Louisiana.

The following steps were observed to get stakeholder input:

*Step 1:* We conducted focus group sessions in each of the four representative areas of Louisiana. The focus groups were designed to be representative of underserved landowners in the area. An external facilitator (someone not affiliated with the LSU AgCenter) conducted the focus group sessions in order to insure there was no bias introduced into the sessions. The focus groups discussed possible problems in the past that had led to poor participation by underserved forest landowners and how that may be avoided in future workshops. Furthermore, discussion was conducted regarding potential questions that might be asked of underserved forest landowners if a survey were conducted.

*Step 2:* We conducted a random sample of forest landowners in 20 Louisiana parishes. Questions were asked that represented feedback solicited from the focus groups plus generic demographic information. The main purpose of the survey was to examine differences between focus group responses of underserved forest landowners versus responses made by randomly selected forest landowners to see if there were any potential challenges to overcome in conducting underserved forest landowner workshops. For example, we were concerned

regarding location of the workshops. If we had historically held workshops in non-neutral or unfriendly locations for underserved forest landowners because we had solicited input from fully served forest landowners, then we ran the risk of failure by not obtaining that information from the outset.

*Step 3:* We organized local advisory committees responsible for assisting the agents with workshop coordination and implementation. The local advisory committees for the most part represented leadership among the underserved communities. They provided invaluable insight into how and where to hold meetings. Furthermore, it was deemed very important to solicit local speakers to the extent possible to speak to workshop participants, especially when those speakers would be representative of the underserved audience.

*Step 4:* The workshops were held in accordance with all input we had garnered through the first three steps of this process.

Problems identified included basic forest management information, legal aspects of forestland, complications arising from many owners of small properties, and timber marketing.

In FY 2003 four workshops were held for underserved groups using the information generated from stakeholder input. Plans are to continue these programs indefinitely.

### **Program Impact**

Evaluation results from the workshops indicate that 51% of the audience fell into the category of traditionally underserved (non-white males). A total of 346 landowners attended the four workshops. Their self-assessed value of the information to survey respondents (a total of 184 landowners or 53%) was estimated at \$2,498,000, or \$13,576 per landowner. Respondents reported owning 18,814 acres, or approximately 102 acres per landowner. Furthermore, 48.5% of respondents indicated they had used a forester in the past, and 88% indicated they would use a forester in the future as a result of what they learned at the workshops. In addition, only 22% of respondents indicated they currently had a written management plan, but 85% expected to obtain a written forest management plan for their land as a result of what they learned at the workshops. Given the unprecedented success of these programs at establishing relationships with heretofore unknown and underserved clientele, plans are to continue to conduct these workshops in the future. A follow-up survey conducted in northwest Louisiana three months after the underserved landowner workshop in that area revealed that 67% of the participants had adopted management practices as a result of the program.

### **Source of Funds**

Renewable Resources Extension Act (RREA) funds and USDA grant funds.

## **Scope of Impact**

Multi-state/Multi-function: A total of 2.5 FTEs was expended on this program. The program was the result of a total multi-state and multi-function effort. Therefore, the dollar equivalent for each type of work, multi-state and multi-function, was \$200,340 (2.5 FTEs x \$80,136 per FTE x 1.0).

## **Federal Goal 4**

### **WATER QUALITY**

#### **Key Theme: Water Quality**

**Mike Liffman, Team Leader, Watershed Education, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

Louisiana has been in a prolonged near-drought condition, and although rainfall returned in 2003, considerable more rain is needed before weather patterns return to normal. Nevertheless, the rainfall helped improve the overall quality of surface waters as accumulated materials were partially flushed from streams and stream water flows now approach normal historic levels. Aquifer recharge is also on the rise thus improving the quality of ground water by reducing the infiltration of salt water into the aquifers. Nevertheless, efforts to use surface water sources need to be intensified, because the consumption of high volumes of groundwater is depleting several critical aquifers. Water levels in the Sparta, Chicot and Southern Hills aquifer systems have been declining at rates greater than 1 foot a year.

Louisiana has an abundance of surface water within 12 major watersheds or river basins, that are in turn composed of several hundred smaller sub-watersheds. Unfortunately, 350 stream segments have been listed as "impaired streams" and many of the state's lakes are considered to be impaired for one or more of their designated uses. The recent implementation of the Total Maximum Daily Load (TMDL) portion of the Clean Water Act resulted in the development of 153 TMDLs by EPA and Louisiana's Department of Environmental Quality.

The aforementioned conditions and situation served as a major impetus for the LSU AgCenter's establishment of a watershed education initiative in 2001. This multi-dimensional effort provides diverse audiences with science-based information concerning water quality challenges and solutions. Six watershed educators have as their primary charge the delivery of education programs on nonpoint water quality issues, and they do so in six of the state's 12 major watersheds. Since the outset, the educators have devoted a great amount of time to conveying information to numerous audiences within these watersheds on how watersheds function and how water and pollutants move through them. A focused educational approach is used that targets specific priority areas and groups within the watersheds. Several audiences were deemed

priorities, notably agricultural and aquacultural producers, marinas and recreational boaters, municipal and parish officials and planners, business and industry, rural and urban residents, and youth.

An emerging issue that will require considerable attention in the future is the EPA Phase II storm water regulations that require that 24 Louisiana towns and cities and 14 parishes (counties) will need to develop storm water permits. In addition, operators of small construction sites—one to five acres— including roads and highways, develop and implement storm water management plans. This will require significant local government management and oversight changes. Eventually, many more towns and parishes will be affected by the implementation of the TMDLs when the program reaches that phase. Workshops and other educational forums will be provided and written materials in the form of Guidebooks will be provided to those attending the meetings.

### **Program Impact**

Environmental stewardship has been the theme at 4-H and environmental camps, weekend sessions, special events, and club meetings that reached 8,000 youth. Special summer programs such as “Wild Woods Wandering” in the Tensas River Basin, “Marsh Maneuvers” in coastal Louisiana, and “4-H Summer Camp” in the lower Red River near Pollock have provided in-depth water quality education to future leaders from throughout the state. Less intensive but awareness-building sessions like Earth Day, State Fair and other sessions where water education is conducted with the Ground Water Model and Enviroscope are good introductory experiences for both youth and many adults. Water well protection and testing programs continue to provide information to private well owners and homeowners/householders through Farm\*A\*Syst and Home\*A\*Syst.

Water quality education and protection by agricultural producers has been incorporated into the Louisiana Master Farmer Program. The training involves completing three phases: (1) classroom instruction on environmental stewardship related to water quality regulations, conservation practices, and USDA conservation funding; (2) attendance at Model Farm Field Days, which include on-farm viewing of implemented, commodity-specific conservation practices; and (3) development of farm-specific conservation plans. The program has enrolled 1,300 producers in the first four watersheds, and is conducted in conjunction with the USDA-NRCS, Louisiana Department of Environmental Quality, the Louisiana Department of Natural Resources, the Louisiana Department of Agriculture and Forestry, the Louisiana Association of Conservation Districts, the Louisiana Farm Bureau Federation, and the Louisiana Cattlemen’s Association.

Education on pesticide safety, handling, and use was provided to producers in order for them to obtain their pesticide certification license. Sprayer calibrations and spray plane fly-ins provided additional water protection by making sure that ground application equipment and spray planes were working properly. Training sessions were conducted on proper use, timing, and selection of herbicides to minimize the introduction of the materials in surface waters. Nutrient management demonstrations were conducted for 120 poultry producers to provide information on litter

testing, soil testing techniques, and applicator calibration to prevent ground or surface water degradation from litter applications.

Watershed educators also work closely with the LSU AgCenter's Experiment Station, the Callegari Center, and other researchers on projects to help verify the effectiveness of certain agricultural best management practices. A current project in the Mermentau Basin will evaluate the quality of the water that is discharged from rice fields that use newer management techniques, such as no-till drill seed planting and maintenance, versus the traditional rice planting and maintenance that is often referred to as "mudding in."

Municipal and parish governments are also a very important audience for watershed educators. Geographic Information System (GIS) technology is being used in the Calcasieu River and Vermilion-Teche river basins to advise local governments regarding urban land use effects on water quality, and how agricultural and aquacultural land use practices can help reduce pollutant inputs. Two watershed educators are implementing a Louisiana NEMO program, an acronym for the Nonpoint Education for Municipal Officials program that was established at the University of Connecticut in the early 1990s. A workshop was conducted to assist municipal and parish (county) officials in preparing their Phase II Storm Water Permits that was attended by 4-H local officials and consultants. A CD with information and a workbook was provided to all attendees.

Nine faculty members attended the four-day Southern Regional Water Quality Conference in Ruidoso, NM. This biannual forum, along with CSREES' annual meeting of water quality researchers and extension faculty, enable the participants to share and learn of outstanding projects in other states and to network with colleagues from other southern states and national experts.

### **Source of Funds**

Funds were obtained from Smith-Lever, state sources, USDA-CREES 406 grant, Sea Grant, and EPA Section 319 funds.

### **Scope of Impact**

Multi-state efforts are 40% of one FTE on the Regional 406 USDA-CREES grant in addition to .5 FTE of other activities and education programs supported by the grant. Over 1.25 FTE are supported by the EPA Section 319 grant which is a multi-function and multi-state (research-demonstration) project. The dollar amount of multi-state work is \$ 465,590 based on 5.81 FTEs at \$80,136 and the value of the multi-function work is \$100,170 based on 1.25 FTEs at \$80,136.



## **Federal Goal 4**

### **WATER RESOURCES DEVELOPMENT**

#### **Key Theme: Natural Resources Management**

**Bill Branch, Professor, Department of Biological and Agricultural Engineering, LSU AgCenter**

#### **Program Description**

The 2003 crop year provided a rare combination of good weather and good prices for commodities which was welcomed after two years of low prices and reduced yields due to wet weather at harvest. This respite has renewed interest in improving water use efficiencies through adoption of new technologies to reduce input costs and improve yields. Many growers and community leaders are increasingly interested in developing surface water resources to replace current ground water use.

Irrigation research is being conducted at six research stations and on private land. Community leaders are trying to develop recreation and home-building sites near lakes and reservoirs as an economic development tool. The sediment and nutrients in surface water are being increasingly valued for its ability to restore and slow down the loss of coastal wetlands. An increased surface water flow rate in bayous and streams is seen as a means to improve water quality and fish habitat. The Water Resources Development program provides assistance in learning which agencies can provide assistance with large water resource development projects, bringing agencies and users together, and making the contacts needed to get projects started. Research and demonstration of water conserving technologies is key to the program.

Problems identified include: the years and millions of dollars required for large scale surface water projects and the need to guide users through the process of permits, regulations, financing, and public relations; the availability of water of suitable quality; the returns to investment in irrigation; the applicability of available irrigation systems to specific farm operations; and the timing of irrigation on row crops.

County agents have included drainage and irrigation on the agenda as part of their annual parish programs. Presentations include new technology as well as proven practices appropriate to farmers, consultants, agents and agency staff, and to the crops, topography, soils, and land tenure predominant in the parishes. Types and costs of irrigation systems, expected returns from irrigation, maintenance and operation requirements, and applicability to various soil types were discussed. Several dozen growers have been introduced to irrigation scheduling. Research on micro and furrow irrigation of sweet potatoes, furrow irrigation of cotton, corn, sorghum and soybeans, level-basin and border irrigation of soybeans, sub-surface drip irrigation of cotton, drip-fertigation of strawberries, and water use for rice is continuing. Southwest Louisiana rice growers are increasing use of rice varieties and land leveling techniques which may allow

reduced water use. Training has been provided to Master Gardener and landscape contractor classes. Availability and quality of ground and surface water has been a part of presentations in many parishes. Progress continues on the Red Bayou Project which will allow use of Red River water to irrigate about 14,000 acres. The Tensas Basin Recon study has been completed with a recommendation for a feasibility study to begin in May, 2004. Potential results include increased surface water availability between the Ouachita and Mississippi Rivers. Preliminary work has been done in planning for new lakes in Allen, Bienville, Caldwell, Claiborne, Franklin, Jackson, Madison, Morehouse, Ouachita, Washington and Webster parishes. The Ground Water Management Commission and Task Force have been reauthorized by the Legislature. The Mississippi River diversion project at Lake Maurepas continues to move forward with little opposition.

Cooperative studies with the US Geological Survey were completed on Red River water quality and ground water levels and quality in the Chicot Aquifer and the Mississippi River Alluvial Aquifer in Franklin Parish.

### **Program Impact**

Farmers in many parishes have a better understanding of the amount of water available from existing systems and how to best utilize the water resulting in increased crop yields and more efficient irrigation. A dozen farmers have adopted and continue to use border irrigation for drilled soybeans in precision-graded fields and another dozen farmers have adopted and continue to use side-inlet irrigation for rice. A few rice farmers have adopted zero-grade and are learning how to use it for both rice and soybeans. Rice farmers are beginning to understand how much water they are using and what it costs after two years of data collection. Some have installed tail water recovery systems. County agents have provided irrigation scheduling for two dozen farmers resulting in yield increases, but none have adopted the technique for their own use. Growers continue to learn how important it is to determine salt content of the ground water before using it on a crop by taking advantage of the irrigation water testing program. The Caddo Soil and Water Conservation District has formed an irrigation district and a proposal for funds to support a surface water irrigation demonstration watershed project through USDA has been requested by a Member of Congress.

Numerous land owners and community leaders have learned how to work with the Corps, NRCS and DOTD to develop water resources. The results of these programs include: enhancement of crop yields; insurance against crop losses in dry years; decreased dependence on ground water; increased surface water availability for recreation, public water supply, business and industry; improved surface water quality and habitat during summer months; and nourishment of marsh in coastal parishes. Permanent legislation has been enacted for ground water management.

Concerns about declining water levels and quality in the Chicot and Mississippi River Alluvial Aquifers have been allayed as preliminary results of two USGS studies have been received and communicated to farmers and policy makers. Final reports are expected in 2004. Concerns about

water quality of Red River water have been reduced because of analyses of USGS data and several projects conducted by faculty and NRCS staff.

#### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)  
Red River Waterway Commission  
Louisiana Rice Research Board  
Louisiana Department of Transportation and Development  
Louisiana Legislature

#### **Scope of Impact**

The surface water development, irrigation and drainage education programs were dependent on assistance from other states, especially Arkansas, Mississippi, Missouri and Texas. Research and extension faculty collaborated on development and implementation of the irrigation and drainage program.

Multi-state: The surface water development education program may have some impact on similar programs in other states in future years. Half of Louisiana's program is based on experience in Arkansas, Mississippi, Missouri and Texas. The dollar equivalent of multi-state work is estimated at \$80,136 (.5 x 2 FTEs x \$80,136).

Multi-function: At least 50% of the information used in these programs has come to us from extension and research faculty in other states and from federal and state agency staff in Louisiana, Arkansas, Arizona and Mississippi. The value of multi-function work is \$80,136 (.5 x 2 FTEs x \$80,136).

#### **Federal Goal 4**

### **WOOD PRODUCTS OUTREACH**

#### **Key Theme: Forest Crops**

**Todd Shupe, Associate Professor, School of Renewable and Natural Resources, LSU  
AgCenter**

#### **Program Description**

Wood products specialists work with area and county agents, state and federal agencies, and other natural resource stakeholder groups to disseminate important information related to the production and marketing of wood products, as well as providing information to homeowners regarding wood-related issues and to hobbyists engaged in the production of finished wood products or crafts.

Input is received from field agents and other groups pertaining to wood products issues. In addition, the LSU AgCenter Forest Products Development Center (FPDC) holds an annual stakeholder input session. Much of the input related to extension and outreach in the area of wood products is gathered through the FPDC. Specialists gather all input data and consider which programs to implement based on this stakeholder input.

Problems identified included lumber drying, business management, and marketing.

This is an ongoing program and serves as an integral component of all natural resource-related extension/outreach activities.

### **Program Impact**

More than 3,000 people received wood products education information by either attending workshops, receiving a quarterly newsletter, on-site visits, email or telephone correspondence. In FY 2003, approximately 3,000 people visited the Extension Natural Resources web site to gain information. The Louisiana Dry Kiln Club Newsletter is issued quarterly to an international database of over 1,000 recipients. The average value of the FY 2003 workshops and presentations to the individuals who attended was \$10,000. Approximately two-thirds of the participants are planning business expansions either for hiring additional employees or acquiring additional equipment and/or facilities.

### **Source of Funds**

Renewable Resources Extension Act (RREA), Hatch, and state funds.

### **Scope of Impact**

Multi-state: A total of .4 FTE was devoted to the wood products outreach program. It is estimated that 15% of the program was the result of multi-state activities. The dollar equivalent of multi-state work is \$4,808 (.4 FTE x \$80,136 per FTE x .15).

Multi-function: The wood products outreach program is a totally integrated research-extension effort. The dollar equivalent of multi-function work is \$32,054 (.4 FTE x \$80,136 per FTE x 1.0).

## **Federal Goal 4**

### **WETLAND AND COASTAL RESOURCES**

#### **Key Theme: Wetland and Coastal Resources**

**Rex H. Caffey, Associate Professor (Wetland and Coastal Resources), Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

##### *Background*

A variety of groups, including farmers, fishermen, recreational interests, conservation groups, and the offshore mineral industry, are in intense competition for limited coastal and wetland resources, a situation exacerbated by wetland losses of over 20,000 acres per year. Most coastal residents and users are aware that major environmental changes are occurring, but there is a general lack of agreement on acceptable solutions, which must be based on a thorough understanding of tradeoffs and consequences in order to result in consensus and collective action. The links among wetland habitats, sustainable natural productivity, and human needs must be clearly understood. Extension and research programs in this area focus on identifying and describing these links.

A specialist position in Wetland and Coastal Resources has existed within the LSU AgCenter since 1992. However, the programmatic efforts supported by the position were combined into a Coastal Enhancement Team in 2001. The purpose of the team is to address a wide range of issues of concern regarding wetland and coastal resources in the Louisiana Coastal Zone.

The challenge facing this enhancement team is to identify and objectively assess controversial issues facing coastal constituents. Specific problems exist due to the public's general lack of appreciation for functions and values of the coastal landscape. Where such appreciation does exist, there are additional constraints regarding the efficacy of resource management/restoration policies and strategies. While dollar-implications are the currency of expression for most policy-makers and stakeholders, lack of economic linkage research has limited the team's teaching capacity in this area.

##### *Stakeholder Input*

At the beginning of FY 2003, the coastal team began to refine its extension efforts to provide increased delivery of on-line extension materials and to increase focus on the financial implications of wetland and coastal resource policy. These refinement objectives were the result of a constituent survey conducted during FY 2002. In that survey, stakeholders demanded increased visibility and additional capacity in the area of natural resource policy interpretation.

##### *Problems Identified*

Louisiana has seen a steady expansion in public funding for natural resource management, especially in the areas of coastal restoration and farm-based conservation. The wise use of this

funding requires a coordinated resource economics program that contributes to the policy making process. As more ambitious plans for conservation and restoration unfold, economists will increasingly be called on for their expertise in non-market valuation, property rights and public goods, resource allocation, and compensation analysis. While some of this research has occurred in Louisiana, efforts have been fragmented and widely dispersed across different research units and campuses. To date, most resource management information generated for the public has been biophysical, and comparatively little attention has been given to the socioeconomic analysis of Louisiana's natural resources.

#### *Initiation and Progress of the Program*

When extension was integrated into the Department of Agricultural Economics and Agribusiness (DAEA) in January 2000, research and extension economists formed an exploratory committee to evaluate the possibility of a research and extension-based center that could provide much-needed socioeconomic assessments of Louisiana's various natural resources. During FY 2003 the Center for Natural Resource Economics and Policy (CNREP) was formed and approved by the LSU Board of Supervisors and Louisiana Board of Regents. In the past year, CNREP has grown to include 12 members, including six faculty from within the DAEA and four economists from other affiliated social sciences, and two legal faculty from the Sea Grant Legal Program. Over the past year, CNREP has begun to accelerate its pursuit of short-term (sponsored grants) and long-term (institutional, foundation) funding to support resource and environmental economics programs. In the Spring of 2003, CNREP produced a compendium of member productivity spanning the past five years. Official approval of CNREP by the LSU Board of Supervisors was granted in December 2003, and Board of Regents Approval was granted in January 2004. Over the past 5 years, CNREP members have produced more than 300 research and extension publications, 225 professional presentations, and obtained more than \$2.7 million in 43 extramural funding awards. On May 27th and 28th, 2004 the center will host an national conference at LSU entitled: "The Status and Challenges of Socioeconomic Research in Coastal Systems: Valuation, Analysis, and Policy Development" <http://www.agecon.lsu.edu/CNREP/>

The Coastal Enhancement team and CNREP continue to work with local, state, and federal governments, NGO's, and individual citizens on a variety of programs and projects. The primary focus of the work in wetland restoration with adult and youth audiences pertained to wetland functions and values, wetland delineation, wetland plant materials, hypoxia/water quality, fisheries ingress and egress in coastal wetland hydrologic units, and fisheries impacts of fresh water diversions. At the youth level, these efforts were primarily represented by 60 days of planning, implementation, and evaluation related to the Marsh Maneuvers Program. Specific accomplishments from FY 2003 are listed below:

The main accomplishment of the Coastal Enhancement Team over the past few years has been the completion of the "Interpretive Topic Series on Coastal Wetland Restoration." This 5-publication series was initiated in May 2000 and completed in August 2003. The topics are:

- 1) Fisheries Implications of Freshwater Reintroductions,
- 2) Mississippi River Quality: Considerations for Coastal Restoration,

- 3) Closing the Mississippi River Gulf Outlet: Economic and Environmental Implications,
- 4) Coastal Louisiana and South Florida: A Comparative Wetland Inventory, and
- 5) Stewardship Incentives for Louisiana's Coastal Landowners.

To date, there have been 9 derivative publications generated from these works, including published abstracts and papers for the Southern Agricultural Economics Association, the Gulf Estuarine Research Society, and the American Water Resources Association. Approximately 27 oral presentations have also been generated from this series and delivered to numerous statewide and national audiences including various civic organizations, National and Louisiana Sea Grant Advisory Councils, the Coastal Wetland Planning, Preservation, and Restoration Act (CWPPRA) Committee, the International Coastal Society, and various civic and academic groups. <http://www.lacoast.gov/reports/its/index.htm>

Louisiana is a state of fishers and fish consumers like no other. As might be expected, a lot of research, writing and education about fisheries and fish resources has been produced over the years. Much of it is still applicable to current questions and issues, especially with respect to the impacts of coastal land loss and the effects of restoration projects. But when you need it, how do you get it? The Coastal Enhancement team worked with Louisiana Sea Grant in 2003 to develop the new website that provides more than 30 years of information on fisheries and wetland conservation. The new SeaGrantFish website was receiving 6,500 visitors monthly by late 2003, just 6 months after it was established. Most recently, the organizers of the website were awarded an Education Excellence Award by the Louisiana Wildlife Federation for their education and outreach efforts: <http://www.seagrantfish.lsu.edu/index.html>

For the 15th year running, the Marsh Maneuvers 4-H coastal education program was successfully held on Grand Terre Island. This wetland educational camping program is a joint effort of the LSU Agricultural Center's Cooperative Extension Service, the Louisiana Department of Wildlife and Fisheries, the Louisiana Sea Grant College Program, and the Barataria-Terrebonne National Estuary Program. Students are involved in a wide range of exciting activities including wetland restoration, marine fisheries sampling, cast netting, sport fishing, crabbing, water quality testing, seafood handling (food safety), nature viewing, and fish and wildlife identification. The Marsh Maneuvers curriculum focuses on coastal ecology, wetland loss, and key social issues affecting the health and economic well being of Louisiana's coastal communities. <http://www.agctr.lsu.edu/Subjects/wetlands/MMcamp.htm>

Earth Day 2003: For the third year running, the Team participated with the LSU AgCenter and La Sea Grant to help coordinate educational displays at the Baton Rouge Earth Day. Each year we co-chair a "Wetlands Tent" that includes numerous educational displays and hands-on exhibits related coastal restoration in Louisiana. Similarly, from 1999-2003, we have participated in "Ocean Commotion" a one day event sponsored at LSU by La Sea Grant that reaches more than 3500 kids each year. <http://lamer.lsu.edu/projects/oceancommotion/>

The Coastal Team has actively participated as principal investigators and coordinators of the Coastal Roots program since 2000. This high school and middle school based wetland nursery program has expanded to 14 volunteer schools across coastal Louisiana since inception in 2000. During 2003, EPA Secretary Christine Todd Whitman visited Louisiana and she took an afternoon to meet with representatives of the Coastal Roots Program. Secretary Whitman was very enthusiastic and supportive of the program.

<http://lamer.lsu.edu/projects/coastalroots/index.htm>

In FY 2003 there was an effort to enhance production and delivery of the quarterly newsletter, Louisiana Wetland News. Topics covered during this reporting period included: Newly proposed wetland legislation, coastal restoration funding mechanisms, economic impacts of tropical storms, proposed changes to the Clean Water Act, the Supreme Court's SWANCC ruling, the Rise and Fall of Agricultural Wetlands, oystermen lawsuits, and other information. All subscriptions to the newsletter are now completely electronic.

[http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland\\_News/LWN.htm](http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland_News/LWN.htm)

In May 2003, members of CNREP developed and implemented a survey to gauge public support for state acquisition and management of Elmer's Island. Elmer's Island has been a popular destination for coastal recreation in Louisiana for more than 30 years, however, the property was closed in 2001 after the death of the owner and has since been on the market. Through internet and in-person surveying, the coastal team received 2,693 responses to the survey. Preliminary results are being used by the La Division of Administration in their efforts to negotiate a purchase price and operational plan for the property.

<http://www.agecon.lsu.edu/CNREP/ElmersIsland.pdf>

Finally, both the Coastal Team and CNREP have begun to make increased use of the Internet for dissemination of a number of educational slide shows related to wetland and coastal resources. Slide show topics now regularly disseminated online include: wildlife and fisheries values in coastal Louisiana, diversity and value of coastal agriculture, wetland valuation techniques, wetland functions and values, and wetland delineation and policy. A CD Rom with over 25 power-point presentations has been made available to each member of the coastal enhancement team.

In 2003 the national listserv "RestNet" continued to grow and now includes more than 120 coastal and wetland resource educators and resource managers nationwide. The listserv is the communication and outreach arm of the NOAA Coastal Restoration Network that was established in 1999. RestNet is housed by Louisiana State University and maintained by the Louisiana Cooperative Extension Service.

\*The list below contains some of the publications and presentations developed by team members during FY 2003.



Caffey, R.H. (2003) "A Case for Subvention of Private Landowners in the Louisiana Coastal Zone", Selected Paper, Natural Resources and Environment Session, Southern Agricultural Economics Association, AgEcon Search #6871, 20 p.

Caffey, R. H. and M. Schexnayder (2003) "Coastal Louisiana and South Florida: A Comparative Wetland Inventory", in: An Interpretive Topic Series on Louisiana Coastal Wetland Restoration, Coastal Wetland Planning, Preservation, and Restoration Act Outreach Committee (eds.), National Sea Grant Library No. LSU-G-03, 8p.

Caffey, R. H., K. Savoie, and M. Shirley (2003) "Stewardship Incentives for Louisiana's Coastal Landowners" in: An Interpretive Topic Series on Louisiana Coastal Wetland Restoration, Coastal Wetland Planning, Preservation, and Restoration Act Outreach Committee (eds.), National Sea Grant Library No. LSU-G-03, 4p.

Caffey, R.H. Paudel, K., and L. Hall (2003) Elmer's Island Coastal Preference Survey: A Preliminary Report, Center for Natural Resource Economics and Policy, Department of Agricultural Economics and Agribusiness, LSU AgCenter, 105 pp.  
<http://www.agecon.lsu.edu/CNREP/ElmersIsland.pdf>

The Economic and Environmental Significance of Louisiana's Agricultural Wetlands as Waterbird Habitat, submitted with J.V. Huner and J.V. Westra, Society of Wetland Scientists, 24th Annual Meeting, New Orleans, LA June 2003.

Caffey, R.H. 2003. "The Rise and Fall of Louisiana's Agricultural Wetlands?" Louisiana Wetland News: Fall. Department of Agricultural Economics and Agribusiness, Louisiana Cooperative Extension Service, 8 pp.  
[http://www.SeaGrantFish.lsu.edu/pdfs/wetland\\_news/2003/fall\\_03.pdf](http://www.SeaGrantFish.lsu.edu/pdfs/wetland_news/2003/fall_03.pdf)

Caffey, R.H. 2003. "Amendments 1, 2, & 3 Explained", Louisiana Wetland News: Summer. Department of Agricultural Economics and Agribusiness, Louisiana Cooperative Extension Service, 8 pp.  
[http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland\\_News/Summer%202003.pdf](http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland_News/Summer%202003.pdf)

Caffey, R.H. 2003. "New Wetland Bills Introduced to LA Legislature", Louisiana Wetland News: Spring. Department of Agricultural Economics and Agribusiness, Louisiana Cooperative Extension Service, 8 pp.  
[http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland\\_News/Spring%202003.pdf](http://www.agecon-extension.lsu.edu/CaffeyWeb/Wetland_News/Spring%202003.pdf)

"Elmer's Island Coastal Preference Survey: A Preliminary Report" Red Stick Fly Fishing Association, January 13, 2003, Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA.

“Elmer’s Island Coastal Preference Survey: A Preliminary Report” Louisiana Sea Grant Executive Advisory Committee, December 11, 2003, Lod Cook Alumni Center, Baton Rouge, LA.

Panel Moderator: “Ground Zero or Zero Ground: Building Consensus on the Economic Threat,” America’s WETLAND Eco-Eco Summit: The Governor’s Economic Summit on Coastal Erosion, Cox Academic Center, Louisiana State University, October 2003.

Functions, Values, and Delineation of Wetlands, Guest Lecture, Natural Resource and Environmental Policy, School of Renewable Natural Resources, November 22, 2004.

Session Moderator: “Wetland Policy: Section 404 and SWANCC”, Society of Wetland Scientists, 24th Annual Conference, New Orleans, La 2003.

“Stewardship Incentives for Louisiana’s Coastal Wetland Landowners”, Louisiana Coastal Area Comprehensive Study Executive Stakeholder Meeting, August 8, 2003.

“A Case for Subvention of Private Landowners in the Louisiana Coastal Zone” Southern Agricultural Economics Association Annual Meeting, February 3, 2003 Mobile, Alabama

#### *Collaboration*

The Coastal Enhancement Team and CNREP continue to maintain active participation on various committees involved in wetland restoration, including: the Barataria-Terrebonne National Estuary Management Program’s Management Conference, the BTNEP Scientific Advisory Committee, USDA/NRCS State Wetlands Advisory Committee Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Public Outreach Committee and Citizens Participation Group, Extension Education/Electronic Communication Group, and the Sea Grant Marine Extension Project. The team leader has maintained the NOAA Coastal Restoration Network’s Listserve since January of 2000.

#### **Program Impact**

It is difficult to gauge the actual level of learning gained from any extension program. Commodity-based programs deal primarily with a single audience (producers) that may be more easily evaluated regarding technology adoption rates, use of best management practices, etc. However, measuring the assimilation of information by a wide range of stakeholders (e.g. resource managers, fishermen, NGOs, landowners, petroleum industry) is more problematic.

FY 2003 began with a program assessment survey in which our constituents called for an expansion of the personnel and visibility of the wetlands and coastal resources program. At best, the coastal enhancement team can claim that over the past year, the use of the Internet and electronic dissemination techniques has made our extension education materials more visible and effectively expanded the reach and accessibility of our program efforts. Additionally, the development of CNREP bodes well for our ability to provide timely and relevant extension

programs and publications related specifically to the economic aspects of wetland and coastal resource policy.

### **Source of Funds**

Smith-Lever 3 b,c and specific grant funds from The Barataria-Terrebonne National Estuary Program, the La Governor's Office of Coastal Activities, and the Coastal Wetland Planning, Preservation, and Restoration Act.

### **Scope of Impact**

The impact of these activities is primarily limited to the state of Louisiana. However, national collaboration is ongoing through the NOAA Coastal Restoration Listserv and the team maintains regular communication and interactions with sister Sea Grant extension programs in the southeastern U.S. Several of the team's new extension education publications and presentations were provided at regional and national conferences in FY 2003. The team leader works closely with researchers on the LSU campus involved in the biophysical aspects of wetland and coastal research (e.g. engineering, biogeochemistry, agronomy, ecology).

### **Federal Goal 4**

#### **WILDLIFE EXTENSION OUTREACH**

##### **Key Theme: Wildlife Management**

**Mike Dunn, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

##### **Program Description**

Wildlife conservation and management is one of the most important aspects of natural resource management in Louisiana. The LSU AgCenter has one FTE dedicated to developing and implementing wildlife-related extension/outreach programming.

Input is received from field agents and other groups pertaining to wildlife issues. The wildlife specialist also participates in advisory committee meetings around the state. All input received from stakeholders is considered by the wildlife specialist to improve communication and implement outreach strategies.

Problems identified include: nuisance wildlife, wildlife management issues, endangered species issues, and educating youth regarding awareness of wildlife management and its importance.

## **Program Impact**

4-H youth received training in the conservation and management of timber and wildlife resources through the 4-H Wildlife Habitat Evaluation Short Course contest and various other parish programs at refuges and wildlife management areas throughout the state. The conservation and management of bats, training in life skills through the 4-H Outdoor Skills Shooting Sports Program, and forestry education activities of working with the FFA State Forestry Contest were other youth related activities for this reporting period. A total of 422 4-H youth were directly impacted in these areas.

Activities in the wildlife management program directly impacted 363 individuals by way of direct contact at meetings and programs throughout the state. A continuing education wildlife management program dealing with the management of white-tailed deer directly impacted 33 individuals who indicated the program content was worth an average of \$5,000 each by way of knowledge gained. Other topics whose information was made available to program attendees throughout the reporting period included establishment and management of wildlife food plots, management of game and non-game wildlife species, wildlife management in production agriculture, and land management issues when dealing with endangered species.

Nine Nuisance Wildlife and Rodent Control Programs dealing with the control and management implications for rodents and nuisance wildlife impacted 353 individuals in the report period. Two hundred and seventy eight of these individuals received educational information as part of their licensing requirements for pesticide application in various rural and urban settings. The average value of the information received by these individuals was reported at \$50,000 due to the ability to continue with their control program after having received the necessary certification training.

## **Source of Funds**

Renewable Resources Extension Act (RREA), Hatch, and state funds.

## **Scope of Impact**

Multi-state: It is estimated that 25% of the wildlife extension/outreach program is attributable to multi-state collaboration in planning, implementation, and training. A total of 1.91 FTEs was expended on this program in FY 2003. The dollar equivalent of multi-state work is \$38,265 (1.91 FTEs x \$80,136 per FTE x .25)

Multi-function: The wildlife extension/outreach program is a totally integrated research-extension effort. The dollar equivalent of multi-function work is \$153,060 (1.91 FTEs x \$80,136 per FTE x 1.0).

**GOAL 4  
RESEARCH SUMMARIES**

## Federal Goal 4

### Title: Dredge Spoil for Wetland Creation in Coastal Louisiana

#### Key Theme: Coastal Erosion

#### Gary Breitenbeck, Professor, Agronomy Department, LSU Agricultural Center

**Issue:** Cost-effective technologies for creation of wetlands are needed if the limited resources available are to significantly offset the pervasive loss of mature coastal wetlands occurring in coastal Louisiana. Beneficial use of dredge spoil is a promising technology for wetland creation in the coastal zone. Several recent reconstruction projects in the Barataria Basin have used hydraulic dredges to pump unconsolidated sediments from channel bottoms to successfully create gently sloping wetland areas. These largely unconsolidated sediments are highly susceptible to erosion, especially during storm events. Rapid establishment of vegetative cover protects recently created wetlands from water and wind erosion and enhances their ecosystem function.

Coastal reconstruction projects commonly specify transplanting of nursery-grown *Spartina alterniflora* in the intertidal zone to protect shorelines. These plantings are labor-intensive and often logistically challenging, and therefore costly. Moreover, mortality of transplants over time is often very high, apparently because the environments in which they are planted are inappropriate for survival or vigorous growth. To provide guidance that enhances the success of routine plantings of created wetlands in coastal Louisiana, optimal planting environments must be more accurately delineated and practical methods devised to reliably identify these environments prior to planting.

Monitoring the success of vegetative plantings is a challenging problem in sediments that often will not support the weight of workers. Destructive sampling techniques (biomass harvesting) provide reliable data, but require large plots and do not allow the progress of individual transplants to be monitored. Non-destructive phenometric techniques have been found to offer performance data comparable to biomass harvesting, but soil disturbance generated by foot traffic when collecting extensive field data undoubtedly impacts future growth of plants growing in semi-fluid sediments. The availability of high resolution, low-cost digital cameras and image analysis software suggests that a combination of image analysis and phenometric techniques may yield techniques that are less invasive. Moreover, use of image analysis could substantially improve monitoring efficiency by greatly reducing the time and cost associated with field data collection.

**What was done:** A study was conducted to assess the effects of various methods of propagating and planting *Spartina alterniflora* (cult. Vermillion) within a tidally influenced gradient of a coastal area reconstructed from hydraulic dredge spoil. The effects of planting elevation were also assessed.

To avoid damage to plantings during routine monitoring, a method involving the use of image analysis was developed to determine survival and growth. The relationship between various phenometric measurements and total biomass were studied.

**Impact:** If we are to restore significant amounts of coastal marsh within the available funds necessary to identify the most cost-efficient methods for restoration. The primary purpose of this study was to provide guidance to agencies sponsoring vegetative plantings. In the past, some requirements have added greatly to the cost of producing, transporting, and planting *Spartina alterniflora*. The principal finding of our work indicates that when the planting zone is carefully delineated, all vegetative plantings survived and flourished regardless of propagation method, growth medium, and pre-plant treatments such as salt hardening. When plantings were located above or below the optimal elevation (but within the tidal zone), survival was poor and those surviving did not flourish. Focusing contractual specifications on optimal planting elevations rather than on unnecessary propagule requirements will not only enhance vegetative stabilization of reconstructed wetland sediments, but will allow contractors to use the most cost-effective plant materials and thereby lower planting costs.

The use of image analysis is a promising non-invasive technique for monitoring a large number of plants at minimal cost. A combination of measurements of plant height, spread, and number of stems at an elevation of 15 cm showed the strongest correlation to aerial biomass. Additional studies are needed to refine the technique for assessing density following closure of the canopy.

**Source of funding:** State, Hatch, USDA-CSREES

#### **Federal Goal 4**

**Title: Improved Technology for Composting**

**Key Theme: Cost Effective Solid Waste Management**

**Gary Breitenbeck, Professor, Agronomy Department, LSU Agricultural Center**

**Issue:** The leadership position enjoyed by LSU AgCenter's Callegari Center requires that we continue to support the commercial composting industry with improved technology. A current issue in compost facility design relates to scaling facility size to accommodate resource streams. The amount of storage required and the amount of compost produced depend largely on the extent of material volume and mass reduction during composting. Little is known of these reductions because direct measurements are difficult, if not impossible, in most facilities. Perhaps the greatest economic challenge of commercial composting is development of profitable markets for finished compost. The limited value of many composts for use as soil amendments and growth medium often results in stockpiles of negative value. A principal deficiency of composts results from their poor value as a source of plant nutrients. While losses of ammonium during composting are commonly observed, little is known of the conservation of important plant nutrients during the composting process.

**What was done:** A study was conducted using compost windrows constructed of various feedstocks to identify the conserved constituent for use as an internal standard for calculating mass loss. Ash was found to be the most reliable parameter. A series of equations was developed to determine material volume loss based on changes in ash content. The equations were extended to incorporate bulk density measurements for calculating volume loss during composting. These equations were subsequently extended to calculate the extent to which any constituent or nutrient was conserved during composting. A study was then conducted to characterize the factors related to the conservation of N and other plant nutrients during composting.

**Impacts:** The equations developed and the estimates of loss reductions during composting will likely be used by engineers in compost facility planning. Smaller facilities will use the estimates to determine the amount of product they will generate from various feedstocks. The substantial losses of N observed during composting of some materials will alert composters of the potential for loss of this important nutrient and suggest alterations in procedures that can reduce nutrient losses.

**Sources of funding:** State, Hatch

#### **Federal Goal 4**

**Title: Adsorption and Release Kinetics of Arsenic in Selected Louisiana soils**

**Key Theme: Sustainable Agriculture**

**H. Magdi Selim, Professor, Department of Agronomy and Environmental Management,  
Louisiana Agricultural Experiment Station, LSU Agricultural Center**

**Issue:** Arsenic is an environmental toxic element commonly occurring in soils and water. High concentrations of arsenic can be introduced into soils through industrial waste disposal, mining activities, and insecticide applications. In addition, land application of swine and poultry wastes leads to the accumulation of arsenic in soils and potential runoff. Knowledge of adsorption and release of As on soil mineral surfaces is a prerequisite for predicting its fate in the soil environment. Several studies have demonstrated that arsenic adsorption is correlated with soil clay contents and also Al and Fe oxides. Inner-sphere complexation on various charge mineral surfaces (Fe, Al and Mn oxides and hydroxides; allophanes, imogolite) is a possible pathway of As sorption in soils. Numerous examples are available which illustrated the use of the equilibrium approach for describing As adsorption and release in soils. Kinetic data, which are infrequently measured, have the advantage of taking into account possible time-dependent reactions for adsorption, release, or desorption. Lack of equilibrium conditions may be due to heterogeneity of sorption sites and slow diffusion to sites within the soil matrix, i.e., slowly accessible sites with variable degrees of affinities to heavy metals.



**What was done:** Research was conducted to quantify the kinetics of adsorption and desorption of arsenic (As(V)) in Sharkey clay and Olivier silt loam soils; and to assess equilibrium and multiple-reaction kinetic type models in their capability of describing the sorption as well as release behavior of arsenic in these two soils. Batch experiments were conducted to determine adsorption and desorption isotherms for As (V) by our two soils. The technique used here is kinetic batch type for a wide range of concentrations. Release or desorption commenced immediately after the last adsorption time step where sequential or successive dilutions of the slurries were carried to induce heavy metal release. Adsorption results were described based on a Freundlich equilibrium model. For Olivier soil, the isotherms exhibited somewhat similar nonlinearity and kinetic behavior except that lower retention maxima were observed. Release results for As behavior in Sharkey clay soil exhibited hysteretic behavior resulting from discrepancy between adsorption and desorption isotherms. Adsorption-desorption isotherms indicate that the amount of irreversible or nondesorbable phases increased with time of reaction. As(V) may be retained by heterogeneous type sites having a wide range of binding energies. Modeling efforts included evaluation of a multireaction kinetic approach to describe As(V) retention kinetics in soils. A major feature of the multireaction model is that it considers several interactions of a reactive solute with soil matrix surface. Specifically, the model assumes that a fraction of the total sites is kinetic in nature whereas the remaining fractions interact rapidly or instantaneously with solute in the soil solution. The multireaction model accounts for reversible as well as irreversible retention reactions of the concurrent and consecutive type.

**Impact:** Binding of arsenic may be irreversible resulting in extremely low rates of release into the soil solution. Moreover, such irreversible retention increased with time. Stronger retention and/or slow release are beneficial in minimizing amounts of arsenic that are susceptible to leaching in the soil and for runoff losses into the environment.

**Sources of funding:** State, Hatch, Multi-State, Industry

#### **Federal Goal 4**

**Title: Enhancing Rice Production with Improved Fertility and Cultural Management Practices**

**Key Theme: Sustainable Agriculture**

**Patrick K. Bollich, Professor, and John K. Saichuk, Professor, Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center**

**Issue:** This project is applied in nature and is designed to address production problems, improve agronomic practices by efficient utilization of inputs, and mitigate concerns regarding soil erosion and water quality. These objectives are accomplished by conducting research both on the research station and on-farm throughout the rice-producing areas of Louisiana. In 2003, research studies were conducted to determine the effectiveness of new fertilizer products,

improve efficiency in fertilizer management, and evaluate the effectiveness of conservation tillage practices in reducing soil erosion and improving water quality.

**What was done:** The efficiency of nitrogen fertilizer in water- and drill-seeded rice was determined at various application timings. Depending on timing, resulting grain yields were affected by 10-15% from the most to least efficient method. A urease inhibitor product was found to be effective in increasing the efficiency of urea fertilizer when the time between its application and flood establishment is delayed or when the soil surface is saturated at the time of application. Conservation tillage studies again supported the fact that in drill-seeded systems reduced tillage practices are as effective if not more effective than conventional tillage in reducing loss of soil and nutrients in floodwater runoff but also provide a slight increase in yield. Conversely, the use of conservation tillage techniques in certain water-seeding practices has been effective in reducing pollutants but has been detrimental to production.

**Impact:** Rice producers benefit tremendously from the results of these research studies. Proper timing of inputs improves yields, decreases the cost of production, and minimizes any negative effect of nutrient management in rice on the environment. New products that conserve fertilizer inputs increase their efficiency and minimize loss to the environment. Reduced tillage practices have a real potential to decrease input costs and at the same time sustain production at economic levels and mitigate environmental concerns.

**Sources of funding:** Hatch, State, and private funding

#### **Federal Goal 4**

**Title: Effects of Insects and Environmental Modifications on Forested Wetlands**

**Key Theme: Care and Protection of Forest Ecosystems**

**Name: Richard Goyer, Professor, Department of Entomology, LAES, LSU AgCenter**

**Issue:** Presently, vast acreages of ecologically important forested wetlands in southern Louisiana have been decimated or are in varying states of decline due to the interaction of several anthropogenic and biological processes. One important component of freshwater wetlands restoration and preservation includes river diversions that re-introduce sediment and nutrients from the Mississippi River to slow/reverse lands subsidence, increase soil fertility and flush salt encroachment lethal to keystone forest species such as baldcypress and tupelo. A second component of restoration is evaluating tree genotypes that maximize productivity while minimizing or tolerating adverse effects of system stress. Further, the combination of these activities has had long-term effects on present insect-caused herbivory, and the impact of populations of these insects has further exacerbated forest declines.

**What was done:** A research initiative was implemented to evaluate the interactions of saltwater intrusion, lack of nutrient and sediment inputs and herbivory by two insect herbivores – the

forest tent caterpillar (FTC) and the baldcypress leafroller (BCLR) – as a precursor to planned and on-going state-federal restoration efforts. Firstly, a greenhouse study, feeding assays, and field experiments were designed to evaluate the interactive effects of salinity, hydrology, nutrients, and herbivory by the baldcypress leafroller (BCLR) and the forest tent caterpillar (FTC) on baldcypress and water tupelo, respectively. The greenhouse study showed that insect defoliated cypress saplings in the fresh, nutrient-poor treatment grew less than controls in that same regime, and were similar in growth to salt-treated (3 ppt) saplings. Herbivory under fresh, nutrient rich conditions also reduced sapling growth, similar to fresh, nutrient-poor samplings without herbivory. The FTC and BCLR were fed leaves from treated greenhouse saplings. The BCLR female pupal weight was not affected by environmental conditions of the saplings, however, FTC pupal weights were highest in fresh, nutrient-rich treatments and lower in the nutrient-deprived and salt-stressed treatments.

After 2 years of multiple stress exposure, saplings were removed from their treatment environments (salt, flooding, no fertility) and were subjected to uniform restoration conditions expected from a river diversion (40 days flooding along with nutrient enhancement followed by a growing season water drawdown). Mortality occurred in those exposed earlier to salt treatments, 42%, as opposed to 3% in the freshwater treatments. In December, growth of those recovery saplings showed that, with the exception of those that died, height growth was similar among stress exposed saplings.

Secondly, a 3-year field study of nutrient augmentation to trees in swamps showed that fertilizer application increased nitrogen levels in the leaves, as well as basal area growth of individual trees. Basal area of baldcypress was higher than tupelo in the intermediate and sparsely forested sites (the more degraded sites), but not at the highest density site (the healthiest of the three sites), where growth was similar between the species. Nutrient content of leaves (phosphorous and nitrogen) was positively correlated with tree density among the sites. Tupelo had higher leaf nitrogen content than baldcypress. However, upon analyzing frass content, BCLR frass contained as much as six times more nitrates than the FTC. Adding inorganic nitrogen to trees increased basal area growth, foliar nitrogen and phosphorous, and overall nitrogen content of frass. However, frass nitrate and ammonia (nitrogenous forms causing eutrophication) did not increase when trees were fertilized.

Thirdly, experiments to determine how genotypic variation, fertilization and thinning of baldcypress will affect the performance of the baldcypress leafroller (BCLR) were conducted. Five half-sibling genotypes of baldcypress growing in a seven yr.-old plantation were subjected to zero, 2133 lbs./acre, and 4266 lbs./acre of slow release fertilization. Additionally, one half of a similar plantation was thinned to 50% of the unthinned side and allowed to recover for 2 years. We found that, among the five genotypes, female and male larvae reared on foliage from the low fertilization level trees displayed significantly higher dry pupal weights than those reared on foliage from the control.(no) fertilization. Thinning did not appear to have any short-term impact on development of BCLR larvae or pupae. Leaves from the fertilized trees level were significantly higher in nitrogen and potassium, numerically higher in moisture content, and contained significantly lower levels of phenolic compounds, helping to explain the results

obtained above. Genotype alone was an important factor, with genotypes that leafed out early in the spring having lower nutrient contents and subsequently lower insect performance levels.

**Impact:** Results indicate that herbivory of wetland trees acts in concert with a low-nutrient environment to reduce growth. However, in areas where salinity reaches or exceeds 3 ppt, salinity is the driving factor for suppression of tree growth, and leads to extensive tree mortality. Nitrogen loading from diverted Mississippi River water can enhance tree productivity of both species. Saplings of both cypress and tupelo can recover from salt, flooding and insect defoliation stresses when provided nutrient rich, non-flooded conditions. Studies of genotypic variation and its interaction with insect herbivory and tree fertilization revealed that the cypress leafrollers produced larger females with higher reproductive capacity when raised some genotypes of fertilized trees. Thus, it is important that planned restoration efforts should include carefully selected planting stock (genotypes) where herbivory by insects is indigenous. Nutrient inputs from river diversions also are important in growth, survival and nitrogen cycling in forested wetlands.

**Sources of funding:** Hatch, State, LDAF

#### **Federal Goal 4**

**Title: Development of an Integrated Control Program for Stable Flies**

**Key Theme: Integrated Pest Management**

**Lane Foil, Professor, Department of Entomology, LAES, LSU AgCenter**

**Issue:** Insects and acarines cost the U.S. livestock producer in excess of \$3 billion annually; loss of over \$2 billion annually is suffered by the beef cattle industry. The stable fly, *Stomoxys calcitrans*, is considered to be the second most important pest of cattle, and there are no effective control measures available for the adult flies. The stable fly has emerged as a tremendous pest of pastured cattle due to the increased use of large, round hay bales as hay supplementation for cattle. Residues from these round bales are trodden upon by cattle, and mixed with dung and urine; this mixture may constitute the greatest single stable fly breeding medium in the South.

**What was done:** Preliminary studies on adult stable fly control were conducted. Comparisons were made of cloth targets to sticky Alsynite Broce traps plus two traps that have been more recently developed, the Nzi and the Epps. The Nzi trap is triangular and made of blue and black cotton fabric; the trap was developed in Africa for catching tsetse and stable flies. The Epps trap was designed as a horse fly trap and is commercially available. We compared the Broce trap to the Nzi trap and the Epps trap in a 3X3 Latin Square design repeated 3 times at 3 sites. The average number of flies per hour per tap was 30.4 for the Broce, 112.2 for the Epps, and 198.1 for the Nzi. Subsequently, we compared the Nzi and Broce to an electric 1 m square 50% blue-50% black (UK) target in a 3X3 Latin Square design repeated 2 times at 2 sites. We captured from 39.7 to 62.1 times more stable flies on the target compared to the Broce trap. The capture

on the target was approximately twice that of the Nzi. In subsequent studies, the mean hourly catch for a UK target for 9 one-hr assays was 527 with a maximum of 1,335 flies per hour.

**Impact:** It has been demonstrated that permethrin-treated Alsynite traps at a rate of one per five head of cattle at two sites in Florida provided a more than 30% reduction of a stable fly population. The results of the trap comparison studies indicate that our targets will be much more effective than these traps, and that we should be able to achieve adult stable fly control with a reasonable and manageable number of targets. The data indicate that one treated target could have a potential to eliminate over 10,000 adult stable flies per day.

**Sources of funding:** Hatch, State, USDA-CSREES (Southern Region IPM Grant)

#### **Federal Goal 4**

**Title: Operation Quality and Methodology Research of the Louisiana State Soil Testing and Plant Analysis Laboratory**

**Key Theme: Soil Testing and Nutrient Management**

**Jim Wang, Assistant Professor, Department of Agronomy and Environmental Management, LAES, LSU AgCenter**

**Issue:** Efficient use of land for profitable agricultural crop production depends on fertility status of soils. One important tool to characterize soil fertility is to utilize chemical analysis of nutrient status and its correlation with crop growth. For years, many chemical test methods have been developed and correlations/calibrations have been established for various crops. While these tests and fertility interpretations have generally served the purpose of supporting production, the agricultural industry is facing increasing challenge in maintaining environmental quality from deteriorating as a result of field practices. The concern over environmental quality has sparked reexamination of many testing procedures, fertility interpretations, and recommendations. In Louisiana, many established soil test procedures, ratings and recommendations were developed thirty years ago. Differences in nutrient use efficiency of new crop varieties developed over years require continuous update of calibration in fertilizer amendments. In addition, taking advantage of non-traditional nutrient source such as silicon requires development of new testing methods. On the other hand, more and more soil testing data are being used for making policy decisions by state and federal agencies. There is a need that soil testing and plant analysis laboratory develops and implements modern quality assurance programs so the lab can meet higher accuracy and efficiency requirements. The latter will insure the laboratory to better serve Louisiana farmers in making correct nutrient management decisions.

**What was done:** Phosphorus testing and fertilization has important implication in crop production and water quality. During 2003, phosphorus testing using different methods and P management along with zinc fertilization were evaluated for corn production at LSU AgCenter Dean Lee Station in a Red River alluvial calcareous soil. Various chemical fractions of P were

compared with soil test extractions for understanding usability of the tests. Accuracy of phosphorus fertilization was also evaluated for sugarcane production in a Jeanerette silty clay loam. For sugarcane production, we also investigated the sensitivity of critical level rating for potassium in relatively heavy texture soil. In addition, the benefit of zinc application in sugarcane was studied at two on-farm locations, an acid soil site and an alkaline soil site. Finally, we evaluated different extraction methods for soil available silicon for possible use of silica slag in sugarcane production.

**Impact:** Results of test comparisons for calcareous alluvial soils may finally resolve a deficiency in P fertility interpretations based on currently-used Bray 2 test, which is apparently overestimating P availability. This resolution can have important implication for Red River alluvial soils, an important agricultural area for row crop production in Louisiana. The improvement in P testing interpretation can help farmers to efficiently use P fertilizer resources.

Zinc testing and field calibration helps the laboratory to establish critical levels used for benefit use of zinc fertilizer in sugarcane and other crop productions. The preliminary results show that Zn application can increase sugar yield by 22-32% in both acid and alkaline soils that test low in Zn by DTPA method. A recent survey by our laboratory showed that many Louisiana soils including those for sugarcane production are deficient in Zn. This research can help sugarcane farmers to boost their profits with wise utilization of Zn amendments.

Evaluation of soil test methods for silicon will help the laboratory to establish a routine procedure for predicting silicon nutrition. Silica slag, a by-product, has been shown to increase sugarcane and rice yields in organic soils elsewhere. However, the method to characterize soil available silicon has not been developed for Louisiana soils which are predominately mineral. The successful development of this test can help farmers to avoid unnecessary addition of silica slag in crop production.

**Sources of funding:** State, Hatch, Louisiana Soybean and Grain Research and Promotion Board, American Sugar Cane League

#### **Federal Goal 4**

**Title: Nutrient Inputs to Surface Waters from Animal and Crop Agriculture**

**Key Theme: Nutrient Management**

**Lewis A. Gaston, Associate Professor, Department of Agronomy and Environmental Management, Louisiana Agricultural Experiment Station, LSU AgCenter**

**Issue:** Input of nutrients such as carbon, nitrogen, and phosphorus (P) from agricultural lands to surface waters may overly enrich the receiving water bodies with these nutrients, stimulating excessive growth of aquatic plants, algae and other microorganisms, and deteriorating water

quality. Louisiana agriculture faces the challenges of preserving or improving water quality downstream from animal operations and in crop land areas.

Poultry is our major animal industry and the impact of poultry waste (litter) applied to crop, pasture or forest land on downstream water is a major environmental concern. Although several constituents of poultry litter may adversely impact surface water quality, P has received the greatest attention because it is typically the most limiting nutrient in freshwater. Thus, enrichment of freshwater bodies with P tends to induce eutrophication. The challenge Louisiana faces is to prevent this from happening. Current research is: (1) exploring alternative, beneficial uses for poultry litter, (2) verifying the environmental benefit of poultry diet modification on P loss from litter, (3) inventorying soils for their capacity to retain P against its extraction into runoff water, (4) developing better analytical methods and models for predicting P loss from soil, (5) examining the potential of phytoremediation to reduce the level of P in soils that are overly enriched with it, and (6) developing a training program in GIS-based water quality simulation to assist producers with P management decisions.

The Louisiana Department of Environmental Quality (LDEQ) has undertaken an exhaustive assessment of water quality in our approximately 500 river / stream segments. LDEQ findings show that many are impaired and total maximum daily loads (TMDLs) have or will be prescribed for these. In some cases, runoff from crop agriculture seems the likely cause for impaired water quality. This is true for Bayou Plaquemine Brule in Southwest Louisiana. The TMDLs for Plaquemine Brule stipulate a 30 - 50 % reduction in oxygen-depleting materials such as organic carbon and ammonical nitrogen. It is thought that general adoption of best management practices (BMPs) by area producers of rice and soybeans, and beef cattle (pasture) and crawfish will remedy the problem. However, this must be demonstrated at the field and watershed scales.

**What was done:** Poultry waste research area (1) continued projects that are tracking growth responses of pine trees to soil fertilization with poultry litter. Until early 2003, statistically significant responses had not been seen, however, this changed last year. Research area (2) examined P loss from litter generated from poultry fed a phytase-amended (reduced P supplement) diet. Although litter from the modified diet contained less P than that from the conventional diet, there was no significant difference in the rate of release bioavailable P into surface runoff. Examination of P retention by Louisiana coastal plain soils (research area 3) found substantial differences among soil types and within soil types depending on landscape position and / or chemical and physical properties. Previous research on the use of a miscible displacement technique (research area 4) for predicting dissolved P loss into runoff was continued using additional soils and a simpler protocol. As previously, agreement between measured P in runoff and that generated by the laboratory method were superior to conventional extraction methodologies such as with water or Bray 2. Hay harvest of bermudagrass, especially together with winter ryegrass (research area 5), continues to show promise from quickly reducing surface soil levels of P. Research area (6) is developing a training program for land managers on the use of a GIS-based AnnAGNPS water quality simulation model. Instructional parts include

GIS and model use. A spatial data set (digital elevation and soils maps) for the major poultry producing parishes in Louisiana has been compiled.

Water quality monitoring stations in Cole Gully (a sub-watershed of Plaquemine Brule) and at paired rice / row crop fields in its watershed were installed and put into operation in 2003. Tentative data suggest that implementation of BMPs for these crops will meet prescribed TMDLs. The AnnAGNPS model was set up for Cole Gully watershed. Since nearly all fields there are leveed and hydrologically isolated, AnnAGNPS hydrologic cells consist of single land uses and sets of operations. This is expected to aid model calibration / validation by avoiding the confounding effect of hydrologic cells that often span multiple cropping systems.

**Impact:** Poultry litter: (1) response of pine to litter fertilization is important because widespread use of poultry litter for forest fertilization would greatly expand the land area to which litter is applied; (2) negligible difference in release of bioavailable P despite reduced P supplement to feed calls into question the immediate benefit of diet modification on subsequent P release; (3) knowledge of spatial variability in P retention may be used by producers to adjust rates of poultry litter application so as to minimize P loss in runoff; (4) a convenient and reliable method to predict P loading from soil into runoff is needed and the miscible displacement method is promising in this regard; (5) phytoremediation of high levels of soil P by hay harvest is consistent with on-going farm operations and may be more effective than other approaches proposed, such as amending the soil with aluminum or iron to reduce P solubility; (6) use of a GIS-based water quality model with nutrient management planning at the farm-scale would allow easy examination of the relative benefits of different scenarios.

Rice / row crops: Besides addressing the immediate issue of the adequacy of BMPs for improving water quality in Cole Gully, the scope of this research (watershed scale) and its partnership with sister projects are new approaches to addressing water quality problems. The thinking is that most future research on water quality will follow this model so that these projects are pioneering in this regard.

**Sources of funding:** USDA, LDEQ

#### **Federal Goal 4**

**Title: Atrazine Retention by Sugarcane Mulch Residue**

**Key Theme: Sustainable Agriculture**

**H. Magdi Selim, Professor, Department of Agronomy and Environmental Management,  
Louisiana Agricultural Experiment Station, LSU Agricultural Center**

**Issue:** The presence of mulch residue on the soil surface protects it from water and wind erosion and conserves soil water for crop production. Recycled crop residues can be a temporary storage medium for herbicides, altering patterns of chemical dispersion in conservation tillage when



compared to conventional practices. The effect of surface crop residues on interception, subsequent wash-off, and movement of herbicides through soil are major concerns associated with no-tillage practices. Adsorption and desorption kinetics are essential components for describing the movement and retention of applied agricultural chemicals in soils and that which is susceptible to runoff.

**What was done:** We investigated the retention characteristics of sugarcane (*Saccharum* Spp. Hyb.) mulch residue for atrazine based on studies of adsorption-desorption kinetics. Adsorption kinetic batch method was used to quantify retention of the mulch residue for a wide range of atrazine concentrations and reaction times. Desorption was carried out following 504 h of adsorption using successive dilutions which was followed by methanol extraction. Atrazine retention by the mulch residue was well described using a linear model where the partitioning coefficient ( $K_d$ ) increased with reaction time from 10.40 to 23.4 cm<sup>3</sup>/g after 2 and 504 h, respectively. Values for mulch residue  $K_d$  were an order of magnitude higher than those found for Commerce silt loam soil where the sugarcane crop was grown.

**Impact:** Strong atrazine retention by the mulch residue is beneficial in minimizing potential runoff losses and downward movement in the soil. Average atrazine recovery following successive desorption steps were two third of the amount adsorbed. Moreover, a hysteresis coefficient based on the difference in the area between adsorption and desorption isotherms was capable of quantifying hysteresis or desorption isotherms.

**Sources of funding:** State, Hatch, Multi-State, Industry

## Goal 5

LSU Ag Center Goal 5 is to enhance economic opportunities and quality of life for families and communities.

### Research Reports

Chitosan, a biopolymer produced from crawfish shell waste was examined to determine whether its antimicrobial and gel forming properties could improve weight retention, lower vapor transmission, and prolong the shelf life of foods. The material did demonstrate it could enhance the shelf life of eggs during 5 weeks of storage at 25°C. It was found that whole viscera and the liver portion of catfish may serve as a good source of health-promoting fatty acids. Adding value to crawfish shell waste and catfish viscera would minimize pollution problems and offset costs associated with disposal of waste.

A survey of consumer preferences for emu leather apparel products revealed that most of the “young adult market” were not knowledgeable or familiar with the products and as a result, attitudes toward the product were negative. Recommendations that resulted from the research involve urging the emu leather industry to develop promotional strategies to educate young consumers.

Research on development of biobased nonwoven composites to target a thrust application area in automotive interior manufacturing also targets the national research priority for developing biobased products from agricultural renewable resources. Nonwoven composites from bagasse, kenaf, and raimo were developed for automotive interiors and then evaluated in terms of mechanical properties, wet properties, thermal properties, and acoustical properties.

Several studies have been initiated to develop value-added rice starch based ingredients. Of particular interest is the use of broken rice kernels, which make up 15% of the milled rice in the United States, to develop these ingredients from rice starch and flour. The research will benefit the Louisiana rice farming and processing industries by providing a new utilization for rice that will result in an increase its national competitiveness and demand in the food ingredient and product market. The research should lead to an easily incorporated source for fiber that can be beneficial in prevention of diseases such as diabetes and cancer.

Glucooligosaccharides were produced during dextran fermentation using a chain shortening acceptor and a specific microbial strain. These polysugars have significant market potential as functional foods and as a possible poultry feed additive to help replace antibiotics in raising “safe” poultry.

## Extension Reports

Examples of accomplishments in Extension programs:

- The Louisiana character education program initially based in Louisiana's school system but now expanding into communities is in its seventh year. During the 2002-2003 school year, a total of 315,185 individuals were involved in the program – 3,623 adult instructors, 3,274 youth instructors, 182,665 students in public, private, and home-based schools, and 49,106 persons outside the school system. Research-based educational materials, guest speakers, consultants and train-the trainer sessions are provided to schools, workplaces, sports programs, prisons and probation organizations, government agencies, and youth development organizations.
- Multi-faceted education programs in economic development have led to (a) Louisiana residents learning current social and economic conditions, increasing their understanding of economic development alternatives, developing and implementing strategic community development plans, and beginning the processes of local capacity building and sustainable development for developing their communities; (b) community leaders and volunteers in a number of parishes developing leadership and organization skills, and planning and implementing a variety of community projects in parishes such as a community playground and a 200-seat amphitheater, and a retirement center; (c) business promotion efforts such as entrepreneurship workshops, federal renewal communities tax and credits incentives training, value-added product development and e-business training, and new and alternative marketing strategies opportunities; (d) major tourism development programs – natural resource and recreational tourism, agritourism, farmers markets, well-maintained visitor infrastructures, natural resource assets mapping, festivals and cultural events, and national and state parks and heritage area development; (e) workforce preparation education wherein 1,400 adults and youth learned about ethics and appropriate workplace behaviors, and gained skills in career exploration, customer relations, communication, team building, conflict resolution, professional development, and management.
- During the program year 2003, the family economics education program reached over 20,000 individuals and families helping them to learn and apply financial management and budgeting skills. Sample surveys of family resource management programs showed that over 90% of participants planned to follow recommended management practices such as making and using a spending plan and tracking monthly spending, paying bills on time, setting financial goals and priorities, and building a fund for unexpected expenses. High School financial planning workshops reached 200 Free Enterprise teachers who will, in turn, reach approximately 20,000 students. In the Your Path to Home Ownership Program, 189 individuals learned how to better manage their finances, overcome personal obstacles to home ownership, avoid costly mistakes during the home buying process, and protect their investment.

- In the Louisiana Master Gardener Program during the program year 2003, 249 new volunteers were trained and 782 senior master gardeners remained active. These volunteers gave 39,035 hours of service (equivalent to 18.7 Extension paraprofessional FTEs) valued at \$645,639, based on the U.S. Department of Labor's wage rate of \$16.54 per hour. Master gardeners greatly assisted local extension professionals in garden shows reaching about 19,000 homeowners looking for gardening information.
- Approximately 6,000 parents, grandparents, and teen parents gained parenting knowledge and skills through various workshops such as Every Touch Counts, Bringing up Children, and Children in the Middle. Sample surveys of program participants showed that more than 80% of parents attending these workshops learned and planned to follow 3 different parenting practices that were taught in the workshops – helping their child's brain development, using a democratic parenting style, and effective communication with children.
- In FY 2003, the 4-H leadership and volunteer development program had 9,129 adult volunteers, and 5,024 youth volunteers; 2,100 youth were enrolled in 4-H leadership projects; 7,425 youth served as club officers or in parish leadership roles; 2,583 youth were enrolled in citizenship and civic education projects; over 31,250 youth were involved in at least one community service project and 12,328 participated in service learning projects.
- Outcomes of workforce preparedness programs for youth included 192 youth learning social, etiquette and dressing-for-the-work-environment skills; 179 youth understanding their responsibilities (punctuality, attendance, etc.) for ensuring job success; 672 youth writing their first resumes; 2,959 youth demonstrating career preparation skills and options.

Total extension expenditure on Goal 5 programs is \$13,716,879. Of this amount, \$3,657,044 is attributed to multi-state work, and \$1,907,796 is multi-function work.

Total Extension FTEs on Goal 5 programs were 171.17 and 3,106,234 educational contacts were made.

**GOAL 5**  
**EXTENSION SUMMARIES**

## **Federal Goal 5**

**Title: Building Better Child Care through University Outreach and Extension Education**

**Key Theme: Child Care**

**Becky White, Associate Professor (Family Development), School of Human Ecology, LSU AgCenter**

### **Program Description**

The LSU AgCenter conducts the Louisiana Child Care Provider Training Program for child care providers in center-based and family-based settings to assist them in obtaining required hours of continuing education. Twenty-one (21) LSU AgCenter faculty members conducted the program in 43 of Louisiana's 64 parishes.

Stakeholder Input. Child development researchers note the critical importance to quality child care for positive child development outcomes as well as documenting the poor to mediocre state of child care quality. Further, they have found that education (formal and informal) directly correlates with higher quality of care for children.

Family and Consumer Sciences (FCS) agents specializing in family development by consensus determined to focus on this professional effort.

All child care providers have been contacted in 43 of 64 parishes across Louisiana with information regarding the Louisiana Child Care Provider Training Program. Continual input is sought from all participating child care providers to ensure the program is relevant and useful for their professional work.

Numerous child care providers in over 45 parishes have requested that Extension FCS agents provide training opportunities.

Based on the above input, the Louisiana Child Care Provider Training Program was continued in FY 03. Over 3,000 different child care providers sought multiple Extension child care training program opportunities during FY 03. Over 8,800 continuing education documentation certificates were awarded.

Problem. Child development researchers have noted that high quality child care is a critical issue for improving developmental outcomes and the quality of life for children. Although quality of child care is critical, research indicates that most child care is poor to mediocre. Child care provider knowledge of child development and best practices with children is inadequate. Often, child care providers have only a high school education at best and have never had a course in high school in child development.

Research has shown that education and training of child care providers directly correlates with higher quality care environments for children. It is estimated there are over 15,000 child care providers in Louisiana. The state of Louisiana through the Department of Social Services

requires all child care providers in licensed centers or who are registered family child care homes to obtain various amounts of continuing education annually.

Child care providers have repeatedly stated that they need access to trainings that are offered locally. Extension FCS agents located in communities across the state are able to provide local training options. Child care providers have identified topics that are the most relevant for them to improve the quality of their care for children. Based on stakeholder input the Louisiana Child Care Provider Training Program is offered locally in 43 towns/cities across Louisiana covering topics identified by researchers and child care professionals as most relevant and critically needed. Topics include Social Development of Children, Emotional Development of Children, Cognitive Development of Children, Focus on Infant Development, Creating a Learning Environment, Child Care as a Business, Guidance and Discipline, Nutrition for Young Children, Culturally Sensitive Care, Working with Children With Special Needs, Routines, Group Care and Routines.

Initiation and Progress of the Program. The Louisiana Child Care Provider Training Program was initiated in 2001 and was continued in FY 03. FCS state administration and state family development specialists worked to develop a strong relationship with new leadership within the LA Department of Social Services which is responsible for oversight of the licensing of child care centers and registered family child care home centers and for implementing the Louisiana Child Care Assistance Program. Two state family development specialists and twenty-one (21) FCS agents implemented the continuing education program as a team. Regularly, training announcements were sent to child care providers at all state licensed child care centers and registered family child care home centers.

### **Program Impact**

With 21 FCS agents reporting, 375 educational classes were conducted for child care providers in 43 locations across Louisiana. Over 8,800 training certificates were awarded to child care providers who participated in three-hour training sessions offered by the LSU AgCenter.

An external program performance audit conducted by the state legislative auditor found that 98.4% of the child care providers who responded to a survey thought the training they received from LSU AgCenter faculty was relevant to them and they were satisfied with the program.

All 8,800 participants were surveyed following the 375 educational classes to assess knowledge gained, intent to adopt recommended practices, appraise participant satisfaction with the training, and solicit ideas for improving the program. With almost all participants reporting, it was found that:

Participants were overwhelmingly satisfied with the program (over 99%). Participants indicated they gained knowledge of child development, ideal caregiving styles, best guidance and discipline techniques and their importance as an early teacher of young children.

Participants indicated they would implement recommended child development practices – choosing activities that help children’s development, practicing best caregiver style, communicating in a positive manner, providing a safe and healthy home for children and using appropriate guidance and discipline techniques

#### **Source of Funds**

Smith-Lever funds, state funds, parish funds, associated program fees.

#### **Scope of Impact**

State Specific, Extension-only Function Program

In FY 2003 11.93 FTEs were spent on the child care program for a total program cost of \$ 956,022 (11.93 FTEs x \$80,136 per FTE).

#### **Federal Goal 5**

### **CHARACTER EDUCATION**

#### **Key Theme: Character/Ethics Education**

**John Arceneaux, Extension Associate (Character Education and 4-H Foundation), 4-H Youth Development, LSU AgCenter**

#### **Program Description**

The Louisiana character education program is in its seventh year. The major parts of the program are providing quality materials and resources and providing training for those who implement the program across the state. Adults and youth are trained to present our character education materials in schools, after school programs, and other settings outside of school. Schools and community organizations are encouraged to allow older youth to serve as character teachers for younger youth.

The success of the program lies in the diversity of groups served, positive behavioral changes occurring, the number of 4-H and non-4-H members reached, the involvement in great numbers of school personnel and community volunteers, development of needs-specific educational materials, diverse community collaborations, legislative and gubernatorial support and funding, limited funding from out-of-state sale of materials, youth serving as mentors and trainers and youth reaching out to adults. Each of Louisiana’s 64 parishes has a character education coordinator. Public school districts, as well as some private and parochial schools, use 4-H character education materials. Many schools where the program is implemented also have an on-site coordinator.



The program provides research-based educational materials, guest speakers, consultants and train-the-trainer sessions for schools, workplaces, sports programs, prisons and probation organizations, governmental agencies, youth development organizations and other groups, and individuals interested in youth and character development. The program began focusing first on creating classrooms of character, then schools of character, and is now providing assistance to establish communities of character. Collaborators are encouraged to involve youth in teaching other youth and adults. The program is delivered through 4-H clubs, schools, and community partners.

Educational materials used were developed by 4-H personnel assigned to the character education program. Activities are based on six universal character traits--trustworthiness, respect, responsibility, fairness, caring, and citizenship. A seventh component, decision making, is also focused on in the program. The materials are designed for youth or adult instructors, tied to the Louisiana Content Standards Benchmarks, and are age specific for pre-k to 12th grade youth. All descriptions of materials also apply for those designed for sports, workplace, and both youth and adult prison and probation populations.

Educational materials used consist of:

1. *A Tool Box of Ideas for Helping Elementary Students Exercise Character in Schools and A Tool Box of Ideas For Helping Secondary Students Exercise Character In Schools*: Provide successful ideas and activities for integrating character education into school programs.
2. *Cafeteria Character, School Bus Character, Student Character and School Staff Character*: Individual summaries of the behaviors expected of students and school personnel.
3. *Exercising Character In Schools and Exercising Character in the Community*: Two sets of activity-based lessons for each pillar of character and decision making in kits designed for five age groups: ages 4-6, 6-9, 9-11, 11-13, and teenagers.
4. *Sports Ethics Handbook*: Handbook for P.E. classes, school sports, and community sports programs.
5. *Workplace Ethics*: Activity-based lessons for high school and workplace settings.
6. *Showing Character*: Activity-based lessons for use in the livestock exhibiting community.
7. *A Guide For Getting Your Community Involved In Character Education*: A manual for helping communities organize and establish active character coalitions.

*Principal's Principles*, a curriculum piece for use within the state, provides a brief statement about building good character and following character traits to be read by the principal every school day, was provided to school principals for the 2000-2001 and 2001-2002 school years. A new, two-volume edition was provided to every school superintendent and every principal in the state for the 2003-2004 school year.

A pilot character education evaluation project has been developed. It will be implemented during the 2003-2004 school year. A full evaluation is scheduled for 2004-2006.

A growing number of community collaborations in 2002-2003 have allowed us to broaden and diversify our audience.

- Head Start programs, community recreational sports programs, LSU Athletic Department, LSU Shreveport Department of Continuing Education
- Police departments - city, parish and state;
- Drug courts - juvenile and adult
- Workplaces, chambers of commerce, civic organizations - youth and adult
- Governor's Office program support. Governor funded \$25,000 Character Education Awards for Educators from his salary
- Louisiana Legislature provided \$300,000 funding for character education
- Louisiana National Guard Youth Challenge Program
- Louisiana Department of Education, Louisiana Department of Public Safety and Corrections, Louisiana Workforce Commission, Louisiana School-to-Work Office and regional consortiums, Louisiana Network of Health and Safety Stakeholders Coalition, Louisiana Safe and Drug Free Communities - state, regional and parish personnel
- Louisiana State Troopers Foundation youth summer camp

### **Program Impact**

Program results include reaching traditional and non-traditional 4-H audiences; diversity of groups served; positive behavioral changes occurring; development of needs-specific educational materials; diverse community collaborations; legislative and gubernatorial support and funding; minimal funding through the out-of-state sale of materials; youth serving as mentors and trainers, youth reaching out to adults, and the increasing demand for services, materials, and collaborations.

For the 2002-2003 school year, 66 public school systems, private schools and home-school groups participated in the program. Through the school initiative, a total of 359,185 individuals were reached: 3,623 adult instructors, 3,274 youth instructors, 182,665, students and an additional 49,106 outside the classroom. Principal's Principles were received by 120,517 individuals.

### **Source of Funds**

State and Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: Louisiana only

## **Federal Goal 5**

### **COMMUNITY LEADERSHIP AND ECONOMIC DEVELOPMENT**

#### **Key Theme: Leadership Training and Development**

**Karen Overstreet, Professor, (Leadership, Volunteer Development), School of Human Ecology, LSU AgCenter**

#### **Program Description**

Community Leadership & Economic Development (CLED) is a collaborative effort of the LSU AgCenter, Association of Louisiana Electric Cooperatives, local utilities, and local governing bodies. Although CLED has a formal curriculum, it is modified to meet the needs of the clientele in parishes offerings. The program is conducted on request of a local steering committee. Once interest is expressed, an extension faculty member meets with a core group to help them develop their steering committee and outreach efforts. The steering committee is representative of the community. Each steering committee member is then responsible for identifying individuals and groups to be included. Public notices of the program are also part of the recruiting process.

Each of the CLED programs conducted thus far created working committees to address the identified issues. For example, Livingston parish CLED identified four major issues: growth and development, image, infrastructure and collaboration. Franklinton identified education & youth, jobs & industry, downtown revitalization and building a reservoir with retirement community. During the 10-week class period, committees looked at the current situation, developed long range plans, identified other potential resources and created an action plan. Plans were presented to elected officials, media and other invited guests at the last class session.

#### **Program Impact**

Some of the committees continue to meet as a whole while most have joined forces with existing community groups which is the goal of the program. The infrastructure committee became part of a local group working to get a new interchange from I-10 which has now been approved. The reservoir committee continues to meet with a larger group and planning is still being done. Downtown revitalization organized some joint activities that are still being incorporated. It is still too early to determine the major impacts of the program. However, the Community Leadership and Economic Development program was selected by the Kellogg Foundation for a best practices study.

#### **Source of Funds**

State, Federal (Smith Lever 3 b, c), local communities

## **Scope of Impact**

Multi-state: Impact confined to Louisiana

## **Federal Goal 5**

### **ECONOMIC DEVELOPMENT-COMMUNITY DEVELOPMENT**

#### **Key Theme: Economic Development**

**Deborah Tootle, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

In 1998, the LSU AgCenter and the Louisiana Cooperative Extension Service (LCES) conducted a series of forums in each parish in the State. In these forums, Louisiana residents in 59 of the State's 64 parishes identified economic development as one of their most pressing issues.

Participants specifically asked for assistance in the following areas:

- Business development, retention and expansion
- Workforce development
- Civic engagement and leadership development
- Natural resource and heritage based tourism development

In response, the LCES assembled a new economic development initiative team to identify strategies and educational programs to address these issues. By the summer of 2001, the LCES reassigned eight (8) county and extension agents as Community Economic Development (CED) area agents. The CED area agents work as a team with faculty in the Department of Agricultural Economics and Agribusiness to provide community and rural economic development education, technical assistance and facilitation services to the Louisiana public. CED area agents are in the process of completing an educational specialization (15 hours) of graduate work in community and rural development. Six CED area agents have completed the specialization process and one more will be finished at the end of the Spring Semester, 2004. The mission of the CED Team is to strengthen communities and facilitate rural economic development. The CED Team is concentrating on the processes of (a) civic engagement and leadership, and (b) rural economic development, with an emphasis on small and/or natural resource based business development.

During the past year, the LSU AgCenter has joined Mississippi and Arkansas in a tri-state rural development initiative and partnership with the Foundation for the Mid South which focuses on comprehensive community and rural development in the Mississippi Delta. This is a long-term (10-15 years) project that is designed to build capacity in one of the most poverty stricken regions in the United States.

The CED Team works with other LSU AgCenter faculty as well as with state and local government agencies and non-profit organizations. The CED Team works closely with the Southern Rural Development Center and is networking with counterparts throughout the south.

### **Program Impacts**

- Louisiana residents are learning about current social and economic conditions in their communities.
- Louisiana residents are gaining an increased understanding of economic development alternatives (i.e., moving beyond smokestacks).
- Community members are developing strategic plans for community development.
- Community members are beginning to implement components of strategic plans.
- Residents in the tri-state area of Mississippi Delta are beginning the processes of local capacity building and sustainable development.

### **Source of Funds**

State, Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: Approximately one half (50%) of the Louisiana program can be attributed to shared information and training from the states of Arkansas, Mississippi, Florida, Missouri, Kentucky, Oklahoma, South Carolina, Tennessee and Wisconsin. A total of 4.8 state and parish FTEs were devoted to the Economic Development Initiative. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-state effort = [(50%) x (4.8 FTEs) x (\$80,136)] = \$192,326.

Multi-functional: Approximately one quarter (25%) of this program is based on data analysis and other research findings. A total of 4.8 state and parish FTEs were devoted to the Economic Development Initiative. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-function effort = [(25%) x (4.8 FTEs) x (\$80,136)] = \$96,163.

### **Federal Goal 5**

## **ECONOMIC DEVELOPMENT – LEADERSHIP AND TRAINING**

### **Key Theme: Economic Development**

**Deborah Tootle, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

## Program Description

In recent years, rural development practitioners have come to realize that traditional economic development strategies are generally inadequate in today's fast-paced economy. Most of the traditional models are either based on urban models or do not take into account today's spatial division of labor. Traditional economic development models typically rely on the identification of perceived needs in rural areas and concentrate on importing these "needed" resources into the rural area. A more realistic approach for today's economy is to build local capacity. Most rural communities have unique resources (i.e., land, labor, talent, existing economic activity, natural resources) on which a viable local economy can be built.

Participants in LSU AgCenter community forums, advisory boards, and local stakeholder meetings indicated they need assistance in developing their social, civic, physical and entrepreneurial infrastructures for economic development. In the past year, the LSU AgCenter and LCES provided educational civic engagement and leadership programs and workshops (Strategic Adult Leadership, Community Leadership and Economic Development, and Take Charge) throughout the state. CED area agents, along with county agents, helped communities implement strategic plans developed in these workshops through follow-up meetings with local working groups organized during the workshops.

## Program Impact

- More than 70 community leaders and volunteers in West Carroll Parish developed and used skills in community collaboration and cooperation. Together, with \$609,000 from state grants and \$1.4 million from the North East Education Development (NEED) Foundation and donated work, they built the Thomas Jason Lingo Community Center in Oak Grove. This multipurpose facility will serve as a civic and education center, and will house the NEED Foundation, the West Carroll Parish office of the LSU AgCenter, and an LSU AgCenter rural development outreach center as well.
- Fifty-five community leaders participating in Community Conversations in West Carroll Parish learned about the rural development opportunities associated with the organization of an e-village and regional resource center.
- More than 1,500 volunteers in St. Bernard Parish worked together to raise over \$160,000 and contributed over 4,500 hours of volunteer service to create a 12,000 square foot community playground and a 200 seat amphitheater in Chalmette's Torres Park. The 18-month project is the largest community development project completed by St. Bernard Parish.
- Residents in communities surrounding Fort Polk learned about its impact on the Louisiana economy. Fort Polk has the second largest payroll in the State. Community members organized an effort to protect the military base from realigning or closing in 2005.
- Community members of Vernon Parish organized a marketing team for the parish. The team is learning how to market their community to business and industry and putting together marketing materials.

- Almost 300 educators in technical colleges in Lake Providence, Tallulah and Winnsboro and two parish school systems in North Louisiana learned critical leadership skills in meeting management, conflict resolution, effective parent-teacher conferences, and communications.
- Nearly 75 community members in Claiborne and Vernon parishes learned and adopted parliamentary procedure as a means of conducting parish and community meetings.
- More than 90 residents of the towns of Dubach, Cullen, New Roads, and Thibodeaux participated in the CED Take Charge civic engagement program. They developed and began implementing strategic plans for improving economic and social well-being in their communities. Among other things, Dubach is in the process of developing a retirement center and has received a \$2,500 grant to promote retirement development. Cullen has been active in getting its unwed mothers into post secondary education. New Roads is promoting tourism as a means of attracting new residents to their community. Thibodeaux participants earned 24 hours in continuing education credits for leadership skills.
- Over 250 Cottonport residents gained information on ways to improve their community while participating in the Governor's Small Towns Program.
- Community volunteers in the 12-parish South Central Region realized the need for civic engagement and expanding community volunteer networks and resources. They developed a strategic plan for training additional volunteers in a Master Volunteer program.
- Over 400 adults and youth have attended meetings and special events in Claiborne Parish on the Sparta Aquifer surface water issues. They learned about water conservation, irrigation, water quality and its impact on economic development. As a consequence, several different groups in Claiborne are working on water conservation and recreational activity projects.
- Twenty-five Ouachita Parish business owners completed a 10-week Community Leadership and Economic Development course. They learned about economic conditions and trends in Ouachita Parish and practiced leadership skills. They developed a strategic plan for economic development.
- Twenty-two Master Gardeners in South Central Louisiana learned meeting management and leadership skills.
- Forty-one Franklinton Parish residents learned community development process skills in a Community Leadership and Economic Development class. As a consequence, the downtown revitalization committee began to clean up vacant store fronts and is researching the possibility of establishing a farmer's market near the town square. They are holding quarterly contests to recognize the business with the most attractively decorated exterior based on the themes selected by the committee.

### **Source of Funds**

State, Federal (Smith-Lever 3 b, c)

## **Scope of Impact**

Multi-state – Approximately one quarter (25%) of the teaching materials and information used in the Louisiana program can be attributed to information and training from the states of Mississippi and Missouri. A total of 6.76 state and parish FTEs were devoted to the Economic Development: Building Local Capacity Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-state effort = [(25%) x (6.76 FTEs) x \$80,136] = \$135,430.

Multi-functional – Approximately one fifth (20%) of the information used in this program is based on experiment station findings. A total of 6.76 state and parish FTEs were devoted to the Economic Development: Building Local Capacity Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-function effort = [(20%) x (6.76 FTEs) x (\$80,136)] = \$108,344.

## **Federal Goal 5**

### **ECONOMIC DEVELOPMENT-PROMOTING BUSINESS**

#### **Key Theme: Economic Development**

**Deborah Tootle, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

In LSU AgCenter community forums and stakeholder meetings, participants identified business development, retention, and expansion as a major issue. Many rural communities have been hard hit by the closing and relocation of manufacturing plants and the subsequent closing of local businesses. Many small business start-ups fail within a very short time. Residents of rural areas report difficulty in obtaining assistance for enterprise development. Although there are many opportunities for small business development in urban areas through the Small Business Assistance Centers, the Louisiana Department of Economic Development and universities, many rural residents wanting to go into business are not yet ready to seek help from these sources. The CED Team has assembled a very basic, elementary level entrepreneurship program (based on the Exploring Entrepreneurship program developed at the University of Tennessee) that begins with whether or not someone should be in business and progresses through the development of a business plan. Once clientele have completed the entrepreneurship workshop, they are prepared to obtain assistance from other State sources. In addition to the entrepreneurship program, CED Team members, along with county and extension agents are helping producers and natural resource managers understand and incorporate financial management and alternative enterprise development into their operations.



## Program Impact

- Residents in rural areas learned about entrepreneurship by participating in entrepreneurship workshops organized by CED and partners. Nearly 50 potential entrepreneurs and entrepreneurs from St. Charles and Tangipahoa parishes have participated in a new entrepreneurship training program “Starting A Business... Is It For You?” and have learned what an entrepreneur is, whether entrepreneurship is an appropriate vocation, how to write a business plan, time management principles, how to evaluate business ideas, financial management and finding resources. Displaced homemakers in NE Louisiana are learning how to start their own businesses. Southern Mutual Help Association in Iberia Parish is partnering with CED in providing entrepreneurship training to local shrimpers.
- Twenty-eight parishes in Louisiana have been declared Federal Renewal Communities. More than 650 business owners in the NW and Central regions of the state learned about the Renewal Community federal tax incentive program through CED programs. Many of these business owners, such as a veterinarian in NW Louisiana are taking advantage of the federal tax credits offered. The veterinarian and his partner are completing a \$110,000 expansion to their clinic and are getting a \$77,000 tax deduction. During the construction phase of the addition, 30 local construction workers have been employed and one full time employee has been hired by the veterinary clinic.
- Beef cattle producers in SW and Central Louisiana are learning new management and alternative marketing practices. Of the 550 producers learning these new practices, 50 have adopted and used these alternative marketing practices, decreasing their marketing costs and increasing profitability. Goat producers in North and Central Louisiana are looking at adopting a similar program.
- Members of the secondary wood products industry in NW Louisiana participated in a focus group to identify barriers and opportunities facing the industry in Louisiana.
- More than 300 farmers and business owners throughout the State (including 50 limited resource farmers) learned about rural development opportunities within the 2003 Farm Bill and the availability of USDA funding for value-added product development. Community leaders, elected officials, and DOTD are working with LSU AgCenter to identify and develop value added uses for cotton gin trash and other agricultural refuse.
- Over 100 business owners in North Louisiana learned about e-business through the Delta E-Commerce program housed at LA Tech. Delta E-Commerce assists rural businesses in developing websites and provides free internet service for one year. A third of those learning about the Delta E-Commerce program are now marketing their businesses electronically.
- Nearly 100 fruit and vegetable farmers in North Louisiana learned new marketing strategies to increase their agricultural sales.
- The media in SE Louisiana participated in the “Strawberry Industry Media Tour” and generated publicity for Louisiana strawberry producers through 4 news articles, 3 television shows and 1 radio show.

## Source of Funds

State, Federal (Smith-Lever 3 b, c)

## Scope of Impact

Multi-state: Nearly two-thirds (60%) of the materials and information used in the Louisiana program can be attributed to information and training from the states of Mississippi, Missouri, Tennessee and Arkansas. A total of 3.86 state and parish FTEs were devoted to the Economic Development: Business Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-state effort =  $[(60\%) \times (3.86 \text{ FTEs}) \times (\$80,136)] = \$185,595$ .

Multi-functional: Approximately one fifth (20%) of the information used in this program is based on experiment station findings. A total of 3.86 state and parish FTEs were devoted to the Economic Development: Business Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-function effort =  $[(20\%) \times (3.86 \text{ FTEs}) \times (\$80,136)] = \$61,865$ .

## Federal Goal 5

### ECONOMIC DEVELOPMENT-TOURISM

#### Key Theme: Economic Development

**Deborah Tootle, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### Program Description

Tourism emerged during the 1998 LCES community forums as an economic development strategy with which communities needed assistance. Tourism, with a particular emphasis on natural resource based tourism, continues to be a major rural development strategy for rural areas in this state. In the past year, the CED Team has provided technical assistance and educational programming through a variety of programming efforts and initiatives. Programming efforts include (a) Frontline Worker Training, a program which is designed to train front-line workers in the hospitality industry to interact positively with tourists and other visitors, (b) the First Impressions program, which is a visitor infrastructure awareness program that helps community members become aware of how their communities are perceived by outsiders, and (c) Natural and Cultural Resource Mapping, in which participants learn to identify and create an inventory of those resources in their communities that attract tourists. The CED Team has been instrumental in developing the Delta Outdoors and Wildlife Association and several agritourism ventures. CED is working with the Atchafalaya Trace Commission (Louisiana Dept. of Culture, Recreation and Tourism) to develop tourism based economic development opportunities

(including tax credits for tourism related businesses) in the southern part of the state. In addition, the CED area agents, along with county, extension, and Sea Grant agents provide seminars on tourism opportunities.

### **Program Impact**

- Approximately 50 landowners in NE Louisiana have increased their knowledge about economic development opportunities associated with natural resource based and recreational tourism. They organized the Delta Outdoors and Wildlife Association. The Association has conducted tours for other interested landowners and the press, and completed a marketing package with a web site, brochures, a trade show exhibit and video. Association members have participated in trade shows throughout the South. As a result of the increase in recreational activity, more than 100 Louisiana residents in Central and North Louisiana have increased the value of marginal farm lands or opened/expanded some form of business that is based on natural resource and recreational tourism.
- Farmers are becoming aware of the value of agritourism and learning how to diversify and set up profitable agritourism operations. Several new agritourism sites have opened up in the State. One of these farms, which until very recently had been a struggling dairy operation, is now a successful outdoor classroom for school field trips. It draws students from a 100 mile perimeter. This facility, which opened in the Fall of 2003, grossed approximately \$20,000 in its first two months of operation. Other farmers, including a dairy farmer in Ohio, have been contacting the LSU AgCenter for assistance with similar projects.
- The town of Gibsland in Bienville Parish formed a Farmers' Market. It opened in 2002 with 30 members and reported over \$6,000 in sales its first year. Eight members have been authorized by USDA to accept Farmers' Market Nutrition Program coupons for senior citizens. Coupons totaling \$1,600 were distributed in Bienville Parish. One third of the members report an increase in agricultural sales, with two of the members reporting selling over \$800 of produce in a day.
- Nearly 2,000 community leaders and members in 12 parishes throughout the state have learned the importance of a well maintained visitor infrastructure in attracting tourists, retirees and new businesses. In the past year, community leaders and members in 6 of these parishes have undertaken an assessment of their visitor infrastructure through the LSU AgCenter's First Impressions program. Community leaders and members in at least 4 of the 6 parishes have already begun to correct problems and make infrastructure improvements.
- More than 300 community leaders and elected officials (including Governor Kathleen Babineaux Blanco and her staff) learned principles and impacts of agritourism, ecotourism and the role of natural resource based amenities in attracting retirees and other visitors through conferences and tours throughout the State.
- Community members in 19 parishes in Central and North Louisiana have mapped natural resource assets in their parishes; most of these parishes are using this

information to put together publicity materials to attract visitors to their communities and organize heritage tours.

- In East Carroll Parish, 15 diverse community leaders have begun working with the Kellogg Foundation in using cultural tourism to promote economic stability.
- Several hundred community volunteers collaborated to organize a number of festivals and cultural events that brought in significant tourist dollars in communities throughout the state. These included the Daylily Festival in Vermilion Parish, the Butterfly Festival in Claiborne Parish, the Catfish Festival in Winnsboro, and Poverty Point Trade Days in Delhi.
- Rural communities are becoming more aware of national programs, such as the Main Street Program, to revitalize downtown areas. Volunteers and professionals from Union, Lincoln and Morehouse Parishes worked together to help Madison Parish become a Main Street Community. In Vermilion Parish, the Main Street coordinator in Abbeville wrote and received a \$100,000 grant for renovation of an old movie theater. Claiborne Parish historic district committee members received training and accreditation as a certified community. The town of Homer adopted an ordinance preserving the downtown district.
- Rural communities are becoming more aware of the potential for national and state Parks and Heritage Areas to bolster their natural resource and culturally based tourism efforts. In 2001 over 500 community leaders and members in the 13 parishes in the Atchafalaya Trace Heritage Area identified economic development opportunities and developed strategic plans for developing ecotourism. Most of the parishes are now in the process of implementing these strategic plans. Claiborne Parish (Lake Claiborne State Park) is marketing tourist attractions through roadside kiosks and publicity materials. Vermilion Parish (Palmetto State Park) is developing birding trails to tie in with the Greater Gulf Coast Birding Trail, which will eventually stretch from Texas to Florida.

### **Source of Funds**

State, Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

Multi-state: Approximately two-thirds (67%) of the information and materials used in the Louisiana program can be attributed to information from many other states. The bulk of the information comes from Mississippi, Oklahoma and Wisconsin. A total of 3.86 state and parish FTEs were devoted to the Economic Development: Tourism Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-state effort =  $[(67\%) \times (3.86 \text{ FTEs}) \times (\$80,136)] = \$207,248$ .

Multi-functional: Approximately one quarter (25%) of the teaching materials and information used in this program is based on experiment station reports. A total of 3.86 state and federal FTEs were devoted to the Economic Development Tourism Program. With the dollar equivalent

of 1 extension professional at \$80,136, the dollar value of the multi-function effort = [(25%) x (3.86 FTEs) x (\$80,136)] = \$77,331.

## **Federal Goal 5**

### **ECONOMIC DEVELOPMENT-WORKFORCE PREPARATION**

#### **Key Theme: Economic Development**

**Deborah Tootle, Associate Professor, Department of Agricultural Economics and Agribusiness, LSU AgCenter**

#### **Program Description**

Louisiana residents participating in community forums, stakeholder meetings and advisory groups repeatedly report the need for workforce preparation training for both adult and youth audiences. These observations are reinforced by a national USDA study on rural manufacturing across the United States that found rural employers are experiencing considerable difficulty in hiring and maintaining a suitable workforce. Employers in the Mississippi Delta states report that employees and prospective employees do not have an understanding of the basic workforce skills and appropriate workplace behaviors that enable them to function in the workforce. To address this problem, the CED Team works with a wide array of partners and clients (other LSU AgCenter faculty, colleges, parish school systems, major employers, State and local governments) to teach basic, appropriate workforce skills and behaviors.

#### **Program Impact**

- Almost 1,400 adult and youth participants throughout the state have learned about ethics and appropriate workplace behaviors as well as skills in exploring careers, customer relations, working with difficult people, communication, team building, professional development, and management.
- Federal, state and local partners in Lincoln Parish have developed the “Leap Into Work” workforce training program. This program targets chronically unemployed young adults between the ages of 17 and 32.
- The town of Cullen has entered a partnership with the Bossier Parish Community College to participate in the MOMS program which provides free tuition, books, child care and transportation to unwed mothers living in subsidized housing. Twenty-seven unwed mothers in the Cullen area are now enrolled in post-secondary education as a result of the MOMS program.
- 4,300 4-H members throughout the state learned how to develop and market a retail product.

## Source of Funds

State, Federal (Smith-Lever 3 b, c)

## Scope of Impact

Multi-state: Approximately two-thirds (67%) of the information and materials used in the Louisiana program can be attributed to information from many other states. The bulk of the information comes from Mississippi, Oklahoma and Wisconsin. A total of 3.86 state and parish FTEs were devoted to the Economic Development: Tourism Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-state effort =  $[(67\%) \times (3.86 \text{ FTEs}) \times (\$80,136)] = \$207,248$ .

Multi-functional: Approximately one quarter (25%) of the teaching materials and information used in this program is based on experiment station reports. A total of 3.86 state and federal FTEs were devoted to the Economic Development Tourism Program. With the dollar equivalent of 1 extension professional at \$80,136, the dollar value of the multi-function effort =  $[(25\%) \times (3.86 \text{ FTEs}) \times (\$80,136)] = \$77,331$ .

## Federal Goal 5

### HOME GARDENS AND GROUNDS

#### Key Theme: Home Lawn and Gardening/Urban Gardening

**Thomas J Koske, Professor, Department of Horticulture, LSU AgCenter**

#### Program Description

Random sampling of stakeholders statewide in town meetings indicated a priority to receive Extension LCES help and advice in home gardening to better succeed against the elements in home landscaping and vegetable production. County agents in urban/suburban parishes are swamped with home horticulture calls and demands. Some agents report 75% of telephone calls received in the growing season relate to home horticulture. Some people wish to receive in-depth horticultural study beyond production agriculture as well as an opportunity to provide a community service in that area. A [louisianalawnandgarden.org](http://louisianalawnandgarden.org) Web site was developed and regularly updated to enhance accessibility to AgCenter consumer horticulture information.

The Louisiana Cooperative Extension Service developed and implemented the recurring volunteer education and service consumer horticulture program called Louisiana Master Gardeners (LMG). The program follows the traditional Master Gardener format patterned after that of most states. This support group enhances and extends the efficacy of the AgCenter's educational effort for home horticulture clients. The AgCenter-generated program interacts with Habitat for Humanity, garden foundations, native plant societies, schools, food banks, local

master gardener associations, and the Master Gardener programs of other states.

### **Program Impact**

Louisiana has an estimated 394,877 home vegetable gardens with a projected annual production value of \$118,463,100. There are also countless home landscapes requiring maintenance and development. Most of these gardens/landscapes are found in areas enhanced by LMG programming since 37% of them are found in the three major metro areas of the state. In FY 2003, the LMG program trained 249 new volunteers and retained 782 senior LMGs. These volunteers gave 39,035 hours of service [18.7 paraprofessional equivalents to their parish home horticulture programs valued at \$645,639 (\$16.54/hour)].

LMGs in urban /suburban areas significantly assisted with local extension education efforts and with area garden shows that attracted about 19,000 home owners in search of garden information. Seventeen LMGs in St. John parish planned, organized, and conducted their local Spring Garden Show for local business viability. Most LaTerre LMGs (45) have participated in at least one community service project, but all LMGs are also targeted for advanced gardening knowledge and personal development. LaTerre LMGs coordinated a gardening seminar series at the Spring Garden Show that promoted AgCenter recommended BMPs to 400 local residents while St. Tammany's 32 LMGs planned and conducted a plant show with BMP seminars for 1,500 local residents. LMGs in Northwest Louisiana hosted a garden tour to demonstrate BMPs to 1,100 participants and they produced a fall garden workshop for 129 local residents. NW LMGs have been producing a 30 minute, weekly educational garden show delivered twice a week on cable television to the ARK-LA-TEX region.

### **Source of Funds**

State, Federal (Smith-Lever 3 b, c) funding for professional LCES staff; volunteers pay for training materials and pledge volunteer program hours. LMG associations generate grant money for their parish AgCenter programming efforts.

### **Scope of Impact**

The ideas of AgCenter's LMG program come from regional and nationwide master gardening programs, conferences, and workgroups (90%). Training materials were designed from southern region master gardening programs and adapted for Louisiana use (75%). A total of 27.9 FTEs of professional staff time was expended in home gardens and home grounds-lawn programming.

Multi-state: Of the 27.9 FTEs, 75% (20.9 FTEs) was dedicated to home lawns and gardens work through the LMG program representing multi-state influenced work. The dollar equivalent attributable to multi-state activities is \$1,674,842 (20.9 FTEs x \$80,136 per FTE).

Multi-function: Multi-function work of research and extension collaboration in consumer horticulture, both instate and between southern states, is 50% or 13.9 professional FTEs. This is equivalent to \$1,113,890 (13.9 FTEs x \$80,136 per FTE).

## **Federal Goal 5**

**Title: Family Economics**

**Key Theme: Family Resource Management**

**Jeanette Tucker, Associate Professor (Family Economics), School of Human Ecology, LSU AgCenter**

### **Program Description**

Research indicates that almost one-fifth of all Louisiana families and one-third of all children live in poverty. The median income for families is 76% of the national average and many families are transitioning from public assistance. Many Louisiana families are living on the “financial edge” with high debt loads and little or no savings. The average cardholder has 11 credit cards. Average total credit card debt is over \$9,000. Louisiana’s high bankruptcy rates suggest a great need for improving personal financial literacy. Today’s teenagers, in adulthood, will be required to take more responsibility for managing their finances than people of any previous generation; yet, Louisiana high school seniors scored only 47.3% on a nationwide test of personal financial literacy. There is a critical need for homebuyer education, since Louisiana has a low rate of home ownership and many lending institutions require homebuyer education.

Over 200 Louisiana citizens completed a needs assessment to determine critical financial education needs. Parish clientele were queried individually, and in group settings to collect input regarding client needs and program development. Local advisory councils identified and prioritized issues. Family Resource Management (FRM) specialization agents shared input from clientele and stakeholders to guide program direction and development. Specific problems that have been identified include: Financial literacy for youth; debt reduction and credit management; basic budgeting and money management skills; and issues of poverty and working poor.

LSU AgCenter Family Resource Management Faculty partnered with the Louisiana Jump\$tart Coalition for Personal Financial Literacy; this group was instrumental in the initiation, introduction and passage of Act 296 in 2003. This state legislation requires Free Enterprise, a required course for high school graduation, to include instruction in income, money management, spending and credit, and saving and investing, beginning in the 2004-2005 school year.

To build the capacity of Free Enterprise teachers to deliver this information to their students; AgCenter FRM faculty conducted 30 separate six-hour training sessions that reached 200 Free



Enterprise teachers. The National Endowment for Financial Education's High School Financial Planning Program® provided the basis for the workshops. Louisiana Jump\$tart Coalition partners provided teacher stipends, and shared technical information and resources.

Almost 27,000 Louisiana citizens participated in face-to-face programs addressing family resource management issues. Most of these clients were low to moderate income. Issues addressed included debt reduction and credit management, transitioning from public assistance to self-sufficiency, budgeting, saving, goal setting, and identity theft. Extensive mass media programming efforts including television, radio, newspaper and newsletters were also utilized.

Teams of extension agents and local partners conducted Extension's 12-hour Your Path to Home Ownership program in four parishes.

### **Program Impact**

High School Financial Planning Program workshops reached 200 Free Enterprise teachers who will, in turn, reach approximately 20, 500 students. Participants' self-assessment of their preparation to teach high school students about money management increased 31% from 3.4 before the session to 4.5 after completing the session. "I now have confidence to teach financial planning," was a recurring statement by workshop participants. Pre- and post-test evaluations are being conducted on a sample of students taught by workshop participants to determine program impact on students.

As a result of participating in AgCenter debt reduction and credit management programs clients obtained credit reports and worked to clear discrepancies and improve their credit scores. A total of 347 of 870 (40%) soldiers enrolled in a debt management program reported reducing their debt.

One limited resource client credited the program with saving her from bankruptcy. PowerPay® debt reduction analysis on two clients saved them over \$3,000 each. Surveys of a sample of program participants revealed the following intentions:

- 58 of 59 (98%) participants indicated they will make a plan of when and how to use credit
- 139 of 142 (98%) participants indicated they will comparison shop for the best available sources of credit
- 156 of 218 (72%) participants indicated they will check their credit reports and correct any problems

Over 20,000 individuals and families were impacted by face-to-face AgCenter programs on goal setting, budgeting, and financial management. Thirty-seven volunteer mentors were also recruited and trained. At least two homeless families were moved off the streets and into stable housing as a result of Family Resource Management programming efforts. One participant reported moving from public assistance to self-sufficiency. A survey of 870 first time military personnel who completed an 8-hour financial management class revealed that 55% had learned

to manage their finances and become financially independent. A total of 50 of 155 (32%) clients who participated in Identity Theft prevention programs indicated they had checked their credit reports for identity theft; an additional 15 of 155 (10%) reported they had had their social security number removed from their driver's license.

Surveys of a sample of program participants revealed the following intentions:

- 137 of 141 (97%) participants indicated they will make and use a spending plan
- 90 of 114 (90%) participants indicated they will keep track of their spending for one month
- 129 of 133 (97%) participants indicated they will make changes so they can pay monthly bills on time
- 293 of 313 (94%) participants indicated they will set financial goals and priorities
- 141 of 178 (90%) participants indicated they will build a fund for unexpected expenses

In FY03 the Your Path to Home Ownership program taught 189 people how to better manage their finances, overcome their personal obstacles to home ownership, avoid costly mistakes during the home buying process and protect their investments. In prior years this program helped over 744 prospective homebuyers. The majority are low- or moderate- income households. At least 16 families have bought homes this year as a result of this program. One prior participant was selected by Habitat for Humanity to purchase a Habitat built home.

**Source of Funds:** State, Federal (Smith Lever 3 b, c)

**Scope of Impact:** In FY03 10.21 FTEs were spent on family resource management education resulting in 26,991 contacts. Based on an FTE cost of \$80,136, the total cost of the program was \$818,188.

Multi-state: Family Resource Management faculty collaborates with and has shared programs with extension educators and financial educators across the nation. Presentations were made to the Mississippi Financial Literacy Teacher Institute, HSFPP State Coordinators Training and Association for Financial Counseling and Planning Education. Collaborative programs are underway with Arkansas and Mississippi. It is estimated that 40% of the program effort is attributable to multi-state work in the acquisition and sharing of information. The dollar equivalent of this share of the program is \$327,275 (10.21 FTEs X \$80,136 x .40).

Multi-function: It is estimated that 30% of the program effort is attributable to collaborative work between research and extension in recommendations, curriculum development, agent training and presentations to clientele. The dollar equivalent of this share of the program is \$245,456 (10.21 FTEs x \$80,136 per FTE x .30).

## **Federal Goal 5**

### **PARENTING SKILLS EDUCATION**

#### **Key Theme: Parenting**

**Diane D. Sasser, Associate Professor (Family Development), School of Human Ecology, LSU AgCenter**

#### **Program Description**

Input from program stakeholders gleaned from statewide strategic planning process, advisory committees, and personal contacts indicated a need for parenting skills education particularly for parents with young children, single and divorcing/divorced parents, and parents with other risk factors.

Research data and Louisiana demographic statistics were consulted to design and dedicate programming in response to needs cited by stakeholders. The following audiences and key factors which needed to be addressed were identified:

- Scientific evidence indicates that the first 36 months of a child's life is the most profound time of opportunities for optimum brain development. Negative circumstances and environments will result in problems such as poorly functioning brains, poor school performance, and difficulty processing social cues all of which are characteristics associated with criminal behavior. Louisiana leads the nation in the rate of incarceration per capita. This prompted attention to audiences with children less than three years of age and parents who were in prisons and/or parole.
- Statistically, food stamp and FITAP recipient families have low educational attainment and consequently children in these families often do not receive enriched learning environment, proper nutrition, and appropriate caregiver interactions due to lack of knowledge of the importance of early brain development. The children therefore adopt the behaviors they see modeled and follow the same circumstances into adulthood unless they receive intervention. A collaborative effort with Louisiana's Department of Social Services helped to identify target audiences with low educational levels and low income.
- Fifty percent of marriages fail. Sixty percent of these failed marriages include children. These children potentially are in the middle of their parents' conflicts. Statistics indicate it is the conflict itself that has lasting effects on the children rather than the divorce itself. Children who experience difficult relationships tend to pattern their relationships in the same manner. Parents who can communicate and co-parent successfully can save their children's mental health. Court systems in specific

parishes cooperated in identifying parents who could potentially be heaping their conflicts upon their children.

Louisiana Cooperative Extension Family and Consumer Science educators in 25 parishes in Louisiana reported organized efforts to improve parenting skills, promote brain development in children aged zero to three, and improve parent-child and parent-to-parent communications thereby hopefully reducing the rate of incarceration of these children in adulthood, improving the children's chances for success in schools, and reducing the number of families on financial assistance. Parenting skills education promotes positive parenting and child health and development thereby preventing poor childhood outcomes. Many of the results will not be available for several years, but short term results were noted.

Family and Consumer Science educators conducted a series of parenting skills education lessons about a variety of effective parenting techniques. Audiences for these workshops included parents who are incarcerated, military families, divorcing/divorced parents, parents transitioning from welfare to work and those referred by the judicial system. Workshop information was delivered using a variety of teaching techniques including role play, interactive experiences and group discussions. The information delivered was enhanced with educational literature and "homework" assignments. Follow-ups with newsletters and additional opportunities for learning were offered.

### **Program Impact**

It is estimated that over 6,000 parents gained knowledge in areas such as child development, appropriate parenting styles and child guidance and effective communication.

- 94% (2,143 of 2,276) of participants learned information and skills to help their children's brain development.
- 89% (1,340 of 1,501) parents learned the appropriate parenting styles to guide their children's behavior. They learned child behaviors that are expected for their children's ages so that their understanding of expected behaviors could lower their stress and frustration levels. Becoming equipped with age-appropriate guidance techniques helped to achieve the desired child behaviors.
- 93% (1,450 of 1,556) single parents, divorcing/divorced parents, and incarcerated parents learned effective communication skills to help in co-parenting their children in cases of divorce and absentee parents. This helped to model communication to children thereby enabling children to communicate their thoughts and feelings reducing children's frustrations, fears and misunderstandings and improving their chances for positive relationships.
- 94% (1,997 of 2,125) parents reported plans to implement new skills and information gained to promote their children's potential brain development. This included employing activities that would help a child's development by stimulating the child's brain.
- 94% (1,105 of 1,176) pledged to adapt their parenting skills to a more democratic style of parenting, the style noted by research as most effective.

- 94% (1,539 of 1,644) of single, divorced/divorcing parents indicated they would communicate more effectively with their children and with the adults in their children's lives.
- Conflict was reduced for 36 children who were part of divorcing families in Jackson & Bienville parishes. 27 parents reported positive communication with children when using "I messages".

### **Source of Funds**

State, Federal (Smith-Lever 3 b, c)

### **Scope of Impact**

The program's impact is confined to Louisiana. The majority of the information included in the parenting curriculum is specific to Louisiana residents.

In FY 2003, 7.95 FTEs were spent on parenting education. The dollar equivalent of the work is \$637,081 (7.95 FTEs x \$80,136)

Multi-function: Contributions from research counterparts including assistance in curriculum development, agent training, publications and presentations to clientele is estimated at 20% of the program FTEs. The dollar equivalent of multi-function work is \$127,416 (7.95 FTEs x \$80,136 x .20).

### **Federal Goal 5**

## **LEADERSHIP AND VOLUNTEER DEVELOPMENT**

### **Key Theme: Leadership Training and Development**

**Janet Fox, Associate Professor, 4-H Youth Development Department, LSU AgCenter**

### **Program Description**

One of the most pressing issues facing the United States and its youth serving organizations today is how to energize the development of our youth. The future of the nation, and the future of world civilization, will soon rest in the hands of today's youth. To become productive and contributing individuals who can be effective and proactive in determining the course of tomorrow's world, today's youth must develop positive leadership knowledge, attitudes, skills and aspirations. Preparing today's youth for their roles as tomorrow's leaders is a challenge we all face.

Louisiana 4-H is meeting the challenge of preparing tomorrow's leaders through a multi-faceted approach. Leadership training and development programs are set up to reach two distinct

audiences – youth and adults. Through these programs youth gain skills to serve in leadership roles. Through the 4-H volunteer and community/service learning programs, youth and adults put their leadership skills to work by serving others.

The Louisiana 4-H program is committed to developing leadership skills in both youth and adults. A variety of "high powered" leadership development programs and opportunities are offered on the district, state, and national levels. Club and parish 4-H organizations offer a variety of training topics identified to build leadership skills in youth. The State 4-H Leadership Conference, which involves over 200 youth, age 14 and older, is planned and implemented by teens focusing on developing leadership skills. On the national level, youth participate in the National 4-H Conference and the National 4-H Congress.

4-H members participate and serve in junior leader clubs, serve as 4-H leaders and serve as officers in 4-H clubs. Leadership opportunities are offered through statewide officer, committee membership, and membership on boards. Over 100 youth are fine tuning their leadership skills by serving on one of four statewide youth leadership teams including the Executive Committee, Fashion Board, Food and Fitness Board, and the Technology Team. These youth actively plan, implement, and evaluate subject-specific leadership programs for their peers. 4-H youth serve as representatives on the Louisiana 4-H Foundation Board, the Statewide 4-H Advisory Committee and statewide event planning committees.

Volunteers are the backbone of Cooperative Extension programs. The engagement of volunteers within Cooperative Extension is more critical than ever with budget cuts and reduced staffing. Training is a critical component of the Cooperative Extension Volunteer Program. The majority of Louisiana parishes offer leader training to equip adult leaders with the tools to work successfully with youth. This year, 6 area leader trainings were held across the state reaching over 600 4-H volunteers. The area leader trainings offered a variety of training topics from youth and adult partnerships to community service to parliamentary procedure to record keeping to fund raising to basic volunteer orientation. Approximately 125 leaders participated in State and Regional 4-H Leader Forums. The Louisiana 4-H Volunteer Leader Association was established and is now at over 50 members.

"I pledge: ... my hands to larger service..." Leadership development is being developed in youth through community service and service learning programs. 4-H members are encouraged to develop and practice skills to become helpful or useful in their club, community, country, and world. 4-H community service projects allow youth and adults to work together and to help others at the same time. The service learning program supports traditional community service with a focus on academic learning and curriculum.

### **Program Impact**

Over 2,100 Louisiana youth were enrolled in 4-H leadership projects. In evaluations of the Lafourche Parish leadership program, 65% of participating 4-H'ers learned how important leading and making decisions were.

More than 7,425 Louisiana 4-H youth served in club officer or parish leadership roles while 6,443 4-H youth served as a committee chair and/or coordinated an activity. Over 8,200 4-H youth planned a 4-H club program. In Plaquemines Parish, 98% of youth participating in Officer/Leadership Training reported that they would use what they learned to conduct more efficient and informative 4-H club meetings.

In FY 2003, 9,129 adult volunteers and 5,024 youth volunteers served the 4-H program. Direct volunteers or volunteers who work directly with youth were made up of 5,636 adults and 4,082 youth. Indirect volunteers were comprised of 4,694 adult volunteers and 2,590 youth. Middle management volunteers, i.e., volunteers who direct other volunteers, were comprised of 603 youth and 535 adults. In Iberia Parish, volunteer leaders served 324 hours worth \$5216.40.

Of volunteers who served the program, 4,674 adults and 6,362 youth received training. In Plaquemines Parish, 95% of the leaders receiving training reported that they would use what they learned to improve their leadership role and involvement in 4-H.

“Great new ideas to expand myself and my club to bigger and better opportunities.” This was just one of the positive comments regarding the State 4-H Leader Forum. As a result of the State 4-H Leader Forum, 100% of the participants were re-energized about 4-H and feel their 4-H program will be enhanced. Ninety-four percent of the participants indicated that they broadened their knowledge, developed their skills as leaders and were motivated to expand their role in 4-H. Fifty-three percent of the volunteers plan to utilize what they learned during 4-H Leader Forum with all planning to use the information to enhance the management of a local 4-H club, parish, area, or state 4-H project. The volunteers responding to the survey reached an average of 133 youth and 72 adults.

“Learned a lot” “It was .... informative.” These comments describe the experience volunteers had during the Southern Regional 4-H Leader Forum in Eatonton, Georgia. According to a follow-up survey, 100% of the leaders indicated they were re-energized about 4-H, increased their knowledge of youth development, and were motivated to expand their role in 4-H. Ninety-three percent broadened their knowledge of new projects and areas, developed their skills as a volunteer, and felt their 4-H program was enhanced. One hundred percent indicated that they have utilized and shared what they learned during the Southern Regional 4-H Leader Forum in a variety of settings. The volunteers in attendance reached an average of 110 youth and 53 adults in their 4-H programs.

A total of 2,583 Louisiana youth are enrolled in 4-H citizenship and civic education projects. More than 31,250 4-H youth were involved in at least one community service project, while 12,328 participated in service learning projects. These youth have served their community in a variety of ways including visiting nursing homes, mentoring youth, conducting bicycle and safety events, maintaining building and landscaping areas, designing greeting cards, sewing cancer caps, composing letters, supporting community festivals, conducting beautification projects, weathering homes, collecting and donating money and goods, tutoring students, developing web pages, cleaning up the environment, conducting holiday events, and presenting

lessons and puppet shows. These citizenship and service learning programs benefited over 49,501 youth and adults throughout Louisiana and beyond. The following organizations or causes received benefit from 4-H service projects: Boys and Girls Club, local food banks, Ronald McDonald House, American Heart Association, Cancer Society, Red Cross, Hilman House, local libraries, local women and children shelters, medical organizations, Afghanistan children, military, Council on Aging, St. Jude, local United Ways, local humane societies, Public Safe and Drug Free School programs, and local museums.

Community service projects included various collections of books, food, grooming supplies, toys, medical supplies, pet food, goods for troops overseas, disaster relief kits, and coats. Avoyelles, Bienville, Caddo, East Carroll, Lincoln, Quachita, and St. Martin parishes reported collecting 41,500 pounds of food, 2,009 canned items, and 83 bags of groceries. Using a USDA serving formula of .663 cents per ounce, a conservative estimate of just the pounds of food donated was worth \$440,232. Eighty percent of the Caddo 4-H Junior Leaders gained greater understanding of community needs through ongoing work with the Northwest Food Bank by making donations and packing and loading food items. Seventy percent of St. Martin 4-H Junior Leaders indicated that they were willing to continue volunteering for the good of their community.

According to the Extension Planning and Reporting System (PARS) and Impact Report databases, over 500 youth and adults involved in Extension programs raised over \$63,500 to benefit local causes and economic development. In Washington Parish, \$2,400 was raised for Relay for Life. Jackson Parish volunteers raised \$2,700 for Relay for Life reaching 7,000 persons, and \$10,000 was raised for the American Heart Association. Grant Walker 4-H Educational Center received \$6,000 donated by Louisiana Wild Turkey Federation to rebuild their archery range. In St. James Parish, \$10,000 was raised for Fast Food Farm. Some 300 St. Bernard Parish volunteers have agreed to help with raising over \$30,000 for a St. Bernard Community Playground. Twenty-five Pointe Coupee 4-H Junior Leaders made business contacts to introduce the Team City Cash Certification Program resulting in \$2,400 raised and helping accomplish Team City's economic development goal.

Literacy is a major Extension effort. The efforts documented in PARS and the Impact Reports database indicate that over 4,179 children have benefited from Extension's literacy efforts. A sample of the efforts includes the following parish accomplishments. A total of 250 Jefferson Parish 4-H'ers, local FCE, Public Library and friends of the library distributed approximately 2,000 Character Critter books in Raise-a-reader packets to families with young children and worked with 3,652 children on reading. LaSalle Parish reached 340 kindergarten and four year olds through Character Critter books. In Union Parish, 500 character books were distributed at Ag Expo and Chamber of Commerce Fun Day in the Park. In Concordia Parish, 44 leaders taught Character Critters through literacy efforts.

Over 2,550 youth from Allen, Avoyelles, Beauregard, Catahoula, Claiborne, Jackson, Orleans, LaSalle, Plaquemines, St. Charles, and Tangipahoa parishes and 475 adults from 3 parishes have



reached 18,920 youth through teaching them a variety of topics including arson prevention, environmental issues, 4-H projects, character education, safety, job readiness, and nutrition.

Louisiana had two statewide community service learning programs in 2003. In summer 2003, LSU AgCenter's Grant Walker 4-H Educational Center campers from 63 parishes conducted a Hunger Project. The garden and food collection was used as a tool to teach the 4-H'ers about good character and doing good for others. The vegetables and 3,593 pounds of canned food collected were given to the Food Bank of Central Louisiana. Jayne Wright from the Central Louisiana Food Bank praised the efforts and thoughtfulness of the 4-H'ers. "The whole idea behind this project is to teach young people about hunger and what they can do to help others," Wright said. "We want to create an awareness so that these youth will get involved with similar projects when they go back home. The 4-H'ers have been wonderful in giving of their time to help us."

Louisiana 4-H'ers helped "Mend a Heart With 4-H!," a project that had Louisiana 4-H'ers collecting teddy bears to give to children who are victims of tragedies such as a car accident or a house fire. More than 1,500 teddy bears and other toys were collected and delivered to the children's center at Our Lady of the Lake Hospital and the Baton Rouge Fire Department. Sharon Doescher of Our Lady of the Lake Hospital said, "These bears will bring smiles to many children who are in the hospital. The children can hold onto these teddy bears and have a friend with them while they are in the hospital."

#### **Source of Funds**

State, Federal (Smith-Lever 3 b, c)

#### **Scope of Impact**

Multi-state: Educational program and service efforts sponsored and led by Cooperative Extension 4-H staff, leaders, and volunteers reached all parishes in Louisiana and beyond our state's borders. A total of 28.9 FTEs was expended in the leadership and volunteer development program. It is estimated that 20% of these resources were allocated to multi-state activities, including training, curriculum sharing, publications, etc. The dollar equivalent of multi-state work is \$436,186 (28.9 FTEs x \$80,136 FTE x .20).

#### **Federal Goal 5**

#### **WORKFORCE PREPAREDNESS**

**Key Theme: Workforce Preparedness**

**Juanita Johnson, Professor, 4-H Youth Development Department, LSU AgCenter**

#### **Program Description**

The LSU AgCenter's Department of 4-H Youth Development, Workforce Preparation Initiative Implementation Team, a professional development and program coordination body for all issues related to workforce education and training serves as convener and connector of state-level youth-serving agencies, along with employer representatives, youth, parents, and community leaders in implementing workshops, projects, and programs to prepare youth to be able to determine the kinds of jobs available in today's job market and the kinds of education required to secure those jobs.

Ensuring that youth have the full range of skills needed to move successfully into adulthood and become productive members of society is a critical issue in Louisiana. For youth to successfully prepare for, find, and retain employment, they must be able to demonstrate their abilities to use a variety of work readiness skills. The Workforce Preparation Initiative introduced significant changes in the 4-H Youth Development Program to address these needs by extending to 4-H and other youth-serving agencies curricula on youth career decision-making, workforce readiness, and entrepreneurship. The Initiative which targets all youth from fourth grade through high school, creates curriculum and teaching resources, and identifies and evaluates career-focused resources for sharing and replication through a Sharing Success project.

In addition to curriculum development, the Initiative also provides professional development opportunities for career counselors, Extension faculty, adult volunteer leaders, parents, and teen leaders. Through a tri-state initiative, involving Mississippi and Arkansas, Louisiana formed a state-level team of youth and adults to help plan a youth workforce preparation conference. Technical assistance was also provided to guide local communities in developing workforce preparation programs. Programs such as Career Connections, Welcome to the Real World, and the Reality Store bring adult mentors from all parts of a community together to help youth develop necessary skills for employment.

The Workforce Preparation Initiative participants also benefit from connections to learning supports such as career assessments, career planning, and opportunities for civic engagement, such as community service and visits with legislators and other governmental officials. An increase in innovative approaches to workforce education such as the Youth Cooperative Leadership Conference convened stakeholders, the Louisiana Council of Farmer Cooperatives and Cooperative members to provide hands-on entrepreneurial training for 100 youth. Participants formed a cooperative and gained skills and knowledge in business and community education.

### **Program Impact**

Specific activities in the workforce preparedness program and examples of outcomes of those activities are described.

Activities:

- Established a resource library of workforce preparation educational resources at local and state Extension Service offices for use in conducting educational programs and workshops.
- Organized a Workforce Preparation Implementation Initiative Team of youth and adult representatives to collaborate with Louisiana's Department of Education, local School-to-Work groups and the Department of Labor to enhance the preparation of youth and adults for careers and their role as responsible citizens.

Outcomes:

- Forty-three parish Extension offices submitted reports on the development of workforce competence among youth through workforce preparation activities such as Career Days, Workplace study and tours, career-focused lessons taught at 4-H Club meetings, and career development, parent education programs.
- A total of 17,192 youth and parents/guardians increased their knowledge about career planning.

Activities:

- Posted workforce preparation educational resources on the 4-H Web site.
- Provided training through Distance Education on Louisiana Career Options Law, the Skills Gap Report, Internet-based workforce preparation resources and resources, available through Louisiana's Department of Labor.

Outcomes:

- Six hundred seventy-two youth improved their job-seeking skills through adoption of recommended job interviewing, resume writing, and job application practices.
- A total of 3,510 youth completed career tests and inventories and demonstrated how to use the information in deciding career opportunities.
- More than 8,890 youth explored career options and identified career clusters to use in developing career plans.
- Thirty-two parishes submitted reports on conducting workforce preparation activities at Junior Leader Club meetings, 4-H Short Course, regional 4-H project training programs and 4-H Challenge Camps.

Activities:

- Developed and distributed three workforce preparation tool kits of educational guides and lesson plans for use in developing and conducting educational programs.
- Developed and disseminated workforce preparation powerpoint presentations and lesson plans aligned with Louisiana's Content Standards and current workplace needs.

Outcomes:

- A total of 192 youth developed social and etiquette skills and demonstrated knowledge of selecting appropriate dress for work environments.
- A total of 179 youth demonstrated an understanding of the importance of attendance, punctuality and taking responsibility for job success as high expectations by employers.
- A total of 672 youth developed their first resumes.
- A total of 2,959 participants in career planning activities indicated that they plan to use information on career cluster and options to determine career plans.
- A total of 210 youth indicated that they realize the value of an education and career choice by participating in the Reality Store and Welcome to the Real World Programs.
- A total of 360 youth demonstrated ways to interact positively in work environments.
- A total of 42 parents/guardians and 20 teen leaders indicated that they increased their knowledge about ways to help youth develop career plans.

**Source of Funds**

State and Federal (Smith-Lever 3 b, c)

**Scope of Impact**

Multi-state: The total FTEs expended on the Workforce Preparedness program was 7.26. It is estimated that 50% of the staff resources allocated to this program was multi-state work between Louisiana 4-H, national, and state extension services. The dollar equivalent of multi-state work is \$290,894 (7.26 FTEs x \$80,136 FTE x .5).

**GOAL 5**  
**RESEARCH SUMMARIES**

## Federal Goal 5

**Title: Value Addition to Wastes from Louisiana Crawfish and Catfish Processing Plants**

**Key Theme: Adding Value to Agricultural Products**

**Witoon Prinyawiwatkul, Associate Professor, Department of Food Science, LAES, LSU AgCenter**

**Issue:** Large quantities of solid wastes are generated from crawfish and catfish processing plants. With increasingly more stringent environmental regulations, processors have been searching for alternative income-generating ways of handling crawfish and catfish processing wastes. It is no longer practical to discard processing wastes especially when a significant amount of valuable raw materials can be recovered and used to produce value-added new products and functional ingredient. The magnitude of this resource as value-added products suggests a strong economic potential with major impact on the entire catfish and crawfish industries.

**What was done:** Chitosan is a biopolymer that can be produced from crawfish shell waste. Chitosan's antimicrobial and gel forming properties make it ideal for use as coating material that can improve weight retention, lower vapor transmission, and prolong shelf life of foods. We studied efficacy of chitosan coatings on improving shelf life of eggs during a 5-week storage at 25C. The R-index approach was used to determine the consumers could discriminate chitosan-coated eggs from non-coated eggs. Fresh grade-AA eggs coated with 0 percent chitosan (NC) and 1 percent acetic acid (A) served as the controls. Chitosans used were: low-Mw, 470 KDa; medium-Mw, 760 KDa; high-Mw, 1,100 KDa. Six chitosan-coating solutions (in acetic acid) were prepared: L (1 percent low-Mw), l (2 percent low-Mw), M (1 percent medium-Mw), m (2 percent medium-Mw), H (1 percent high-Mw), h (2 percent high-Mw). The lowest weight loss (5.9 percent) was observed in the h-coated eggs compared to 6.6 percent of NC eggs. Among chitosan-coated eggs, the m eggs had the highest yolk-index value throughout a 5-week storage. The Haugh units indicated that the NC and A eggs vs. the coated (l, m, h) eggs changed from grade-AA to grade-B, respectively, after 1-week vs. 3-week storage. The m-coated eggs had the highest Haugh unit ever after 4 weeks. Yolk color lightness slightly decreased from 60.6-67.0 at week 1 to 56.8-66.0 after 5 weeks. The M, m, L, l coated eggs maintained yolk redness but showed increased yellowness over time. The pH of NC and A eggs increased from 7.3 to 7.6 after 5-week storage while minimal changes was observed in all coated eggs. Consumers could not detect differences in smoothness of chitosan-coated eggs from the NC eggs. They indicated that the l (2 percent low-Mw) chitosan-coated eggs were glossier than the NC eggs. The CO eggs had the lowest R-index values for smoothness and glossiness, indicating that they were least different (though not significant) from the NC eggs. Consumers detected odor differences in the M and m coated eggs from the NC eggs; many consumers indicated the pungent odor of acid in the M and m coated eggs. For overall difference, the R-indices for M, m, L, and l coated eggs were, respectively, 53.27, 51.24, 52.82, and 55.23 percent, indicating that consumers could not

discriminate between coated and non-coated eggs. The study demonstrated potential use of chitosan for enhancing shelf life of eggs.

Catfish viscera, a processing waste, contains about 30-35% fat and may contain health promoting fatty acids. Fatty acid profile of catfish visceral oil was characterized by the microwave-assisted fatty acid analysis developed in our laboratory. Predominant fatty acids in visceral oil were C18:1, C16:0, C18:2, and C18:0. Visceral oil contained 4.3 mg/g of decosahexaenoic (DHA) and 4.6 mg/g of arachidonic acids. The whole viscera and liver portion may serve as a good source of health-promoting fatty acids. Quality of purified catfish oil was thoroughly characterized. Thermal degradation of fatty acids of catfish visceral oils was monitored. Rheological properties of catfish oils during purification process were characterized. A design for a fixed-bed or continuous adsorption column for removal of free fatty acids and oxidized compounds from crude catfish oil was successfully developed. The information obtained is useful for developing unit operations for commercialization of catfish oil.

**Impact:** Processors have shown an increasing interest in using solid processing waste as potential useful raw materials for development of value-added functional food ingredients. Adding value to crawfish shell waste and catfish viscera would minimize pollution problems and offset costs involved in disposal of processing byproducts or waste, and, at the same time, maximize the processors' profits. Development of new value-added products and functional ingredients from byproducts and processing wastes will not only enhance the competitiveness of the Louisiana crawfish and catfish industries, but also enhance the state's economic development. The information obtained from this research will be useful for crawfish and catfish processors who wish to adopt the technology for developing value-added new food products and functional ingredients.

**Sources of funding:** State, Hatch, USDA Aquaculture Special Grants

#### **Federal Goal 5**

**Title: Exploration of Market Potential of American Alligator and Ratite Leather Products and Promotional Strategy Development**

**Key Theme: Adding Value to New and Old Agricultural Products**

**Teresa Summer, Professor, School of Human Ecology, LAES, LSU AgCenter**

**Issue:** With the economic base of rural regions shifting, the focus of rural development strategies too must shift from traditional farming and manufacturing activities. Rural economies could be boosted by promoting the utilization of unique, renewable resources -- alligator and ratite -- in the production of apparel, accessories, and interiors products. Alligator and ratite (ostrich and emu) production have become important industries in rural America. Alligator production has changed from inconsistent trapping in the wild to a well-managed format based on farming and trapping across the entire southern United States. Louisiana is the leading

provider of slaughtered alligators to markets. Ratite production, begun as a breeder market, now occurs in every state in the Union. Leather from these animals, known as "exotic" leathers in the trade, offers tremendous potential for use in apparel and accessories as well as in interiors (residential/nonresidential) products. A limited number of U.S. tanneries are now processing alligator and ratite skins. Most tanneries, like producers, are located in rural areas.

The U.S. market for alligator and ratite leathers has historically been limited to a fairly narrow range of products such as boots, belts, and wallets targeted, primarily, to the masculine consumer. In contrast, these leathers have been used in the European market primarily for feminine apparel products and accessories, such as handbags and shoes. As a result of differences in end-use of the raw materials, the European market for alligator and ostrich leathers is stronger and more fully developed than the U.S. market. Most American skins, raw or tanned, are sold to manufacturers in Europe or Asia to be made into consumer products. Rural America is providing raw materials, but failing to reap the benefits of value-added processing, which could significantly enhance local economies.

This project is designed to stimulate the demand for apparel and interior products made with American alligator and ratite leather. Expansion of existing U.S. markets and development of new markets can result in an increase in overall demand for raw materials and finished products thus stimulating the American alligator and ratite industries as well as related industries.

**What was done:** An ongoing research initiative to explore opportunities to expand domestic demand for American alligator leather produced in Louisiana began in 1997 through the LAES in conjunction with a grant from the Louisiana Board of Regents Support Fund, funds from the Louisiana Fur and Alligator Advisory Council, the LA Emu Association, and support from additional industry groups. The overall goal of the project is to expand market opportunities for American alligator and ratite leather products.

In 2003, collaboration with industry partners continued. The survey of consumer preferences for emu leather apparel products, including attitudes, perceptions, product attributes, and fashion involvement begun in 2002 was completed. Consumers representing the young adult market, who often set trends in the fashion world, were surveyed. Their views frequently have an impact on other market segments as well. Fashion involvement theory served as the theoretical framework. A survey instrument was administered to a convenience sample of 229 college students at a major university in a southern state. The instrument consisted of the following validated scales: attitudes toward and knowledge of emu leather products, purchase intention, fashion involvement, and demographics. The sample consisted of college students (75% female and 25% male), ages 17 to 21. The mean attitude score for product attributes indicated that most of the respondents were not knowledgeable or familiar with this product. As a result, attitudes toward the product were slightly negative. Almost half of the sample indicated that they were not interested in purchasing an emu leather product because it would not be a wise investment or personally rewarding for them. These results may have been influenced by the low fashion involvement of most of the respondents.



**Impact:** It is recommended that the emu leather industry develop promotional strategies to educate young consumers about the unique possibilities of emu leather products. Targeted promotion would make young consumers more aware of the personal rewards of owning an emu leather product. Although emu leather products are relatively new to the market, they could serve to attract the young trendsetter if promotion focused on the novel and unique material. Capturing the interest of the trendsetter with new products might provide enough personal reward for purchase. If young consumers view emu leather products as unique and novel, they may be more inclined to make a purchase. In addition, if young consumers purchase trendy products made from emu leather, then older consumers in other market segments might find this product appealing as well. Results continue to be analyzed and manuscripts prepared from previously reported national surveys of affluent female consumers, retailers, and manufacturers measuring their awareness of exotic leather products, purchase intentions, and advertising involvement.

**Sources of Funding:** Hatch and industry donations.

## **Federal Goal 5**

**Title: Biobased Nonwoven Composites**

**Key Theme: Biobased products**

**Y. Chen, Associate Professor, School of Human Ecology, LAES, LSU AgCenter**

**Issue:** According to the National Energy Policy of the 2002 Farm Bill (Title IX Energy), biomass research and development is a national priority. The development of biomass technologies for producing bioenergy and biobased products allows domestic natural resources, such as crops, trees, and agricultural residues to be utilized more wisely and economically. Implementation of this R&D priority will benefit the nation's energy security, environmental protection, and rural economic growth. With a greater concern for environmental protection, it is more and more important for automakers to improve vehicle recyclability. The European Commission recently proposed a European Guideline 2000/53/EG that sets a goal of improving automotive recyclability, 85% of a vehicle by weight being recyclable by 2005. This recyclable percentage will be increased to 95% by 2015. In the U.S., such requirements have not been regulated. However, any automaker that exports cars to the EU countries must comply with these requirements. This industrial need provides a new opportunity for U.S. agriculture to support the industrial base by developing biomass technologies for producing bioenergy and biobased products to replace petrobased products.

**What was done:** This research is focused on the development of biobased nonwoven composites to target a thrust application area in automotive interior manufacturing. Research accomplishments include production of automotive nonwoven composites from bagasse, kenaf, and ramie and evaluation of these biobased nonwoven composites in terms of mechanical properties, wet properties, thermal properties, and acoustical properties. Carded and airlaid nonwoven techniques for web formation were investigated. Thermal bonding and liquid bonding

methods were also applied in the fabrication of the biobased composites. The produced composite products had different natural fiber contents (50-70%) and different composite structures (uniform and sandwich structures). Weight for these products ranged from 983 to 1370 g/m<sup>2</sup>. Composite thickness was controlled between 2.22 and 3.73 mm. Comparative study indicated that the uniform structures have higher tensile strength and modulus and higher flexural yielding stress and modulus than the sandwich structures. For the wet properties, the uniform composites had less water absorption but higher swelling rate than the sandwich composites. This revealed that the sandwich structures would possess dimensional stability as they were used for the automotive application. Thermal analysis showed that the uniform composites featured a higher softening temperature (140°C) and melting temperature (160°C). For the sandwich composites, the softening point was 120°C and melting point was around 140°C. Within the uniform structure group or sandwich structure group, the thermal mechanical properties did not differentiate very much because of the different natural fibers used.

**Impact:** This research is targeting the national research priority for developing biobased products from agricultural renewable resources. Implementation of this research helps develop a nationwide inter-institutional research cooperation. The achieved research progress also has an impact on the sugarcane industry and on one of the state strategies for economic development, advanced materials cluster.

**Sources of Funding:** Hatch, multi-state, and Governor's Biotechnology Initiative

#### **Federal Goal 5**

**Title: Characterization Of The Compositional And Functional Properties Of Rice Starch As A Potential Value-Added Food Ingredient**

**Key Theme: Adding Value to New and Old Agricultural Products**

**Joan M. King, Associate Professor, Department of Food Science, LAES, LSU AgCenter**

**Issue:** The rice industry suffers from a glut in the market, which has driven the price for rice a whole kernel down. The economic return for rice has dropped from \$4 / bushel to less than \$2/bushel, while those of the soybean and corn industries have remained steady from 1998 to 2002. The total 2001 U.S. production values for corn and soybeans were \$19 billion and \$12 billion, while rice was only \$0.9 billion. The main difference between these industries is that corn and soybean are not only sold whole but are made into value-added ingredients. The modification of corn starch to produce value-added food ingredients has driven the selling price of native corn starch from \$0.20/pound to \$2.50/pound for modified corn starch-based fat replacers. There is a potential of a 10-fold increase in the value of rice starch, from the development of rice starch-based fat replacers and resistant starch, through utilization of the same technology.

**What was done:** The overall goal of this research is to develop value-added rice starch based ingredients. The specific goal of this research is to enhance the resistant starch properties of rice flours and starches. Our main objectives are 1) to determine the effects of lipid and amino acid additives on the crystallinity of commercial and isolated rice starches. Enhanced crystallinity may indicate that the starch is more resistant to enzymatic digestion and so may have fiber-like properties in the body; 2) to determine the effects of enzymatic treatments on the resistant starch properties of rice starch and flours; 3) to determine if oxidized starches with resistant starch properties can be formed using ozonation. Objective 1) Residual proteins in brown flour starch isolate had a major influence on the crystalline properties of the starch. Monoglyceride and phospholipids enhanced crystallinity of commercial rice starch by 85 to 106 percent. All charged amino acids tested caused increased relative crystallinity for both commercial rice starch and white rice flour starch isolate. The next steps are to determine the resistant starch properties of these samples, to test larger concentrations of additives, and to combine the additive study with that of the ozonation study. Objective 2) Studies on enzymatic treatments of rice flour and starch to enhance resistant starch properties were successful. Ingredients with a range of resistant rice starch levels could be produced on a lab scale. Several of these resistant starches showed stability to heating and had viscosity properties similar to the starting material. A patent application has been submitted. The next steps are to determine scalability of the results. Objective 3) This research area is currently underway and preliminary results indicate that ozone can decrease gelatinization temperatures and the enthalpy of gelatinization for lipid-starch complex. Further study is necessary to determine the effects of ozonation on starch viscosity properties and resistant starch levels. The information in these studies can be useful for modified rice starch and flour ingredient development.

**Impact:** The information from this research could be utilized to produce value-added food ingredients from rice starch and flour. There could also be an increase in the value and use of broken rice kernels, which make up 15% of milled rice in the U.S., through their use in the production of starch-based food ingredients. This research will benefit the Louisiana rice farming and processing industries by providing a new utilization for rice that will result in an increase in its national competitiveness and demand in the food ingredient and product market. This will in turn increase the economic value of rice and increase the amount of production and processing done by the existing industry and result in new facilities being opened. This research will also provide an easily incorporated source of food fiber that can be beneficial in helping to control or prevent diseases such as diabetes and cancer.

**Sources of funding:** State, Hatch, Louisiana Rice Research Board

## **Federal Goal 5**

**Title: Polymers and Polysaccharides from Sugarcane**

**Key Themes: Efficiency; Biobased Products; New Uses for Agricultural Products; Food Quality**

**Donal Day, Professor, Audubon Sugar Institute, LAES, LSU AgCenter**

**Issue:** The development of new technology for the production of the biopolymers (glucoooligosaccharides) from sucrose.

Use of a chain shortening acceptor and a specific microbial strain allowed the production of highly branched polymers in a dextran fermentation, resulting in production of selected \*-glucoooligosaccharides. It appears that these oligosaccharides are utilized preferentially by probiotic strains. There is also an added effect in that these compounds act as an inhibitor of  $\alpha$ -glucosidase in microorganism, blocking the last stage in the metabolism of starch in the intestines. These studies do not allow direct prediction of “in vivo” effects but indicates that this type of oligomer can be a prebiotic for intestinal microflora.

**What was done:** The details of scale-up production of the oligosaccharide were completed and sufficient oligosaccharide produced for poultry feed trials (to be conducted by the USDA) and rat toxicity testing (to be conducted at LSU). Sufficient commercial interest was generated in the local sugar industry to fund the animal testing.

**Impact:** The manufacture of glucoooligosaccharides from sucrose offers direct and obvious benefits to the sugar industry. These polysugars have a significant market potential as functional foods, estimated as high as \$250 billion. It appears there could be a specific use as a health food. It is possible also that it can be used as a poultry feed additive to help replace antibiotics in raising “safe” poultry. This is of extreme interest with the reported rise in antibiotic resistant microbial infections. The effect of variation in oligomer structure on functionality is still to be investigated, as well as animal safety and functionality studies.

**Sources of funding:** State

## **STAKEHOLDER INPUT**

The LSU AgCenter consistently seeks stakeholder input on all research and education programs in order to maintain a focus on clientele needs and ensure that its research and extension programs have value and impact. During the programming year the LSU AgCenter continued to place emphasis on its Advisory Leadership System which has as its primary goal to ensure that all research and educational programs of the LSU AgCenter are: (1) effective in meeting the needs of clientele, (2) being delivered in a manner that makes them accessible to all people, and (3) constantly assessed for relevance to insure that they remain current. Regional Advisory Leadership Councils were added to the system in 2002 year with structural changes that were made in the AgCenter. These regional councils, comprised entirely of stakeholders, provide valuable advice to the Regional Directors regarding how the LSU AgCenter can improve service to stakeholders in the region by marketing the LSU AgCenter and its programs and identifying issues within the region. In the 2002-2003 program year, all eight AgCenter regions conducted Advisory Council meetings with a total of over 200 stakeholders participating. Issues that the AgCenter will continue to address during the coming year which emerged from the stakeholder meetings are better marketing of AgCenter programs; the need for public education regarding agricultural production; increased partnerships and collaborations between AgCenter and businesses, agencies and organizations; the future of Extension in regard to staffing and maintaining a local presence in the community; the future of Louisiana agriculture and issues regarding rural/urban interface.

The AgCenter works closely with all the major commodity associations, i.e., cattlemen, rice producers, grain producers, sugarcane producers, the Louisiana Farm Bureau, family and community development associations, 4-H youth associations and groups to get input and guidance on programs. These organizations not only give guidance but also support many of the programs with monetary and physical assistance.

Another dimension of obtaining stakeholder input for research programs are the “Agricultural Center Exchange” groups which meet in conjunction with the LSU Agricultural Center’s Annual Conference each year. These groups cover all of the economically important commodities produced in Louisiana as well as environmental, value-added, family, economic, and nutrition issues. Each session is attended by all Ag Center research scientists and extension specialists and agents with programs in the respective areas. Stakeholder input into research programs is provided by the cooperative extension personnel who bring a statewide perspective of the highest priority needs and researchable problems.

### **Extension Section**

The Cooperative Extension Service had conducted a series of community focus forums in every parish during the 1999-2000 program year involving a wide base of the citizenry and leadership of the state, including public officials, and representatives of business, industry, youth, and minority groups. The diversity of the state was captured by ensuring that gender, age, and ethnic groups were represented in the forums. Parish forums identified key concerns and issues needed

to be addressed for a better future for parish residents. Major concerns identified in the forums were economic development, protection and conservation of the environment, quality education, youth development, family support and structures, crime and other social issues. Based on this input from stakeholders, the LCES developed a statewide strategic plan for the five-year period, 2000-2004, focused on 12 initiatives – After-school Education and 4-H Adventure Clubs; Economic Development; Master Farmer; Water Resources Management; Waste Management; Coastal Restoration, Environmental Horticulture; Family Financial Management; Farm Financial Management; Leadership and Volunteer Development; Nutrition, Diet, and Health: Parenting and Child Care. Parishes reported to their citizen groups the outcome of the forums, including strategic plans at the local and state level to address the initiatives that would be addressed. Initiative teams consisting of extension agents and specialists, and researchers have since developed action plans and educational resources and curricula to enable agents to conduct education programs in need areas.

In addition to the above strategic planning process, parishes continued to involve leaders and influentials in agriculture, home economics, youth, and community and economic development in various commodity and subject-matter advisory committees to provide input on needs and problems which could be addressed in local programs. For a state perspective, extension specialists engaged representatives of their commodity or subject-matter area to give input on clientele needs and problems.

### **Research Section**

Louisiana Agricultural Experiment Station scientists and administrators continued to meet regularly with a number of stakeholder groups as indicated in the Plan of Work. A representative but not a comprehensive list of some of these meetings is attached. The generalized forum for these stakeholder sessions is a series of presentations of research findings and proposed research activities by scientists directly to the stakeholder panels. This is followed by questions and discussions led by the stakeholders which provide focus, direction, and specific suggestions that are incorporated into the respective research programs.

On a broader dimension, LAES scientists and administrators participate each year in the Louisiana Farm Bureau Federation Annual Convention. As reflected in the Plan of Work, this is the predominant agricultural organization in Louisiana representing the total spectrum of agriculture, natural resources, youth, and policy issues of concern in Louisiana. Beyond the general sessions, scientists and administrators participate and interact directly in “commodity advisory committees” which are constituted by stakeholders and provide another important feedback opportunity relative to research needs and recommended directions.

**MERIT REVIEW**

**Meetings with Stakeholders - (1998 - 2003)**

|   |   |
|---|---|
| Cotton Support Committee:                     | March 18, 1998<br>March 17, 1999<br>March 14, 2000<br>March 13, 2001<br>September 10, 2002<br>September 10, 2003                                |
| Rice Research Board:                          | October 28, 1998<br>December 16, 1999<br>December 14-15, 2000<br>November 12-13, 2001<br>November 21, 2002<br>November 18, 2003                 |
| Soybean and Grain Research & Promotion Board: | December 1-2, 1998<br>December 8-9, 1999<br>November 30 – December 1, 2000<br>November 28-29, 2001<br>November 19-20, 2002<br>November 20, 2003 |
| American Sugarcane League:                    | February 3, 1998<br>February 4, 1999<br>February 23, 2000<br>January 28-29, 2001<br>February 19, 2001<br>January 28, 2002<br>February 19, 2003  |
| Louisiana Beef Industry Council:              | May 5, 1998<br>October 14, 1999<br>October 10, 2000<br>October 11, 2001<br>January 11-12, 2002<br>December 13, 2003                             |

### Meetings with Stakeholders – (1998 – 2003) - Continued

Louisiana Catfish Promotion and Research: September 2, 1998  
June 23, 1999  
September 29, 1999  
December 5, 2000  
August 29, 2001  
October 29, 2001  
May 9, 2002  
August 21, 2002  
May 14, 2003

Louisiana Crawfish Promotion and Research Board: May 19, 1998  
August 10, 1999  
July 17, 2001  
February 12, 2002  
May 9, 2002  
May 28, 2003

Louisiana Sweet Potato Commission: June 11, 1998  
June 17, 1999  
June 14, 2000  
June 13, 2001  
May 22, 2002  
June 19, 2003

Louisiana Farm Bureau Federation: July 3, 1999  
July 15, 2000  
July 12-15, 2001  
July 10-12, 2002  
July 12, 2003



## **PROGRAM AND PROJECT REVIEWS**

Two comprehensive CSREES program reviews were held during the reporting period. A review of the statewide research and extension programs in Food Science was held on March 25-28, 2003. Statewide research and extension programs in Human Ecology were reviewed on April 28 – May 1, 2003. Both reviews were conducted by panels consisting of CSREES leaders and research/extension peers from other universities. The focus of the reviews was directed toward the future roles of research and extension professionals working in an integrated manner to address Louisiana's needs in these two important areas.

Project peer reviews of the proposed research activities of individual scientists continued according to CSREES guidelines as reflected in the Plan of Work. Approximately 47 project reviews were conducted which led to the establishment of approved projects with initiation dates during the reporting period, 10/01/02 to 9/30/03. Following the established policy, review comments are solicited from peer scientists and extension specialists and the comments and a synthesis of recommendations are provided to the originating scientist by a member of the LAES administrative team. The changes made in the proposed project by the originating scientist are then reviewed at the LAES administrative level prior to final project approval.

## **EVALUATION OF MULTI-STATE ACTIVITIES**

### **Extension Section**

The evaluation of multi-state activities has been beneficial in identifying ongoing activities and opening up new opportunities for collaboration between states and extension/research personnel thus strengthening the overall cooperative effort. In most cases, programs were identified and developed that had been identified by stakeholders. Under-served and under-represented populations were identified especially in youth and family and consumer sciences programs. Preliminary assessments indicate that these programs are having the desired impact. Effectiveness and efficiency in utilizing materials from other states, collaborating on research projects, and communication among professional faculty and staff in different states have improved. Multi-state efforts initiated last year among Arkansas, Mississippi, and Louisiana on pesticide applicator training, digital diagnostic centers, and limited resource management program for young families were successfully continued through new materials, publications, and joint training programs. In addition, extension specialists participated in the Southern Extension Research Association (SARE) exchange groups, the Southern Agriculture and Natural Resources committees, and numerous national and regional meetings. These exchanges provide extension professionals with new ideas and materials, and enable collaborations that result in new and more effective programs for Louisiana. Furthermore, the economic development initiative of the LCES has been greatly enhanced by collaborative work with the Southern Rural Development Center, Mississippi. Similarly, the fiscal year marked an initiative for collaborative programming with the Mississippi based Foundation for the Mid-South.

### **Research Section**

The Louisiana Agricultural Experiment Station has traditionally encouraged and supported multi-state (formerly regional) research activities. LAES scientists have played significant leadership roles in many multi-state activities and they continue to do so today. In fiscal year 2003-2004 LAES scientists were active participants in 41 approved multi-state projects. Of these 41 projects, 16 (39%) were North Central, North East, Western, or NRSP-based activities which reflects the truly national scope of what we refer to as multi-state research. The 41 projects address each of the five national goals. To further reflect the LAES support and involvement scientists' travel expenses to annual technical committee meetings is currently being supported from administrative funds. Finally, to further indicate involvement and support, LAES Directors currently serve as administrative advisors to 11 active multi-state research projects.

## **INTEGRATED RESEARCH-EXTENSION ACTIVITIES**

During 2002, the LSU AgCenter was reorganized to more closely align research and extension functions in addressing problems and issues of various client groups. At the campus level, extension specialists who had been centrally located in the Cooperative Extension Building were moved into respective subject-matter departments and housed with their research counterparts under the administrative supervision of a department head. Several joint research-extension appointments have been made to promote integration. In the field, administrative lines were redrawn to create eight regional research and extension centers, subsuming parish extension agents and experiment station research personnel under their supervision. Regional directors were appointed to provide administrative guidance and better integrate research and extension efforts at the point of local program delivery.

In this way new competencies are brought to both the extension and research clientele. More joint appointments were made as departmentalization continued in FY 2003. This administrative approach includes placement of specialists at experiment stations around the state. Joint appointments are increasing at the stations.

Research and extension personnel continued to work closely to develop joint publications, coordinate research, and conduct educational programs. Concerted efforts have been made to improve communication between research and extension personnel so as to provide improved and rapid service to clients. Special initiatives such as the Formosan subterranean termites, fire ants, water quality, and the Master Farmer Program are being jointly conducted by the Extension Service and experiment station personnel.

Each year, research and extension personnel meet in AgCenter Exchange Groups. Researchers update extension personnel on the latest research projects and results, and extension personnel share their educational programs and the issues and problems their clients are facing for researchers to review and consider in their research agendas. In addition, teams of research and extension personnel meet in discussion groups two to four times a year to update one another on the latest research and education programs.

In the plant science area, researchers and extension specialists meet each year to review research and make recommendations for new varieties, fertilizers, pesticides, and other cultural practices which subsequently form the management practices recommended to clientele.

The LSU AgCenter established a Faculty Council in 2002. It includes 20 elected representatives proportional to faculty rank and divided between “on-campus” and “off-campus”. Off-campus members include extension agents and researchers located throughout the state. The Council provides rapid response and feedback to administration and increased communication and participation in policy to faculty. The administration accepted Council recommendations for increased participation of faculty in vice-chancellor and department head reviews. Council is in the process of reviewing policies on tenure, promotion and dismissal and has been asked to help develop long range plans for the AgCenter.

## **INTEGRATED ACTIVITIES**

### Farm Production Budgets/Market Economics:

Projected costs and returns for numerous Louisiana commodities were developed and/or updated and provided to farm management specialists. These "production budgets" are used cooperatively with extension specialists and presented at grower meetings. Among the crops covered are catfish, crawfish, beef, dairy, broilers, forages, cotton, soybeans, corn, milo, wheat, rice, sugarcane, and vegetables.

### Crop Genetics/Variety Trials/Variety Recommendations:

Variety trials were conducted on corn (hybrid), wheat, soybeans, cotton, warm and cool season forages, sweet potatoes, and sugarcane. Results are published and provided to seed dealers, producers, and extension specialists. Researchers participate directly with extension specialists as the varieties recommended for planting are being selected. Both research and extension personnel became involved in outreach activities in variety recommendations through participation in parish (county) agent training sessions and commodity producers meetings.

### Insecticide Efficacy/Insecticide Recommendations\*:

Insecticide efficacy studies are conducted on all major Louisiana plant and animal pests. The data from the efficacy studies are provided to extension specialists, crop consultants, and producers at seasonal meetings and through direct contact. Research scientists participate directly with extension specialists to prepare insect control recommendation guides which are used throughout the extension system in educational activities.

### Herbicide Efficacy/Herbicide Recommendations\*:

Herbicide efficacy studies are conducted on all major Louisiana crops. The data from these efficacy studies are provided to extension specialists, crop consultants, and producers at seasonal meetings and through direct contact. Research scientists participate directly with extension specialists to prepare weed control recommendations which are used throughout the extension system in educational activities.

### Plant Health/Treatment Recommendations\*:

When cooperative extension specialists encounter plant health diagnosis problems they are assisted by research scientists. The scientists involved carry applied research activities on the efficacy of disease preventive agents and are active in providing assistance in the formulation of disease control recommendations used by extension specialists in educational programs.

#### Food and Agricultural Biosecurity:

In 2001 the state's agricultural community and government officials became concerned about terrorist attacks as well as the ever-present likelihood of the accidental introduction of damaging diseases and/or other pests into Louisiana's food production system.

In response, the LSU AgCenter and several co-sponsors hosted the Louisiana Food and Agricultural Biosecurity; Producer Awareness Conference. The conference helped Louisiana farmers and ranchers become more aware of the problems that could arise from the introduction of plant or animal diseases or pests into their operations.

Speakers prompted attendees to identify the diagnostic capacity needed to protect the food supply and identifying how a food-linked terrorism attack would affect Louisiana's food industry.

The conference was a forum for participants to interact and exchange ideas with leading biosecurity and agrosecurity experts and key policymakers from Louisiana and the nation. Attendees and speakers were able to address actions needed to reduce food contaminations risks.

#### Food Processing/Packaging/Safety:

Research scientists interact with and coordinate programs with extension specialists to develop new food safety procedures and deliver food processing and food safety information. Scientists participate in HACCP training sessions and a "Muscle Foods Laboratory" is jointly used for research studies and extension demonstration.

#### Animal Health/Treatment Recommendations:

Veterinary science researchers conduct programs on aquatic animal health, anthelmintic delivery and efficacy, bovine respiratory disease, and brucellosis. Programs are closely coordinated with the extension veterinary specialist, the School of Veterinary Medicine Diagnostic Lab, and the Louisiana Department of Agriculture and Forestry.

#### Soil Testing/Fertility Recommendations:

The Soil Test Laboratory is operated by the LAES and all results are provided to the LCES soil scientist for fertility recommendations. County agents are involved in the delivery of the fertilizer recommendations.

#### Animal Waste Management:

Major research and extension outreach activities in this area are closely integrated. Land application of poultry litter and runoff from extensive dairy operations are the highest priority

areas. Research scientists teamed with extension specialists to prepare the waste management sections for BMP manuals used in extension outreach programs.

#### Master Farmer Program:

The Louisiana Master Farmer program is an effort to demonstrate that agricultural producers can, and will, voluntarily reduce the impact that agricultural production has on Louisiana's environment while remaining economically viable through the adoption of research-based production practices and following recommended farm and financial management principles, as it relates to environmental stewardship. The Master Farmer Program will be implemented through a multi-agency/organization partnership with the Louisiana Farm Bureau Federation (LFBF), the Natural Resources Conservation Service (NRCS), the Louisiana Department of Environmental Quality (LDEQ), the Louisiana Department of Natural Resources (LDNR), the National Oceanic and Atmospheric Administration (NOAA), the Louisiana Cattlemen's Association (LCA), and the Louisiana Department of Agriculture and Forestry (LDAF). Upon completion of the Master Farmer program, producers will be certified in environmental stewardship.

The Master Farmer Program is divided into three phases, and a participating farmer must complete all three to become a certified master farmer. The program consists of three phases. Phase one consists of environmental and BMP education, including an eight-hour session of classroom lectures and interaction between the Ag Center and farmers. The course is made up of material developed by the NRCS, LDEQ, DNR, LACD and the AgCenter. The second phase consists of "model farm" visits, where enrolled farmers visit sites in their watershed where BMPs have been implemented and the farm managers have completed the training. The third phase is the development and implementation of site-specific conservation plans including the implementation of BMPs at a cost-effective level.

The Master Farmer program is a unique, statewide, and successful comprehensive watershed based approach to reducing agricultural nonpoint source pollution. Currently, the initial "model farms" are in the implementation stage and each year, farms in two or more watersheds throughout the state will be added to the list. There are over 1,300 enrolled farmers representing approximately 600,000 acres. Each of the agencies contributes through either monetary or information means, and are determined to participate even more as the program spreads throughout each of the twelve watersheds. Federal funds are also used to support the implementation, this year 319 money will be used for BMP implementation on the model farms, and the program administers plan for USDA conservation program funds will also be used in the implementation phase as well. Other states, such as Mississippi and Arkansas, have shown interest in starting similar programs due to the success of the initial push in Louisiana. The farmers in Louisiana are excited about the program and the opportunities it creates, and enrollment is increasing. The farmers, agency employees, programming organizers, and the public are energized to take this integrated approach of production, economic, and environmental stewardship to facing the pollution problems of today.

\*Parish (county) agent training meetings, commodity producer meetings, the Louisiana agricultural Consultants Association annual workshop and the annual meeting of the Louisiana Plant Protection Association are characterized by programming that includes the integrated activities engaged in by research and extension professionals in entomology weed science, and plant pathology. These educational venues highlight integrated activities conducted throughout the year and by their nature-are integrated activities.

#### West Nile Virus:

The LSU AgCenter's rapid response to the health threat of mosquito-borne diseases was comprehensive: 1) Awareness: The AgCenter's mosquito website made its debut in May, 2002. It evolved from the initial purpose of being the host site for the mosquito conference held in June, 2002. The mosquito website then was transformed into a popular resource site with extensive information about mosquitoes. 2) The mosquito-borne diseases conference was timely in both raising awareness and providing scientists, educators and the media a means to assure the best available materials were available to the public. 3) An LSU AgCenter and Louisiana Department of Health and Hospitals initiative to conduct mosquito surveillance in the 11 parishes that had confirmed cases of West Nile Virus and did not have a parish mosquito abatement program was conducted. A youth outreach program (**Skeeter Busters**) via 4-H clubs was an element. Family and Consumer Services targeted the elderly population due to their susceptibility to West Nile infection. 4) Posters and publications: a) Questions about Eastern Equine Encephalitis and Horses, b) Insect Repellants, 3) Taking the Bite out of Mosquitoes, 4) West Nile Virus – A new mosquito-borne Disease in Louisiana, and 5) What's the Buzzy About.

U.S. Department of Agriculture  
 Cooperative State Research, Education, and Extension Service  
 Supplement to the Annual Report of Accomplishments and Results  
 Multistate Extension Activities and Integrated Activities

Institution: LSU Agricultural Center

State: Louisiana

Check one:     Multistate Extension Activities  
                    Integrated Activities (Hatch Act Funds)  
                    Integrated Activities (Smith-Lever Act Funds)

| <b>Title of Planned Program/Activity</b>       | <b>Actual Expenditures*<br/>FY2003</b> |
|--|--|
| Aerial Application                             | 14676                                  |
| Aquaculture                                    | 86727                                  |
| Beef   | 95853                                  |
| Commercial Nursery and Landscape Systems       | 23591                                  |
| Commercial Vegetables                          | 12898                                  |
| Cotton   | 41140                                  |
| Dairy  | 56706                                  |
| Economic Development-Community Development     | 42696                                  |
| Economic Development-Leadership and Training   | 30065                                  |
| Economic Development-Promoting Business        | 41202                                  |
| Economic Development-Tourism                   | 46009                                  |
| Economic Development-Workforce Preparation     | 46009                                  |
| EFNEP  | 59940                                  |
| Equine Education                               | 32983                                  |
| Family Economics                               | 72655                                  |
| Farm Asset & Resource Management               | 6960                                   |
| Farm Profits Through Marketing/Farm Management | 27838                                  |
| Food and Nutrition Program (FNP)               | 80056                                  |
| Forest Landowner Education                     | 23350                                  |
| Formosan Subterranean Termite                  | 19569                                  |
| Fruits and Nuts                                | 36986                                  |
| Home Gardens and Grounds                       | 371815                                 |
| Honeybee Management                            | 6671                                   |

(continued on page 214)

\*Expenditure from federal budget (Smith-Lever 3 b,c,d) in FY 2002 was 22.2% of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .222 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.



U.S. Department of Agriculture  
 Cooperative State Research, Education, and Extension Service  
 Supplement to the Annual Report of Accomplishments and Results  
 Multistate Extension Activities and Integrated Activities

Institution: LSU Agricultural Center  
 State: Louisiana

Check one:     Multistate Extension Activities  
                    Integrated Activities (Hatch Act Funds)  
                    Integrated Activities (Smith-Lever Act Funds)

| <b>Title of Planned Program/Activity</b>          | <b>Actual Expenditures*<br/>FY2003</b> |
|---|--|
| Leadership and Volunteer Development              | 96833                                  |
| Managing Risk in a Changing Environment           | 4640                                   |
| Master Wildlifer                                  | 42874                                  |
| Natural Resources/Environmental Education (Youth) | 46254                                  |
| Pesticide Applicator Program                      | 9607                                   |
| Poultry   | 10105                                  |
| Soybeans and Grain Production                     | 56417                                  |
| Underserved Forest Landowner Outreach             | 44475                                  |
| Water Quality                                     | 103361                                 |
| Water Resources Development                       | 17790                                  |
| Weed Science Education                            | 18680                                  |
| Wildlife Extension Outreach                       | 8575                                   |
| Wood Products Outreach                            | 1067                                   |
| Workforce Preparedness                            | 64578                                  |
| <b>Total</b>                                      | <b><u>1801652</u></b>                  |

\_\_\_\_\_  
 Paul Coreil, Director

\_\_\_\_\_  
 03/30/04

\*Expenditure from federal budget (Smith-Lever 3 b,c,d) in FY 2002 was 22.2 % of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .222 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.

U.S. Department of Agriculture  
 Cooperative State Research, Education, and Extension Service  
 Supplement to the Annual Report of Accomplishments and Results  
 Multistate Extension Activities and Integrated Activities

Institution: LSU Agricultural Center  
 State: Louisiana

Check one:     Multistate Extension Activities  
                   Integrated Activities (Hatch Act Funds)  
                   Integrated Activities (Smith-Lever Act Funds)

| <b>Title of Planned Program/Activity</b>       | <b>Actual Expenditures*</b> |
|--|-----------------------------|
|  | <b>FY2003</b>               |
| Aerial Application                             | 8895                        |
| Aquaculture                                    | 53370                       |
| Beef   | 191707                      |
| Commercial Nursery and Landscape Systems       | 19658                       |
| Commercial Vegetables                          | 128979                      |
| Cotton   | 168117                      |
| Dairy  | 64267                       |
| Economic Development-Community Development     | 21348                       |
| Economic Development-Leadership and Training   | 24052                       |
| Economic Development-Promoting Business        | 13734                       |
| Economic Development-Tourism                   | 17167                       |
| Economic Development-Workforce Preparation     | 17167                       |
| EFNEP  | 69382                       |
| Equine Education                               | 34335                       |
| Family Economics                               | 54491                       |
| Farm Asset & Resource Management               | 3430                        |
| Farm Profits Through Marketing/Farm Management | 41787                       |
| Food and Nutrition Program (FNP)               | 80056                       |
| Forest Landowner Education                     | 97846                       |
| Formosan Subterranean Termite                  | 19569                       |
| Fruits and Nuts                                | 99857                       |
| Home Gardens and Grounds                       | 247283                      |
| Honeybee Management                            | 8895                        |

(continued on page 216)

\*Expenditure from federal budget (Smith-Lever 3 b,c,d) in FY 2002 was 22.2% of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .222 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.

U.S. Department of Agriculture  
 Cooperative State Research, Education, and Extension Service  
 Supplement to the Annual Report of Accomplishments and Results  
 Multistate Extension Activities and Integrated Activities

Institution: LSU Agricultural Center  
 State: Louisiana

Check one:     Multistate Extension Activities  
                   Integrated Activities (Hatch Act Funds)  
                   Integrated Activities (Smith-Lever Act Funds)\*

| <b>Title of Planned Program/Activity</b>     | <b>Actual Expenditures*<br/>FY2003</b> |
|--|--|
| Louisiana Forest Products Center Outreach    | 3558                                   |
| Louisiana Rice Research Verification Program | 21793                                  |
| Managing Risk in a Changing Environment      | 5800                                   |
| Master Wildlifer                             | 42874                                  |
| Parenting Skills Education                   | 28286                                  |
| Pasture, Forage, and Small Grains            | 43764                                  |
| Poultry                                      | 25262                                  |
| Soybeans and Grain Production                | 225935                                 |
| Sugarcane Burn Management                    | 6671                                   |
| Underserved Forest Landowner Outreach        | 44475                                  |
| Water Quality                                | 22238                                  |
| Water Resources Development                  | 17790                                  |
| Weed Science Education                       | 348156                                 |
| Wildlife Extension Outreach                  | 33979                                  |
| Wood Products Outreach                       | 7116                                   |
| <b>Total</b>                                 | <b><u>2362999</u></b>                  |

\_\_\_\_\_  
 Paul Coreil, Director

\_\_\_\_\_  
 03/30/04

Expenditure from federal budget (Smith-Lever 3 b,c,d) in FY 2002 was 22.2% of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .222 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.

U.S. Department of Agriculture  
 Cooperative State Research, Education, and Extension Service  
 Supplement to the Annual Report of Accomplishments and Results  
 Multistate Extension Activities and Integrated Activities

Institution: LSU Agricultural Center  
 State: Louisiana

Check one:     Multistate Extension Activities  
                    Integrated Activities (Hatch Act Funds)  
                    Integrated Activities (Smith-Lever Act Funds)

| <b>Title of Planned Program/Activity</b>             | <b>Actual Expenditures<br/>FY2003</b> |
|--|---------------------------------------|
| Farm Production Budgets/Market Economics             | 195,642                               |
| Crop Genetics/Variety Trials/Variety Recommendations | 197,909                               |
| Insecticide Efficacy/Insecticide Recommendations     | 202,258                               |
| Herbicide Efficacy/Herbicide Recommendations         | 76,558                                |
| Plant Health/Treatment Recommendations               | 257,583                               |
| Food Processing/Packaging/Safety                     | 31,810                                |
| Animal Health/Treatment Recommendations              | 13,083                                |
| Soil Testing/Fertility Recommendations               | 48,397                                |
| Animal Waste Management                              | 66,888                                |
| <br>   |                                       |
| Total  | <u>1,090,128</u>                      |

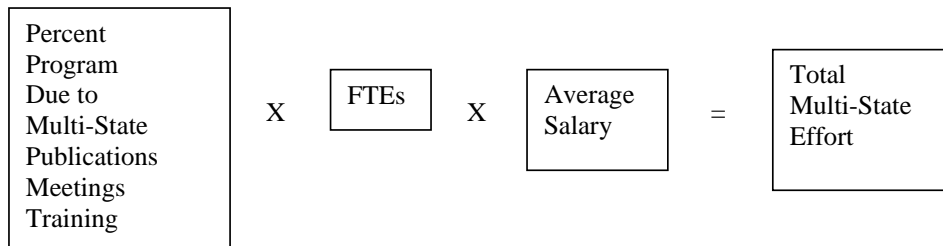
\_\_\_\_\_  
 David J. Boethel, Director

\_\_\_\_\_  
 03/30/04

**MULTI-STATE AND MULTI-FUNCTION BRIEFS**

The LSU AgCenter is fully engaged with other institutions. Many of the materials, ideas and programs have come from other states. The free sharing of materials, ideas and programs at regional and national scientific meetings is the strength of the Land Grant System. Many specialists assist with agent and producer training in the surrounding states and those efforts are expanding continually. Additionally, all of the recommendations and programs are research-based and research personnel are used extensively in developing recommendations, publications, training agents and producer meetings.

To determine multi-state work, each specialist estimated the percentage of material, ideas or program that were obtained from other states through publications or meetings. The percent multi-state effort was multiplied by the number of FTEs devoted to the program times the average salary per FTE.



This calculation indicates the total multi-state effort. The federal expenditure on multi-state programs is the actual amount of federal funds devoted to the faculty delivering the program. A similar logic model and calculation was used for integrated activities.

The reports for multi-state and integrated activities are included in the body of the report. The total multi-state and integrated activity and the federal funds accounted for are listed below.

|                      | <b><u>Total</u></b> | <b><u>Federal Portion Accounted For</u></b> |
|----------------------|---------------------|---|
| Multi-State Activity | 8,115,559           | 1,801,652                                   |
| Integrated Activity  | 10,644,643          | 2,362,999                                   |

**Appendix 2****FY 2003 LSU Ag Center Annual Report for USDA-CSREES  
Guidance on Preparation of Extension Program Reports**

The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:

**Goal 1.** An organized agricultural system that is highly competitive in the global economy.

**Goal 2.** A safe and secure food and fiber system.

**Goal 3.** A healthy, well-nourished population.

**Goal 4.** Greater harmony between agriculture and the environment.

**Goal 5.** Enhanced economic opportunity and quality of life for Americans.

Extension programs included in the report under each of the five goals are to be prepared in a specific format. The format is indicated below along with explanation of the procedure to be followed and the supporting/explanatory material to be used in developing reports of extension programs.

- 1. Title of Extension Program:** Specify the title of the reported program (Example: Dairy, Beef, Master Farmer, Economic Development, Water Management, etc.). Last year's annual report to USDA-CSREES included 41 extension programs as shown in Appendix 1.
- 2. Federal Goal:** Indicate goal number (1, 2, 3, 4, 5, or "Other" if program does not match any of the five goals).
- 3. Key Theme:** Select an appropriate theme related to the extension program from the list of themes specified for each goal (List at Appendix 3)
- 4. Description of the Program:** Describe what was done in (or progress of) the program during the reporting year (FY 03) on the following items:

**Stakeholder Input in Program.** Describe what was done to seek and use input from the program's stakeholders (individuals, groups, and organizations with a vested interest in the program and/or who are affected in some way by the program). Include the following information:

- 4.1.1.** Actions taken to seek stakeholder input that encourages their participation;
- 4.1.2.** The process used to identify individuals, groups, and organizations who are stakeholders and to collect input from them;
  - 4.1.2.** How collected input was considered.

**Problem (s) Identified.** Specify the problems identified through stakeholder input that were addressed in the program.

**Initiation and Progress of the Program.** Describe how the program was initiated and what progress was made during the year to address the identified problems. Include major educational activities planned and implemented (meetings, workshops, seminars,

demonstrations, field days, mass media used and contacts made, publications distributed, etc.), extent of clientele participation in these activities, and short-term outcomes of these activities such as clientele reactions (satisfaction with and intentions/plans to use information, etc.)

***Collaboration.*** List groups, agencies, and organizations collaborating with Extension/Ag Center in the program in both a formal and informal manner and briefly indicate nature of collaboration (roles, responsibilities, etc. of collaborators and Extension/Ag Center).

***Impact of Program.*** Describe briefly impact of the program, i.e., (a) changes made by program participants in their knowledge, skills, attitudes, and aspirations, (b) adoption of new ideas and practices, and/or (c) the social, economic, and environmental consequences for communities. These are higher level outcomes of programs which are important to report to answer the question of what happened to targeted clientele (individuals and communities) as a result of the program, i.e. what difference did the program make? The Extension Planning and Reporting System (PARS) contains program outcomes for FY2002 as reported by agents. These outcome statements are in the form of “bullets”; they do not provide details of the programs. Program outcomes, by base program, will be available on the Institutional Research and Organizational Development Unit (IROD) web page at <http://www.lsuagcenter.net/irod/Outcomes/outtcomelst.htm>. This information may be used as deemed appropriate in this section of the report. However, one cannot rely on these outcome reports only; faculty will have to draw upon their own knowledge and experience of the program for which they are providing statewide leadership.

***Source of Funds.*** Indicate Smith-Lever 3 b,c (federal funds) or specific grant funds

***Scope of Impact:*** Indicate if the program’s impact is (a) confined to Louisiana or involved other states (multi-state), and (b) multi-function (extent to which research and extension are integrated). *It is very important that special attention is paid to these aspects of the report. Continued federal funding (Smith-Lever for extension and Hatch for research) is dependent on our ability to substantiate with valid and auditable data the commitment made by the LSU Ag Center that 25% of federal funds received are being used for multi-state and 25% for multi-function programming*

**For multi-state impact programs:** (a) list states involved in the program in such activities as program planning, participation in meetings, preparation and sharing of educational materials, training of extension personnel, and evaluation, and (b) estimate percentage of the Louisiana program that resulted from the above multi-state efforts by way of ideas used, publications prepared, meetings held, trained, parish level educational programs offered, and evaluative activities.

Use the following formula to calculate the dollar equivalent of the multi-state share of the program:

**Multi-state \$ = [ (Estimated % of program attributed to multi-state collaboration) x (Number of Extension professional FTEs devoted to the program from PARS) x (Dollar equivalent of 1 Extension professional FTE)]**

**Example (FY 2002 report):**

**Cotton: Participation and information-sharing from the Beltwide Cotton Conferences was responsible for 25% of the cotton education program in Louisiana. A total of 8.3 FTEs was devoted to the cotton program. Hence, the dollar value of the multi-state effort = [.25 (% of program) x 8.3 (FTEs) x 80,136 (\$ equivalent of 1 Extension professional FTE)] = \$166,182.**

***For multi-function programs:* If the program is based in or the result of integrated research-extension efforts (recommendations, publications, training, or planning, implementation, and evaluation of programs resulting from research-extension collaboration), indicate appropriate percentage of such integrated effort in the resulting extension program.**

**Use the following formula to calculate the dollar equivalent of the multi-function (integrated research-extension) share of the program:**

**Multi-function \$ = [ (Estimated % of program attributed to research-extension) x (Number of Extension professional FTEs devoted to the program from PARS) x (Dollar equivalent of 1 Extension professional FTE)]**

**Example (FY 2002 report):**

**Soybean and Grain Production: Multi-function (integrated research-extension) efforts are estimated at 35% of the total number of FTEs expended in the program. These efforts include research-extension collaboration in agent training, formulation of recommendations, publications, and field trouble shooting during the growing season. The dollar value of this multi-function effort = [.35 (estimated % of program) x 6.5 (FTEs devoted to soybean program) x 80,136 (\$ equivalent of 1 Extension professional FTE)] = \$182,309.**

**Note: Examples of extension program reports under the different federal goals may be reviewed in the LSU Ag Center Annual Report for FY 2002 at:**

**[http://www.lsuagcenter.net/irod/federal\\_report.htm](http://www.lsuagcenter.net/irod/federal_report.htm).**



## Appendix 1

FY 2003 LSU Ag Center Annual Report for USDA-CSREES  
Guidance on Preparation of Research Project Reports

The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:

- Goal 1.* An organized agricultural system that is highly competitive in the global economy.
- Goal 2.* A safe and secure food and fiber system.
- Goal 3.* A healthy, well-nourished population.
- Goal 4.* Greater harmony between agriculture and the environment.
- Goal 5.* Enhanced economic opportunity and quality of life for Americans.

Reports of research projects under each of the five goals are to be prepared in a specific format. The format is indicated below along with explanation of the procedure to be followed and the supporting/explanatory material to be used in developing reports of research projects.

*Title of Research Project:* Specify the title of the research project being reported.

*Federal Goal:* Indicate goal number (1, 2, 3, 4, 5).

*Key Theme:* Select an appropriate theme related to the research project from the list of themes specified for each goal (List at Appendix 3)

*Issue:* Describe the issue that the project addresses

*What was done:* Describe what was done in (or progress of) the project during the reporting year (FY 03).

*Impact:* Describe the impact of the program in terms of benefits and the stakeholders who are affected.

*Sources of Funding:* Specify whether funds expended are from Hatch, State, Multi-state, or combinations of these sources.

Note: Examples of research project reports under the different federal goals may be reviewed in the LSU Ag Center Annual Report for FY 2002 at

[http://www.lsuagcenter.net/irod/federal\\_report.htm](http://www.lsuagcenter.net/irod/federal_report.htm).

GOAL 3 EXTENSION SUMMARIES: Federal Goal 3

FOOD AND NUTRITION PROGRAM (FNP)

## Key Theme: Human Nutrition

### Program Description

Extension Family and Consumer Science agents covering 35 parishes and 15 nutrition educators in targeted parishes conduct Family Nutrition Programs (FNP) to assist food stamp recipients and potential food stamp recipients improve their diets and budget their food dollar. All FNP parishes have been actively involved in community education and outreach programs. Twenty parishes have a paraprofessional to help conduct the FNP program. The main nutrition topics covered by FNP included the Food Guide Pyramid, Dietary Guidelines for Americans, fruits and vegetables, fats, physical activity, healthy weight, food safety, and food buying/budgeting. A monthly newsletter covered different nutrition topics: physical activity, fats, nutritional content and benefits of different foods (fish, milk, potatoes, cereal), and commodity foods (canned fruits, canned meats). Reported sites for the FNP outreach program included commodity distribution sites, eligible low income schools, WIC clinics, and Head Start centers.

The most significant achievement for FNP during FY 2003 was the collaboration with eligible schools, the reaching and educating low-income children about nutrition, healthy eating habits and importance of regular physical activity. During FY 03, a total of 39,443 eligible youth (32% of total 123,066 FNP audience) were reached through FNP.

FNP participants play a significant role in the planning and development of nutrition education outreach. Food Stamp recipients are surveyed regarding selected demographics, age of members in the family, and areas of interest for nutrition education. Providing program delivery in the local Food Stamp office allowed the eligibility caseworkers and office staff to have ongoing input on the objectives and goals of the program. Low-income families were members of program advisory councils and curricula review teams to assure the needs of the target audience were met.

A program enrollment form was used to survey the needs of all enrolled participants, encouraging direct client impact on the subsequent delivery of nutrition education topics.

FNP program faculty received a list of parish Food Stamp recipients. The 35 FNP parishes provided direct contact with selected Food Stamp recipients with telephone numbers and current address to offer access to the program and to collect input. The Office of Family Support provided ongoing monitoring and input regarding the needs of the Food Stamp recipients.

Enrollment forms and phone consultations indicated the most popular and requested nutrition education topics as suggested by the stakeholders and additional teaching resources and training was provided field faculty to deliver these identified programs. Additional programs were conducted to meet the increased demand for selected topics. FNP enrollment data in 2002-2003 included gender, race, education, number of children, health conditions identified by the client, participation in assistance programs, and lessons received. Program planning incorporated this information to meet the identified needs of the target audience. From October 1, 2002 through September 2003, 12,048 clients were enrolled.

State agencies that worked closely with the FNP program to enhance programs and improve community impact were the Governor's Office of Elderly Affairs, the Department of Education, the Department of Public Health, the Department of Health and Hospitals, the US Dept of Agriculture, the Association of Independent Grocers, and the Southeastern Dairy Association.

The LSU School of Human Ecology collaborated with FNP and EFNEP to develop evaluation protocols, a nutrition research teaching nutrition lab, and preceptor supervision for dietetic interns.

The EFNEP and FSNEP Coordinators from 1860 and 1890 Extension Services in LA, TX, MS, AR, OK, TN, KY, VA, NC, SC, GA, FL, AL, and Puerto Rico collaborated on program design, implementation, and evaluation.

The Texas Agricultural Extension Service worked closely with FNP to guide the EATSMART: Eat for Better Health Nutrition Assistant Certification program.

### Program Impact

Extension agents in 35 parishes and the 15 FNP nutrition educators reached over 123,066 people with information on nutrition, diets and health, and food buying through the FNP program (50,355 direct contacts and 72,711 indirect contacts).

Main topics covered through nutrition education activities included nutrition/diet/health, food safety, and food buying/budgeting. The most frequently reported sites for outreach and nutrition education in the parishes include Office of Family Support, Commodity Food Distribution sites, schools and housing developments.

Impact statement data from parishes showed that after participating in FNP, the vast majority of individuals indicated that they learned about several nutrition and health-related concepts. More specifically, over three-fourths of those surveyed indicated that they learned to read the nutrition labels to make health food choices, the importance of adequate nutrition for the child's development, and to use the food guide pyramid when planning meals for the family. Additionally, over half of individuals surveyed indicated that they learned to choose a diet abundant in fruits and vegetables, with at least 2 servings of low-fat dairy products, moderate in sugar, and lower in salt after participating in FNP. On the other hand, twenty out of 114 surveyed indicated that they did not learned to choose a diet moderate in sugar and about the same number of individuals indicated that they obtained this knowledge prior to FNP participation. 30% of surveyed individuals indicated that they learned, through participation in FNP, the importance of completing 30 minutes of moderate exercise most days of the week.

### NUTRITION EDUCATION THROUGH 4-H SUMMER CAMP

As part of the state childhood obesity prevention initiative, Louisiana State University Agricultural Center (LSU AgCenter) nutrition and 4-H Agents conducted nutrition education sessions for 4-H club members (from low-income schools) during a 10-week summer camp. The

purpose of the nutrition program during the summer camp was to educate youth about the importance of healthy eating and regular physical activity in prevention of overweight and obesity.

One-hour nutrition sessions were conducted 3 times a day, for 3 days each week. Different groups of low income 4-H'ers participated in each session. The Health assembly program was used as teaching material. The nutrition program addressed four topics: making low-fat choices, eating high-fiber foods, drinking lots of water, and exercising regularly. Before each session all participants completed a pre-test (five questions) that addressed different nutrition topics covered by the "Basic Training for Better Health" program. The same test was given to all participants after the session (post-test).

A total of 3,722 children (1,419 boys and 2,303 girls) were reached during the 10-week period. A total of 2,193 children (59%) of those attending camp completed and returned the pre and post-tests

Source of Funds

State and Federal (Smith-Lever 3 b, c, d)

Family Nutrition Program (FNP), Food Stamp Nutrition Education Program funded by USDA, Food Nutrition Services (FNS), through the Louisiana Department of Social Services, Office of Family Support, Food Stamp Program

Scope of Impact

Multi-state: The Family Nutrition Program (FNP) is part of the National Food Stamp Nutrition Education Program sponsored by USDA, Food and Nutrition Service. The EFNEP and FSNEP Coordinators from 1860 and 1890 Extension Services of the Southern Region of CSREES meet at several annual meetings and monthly via conference calls to plan and coordinate the southern region's nutrition education outreach for low-income families. An electronic list-serv provides an excellent medium for daily communications regarding curricula selections, staff training and supervision, and reporting and evaluations between the 14 Southern Region CSREES states: LA, TX, MS, AR, OK, TN, KY, VA, NC, SC, GA, FL, AL, and Puerto Rico.

Louisiana EFNEP and FNP faculty contributed to a web based paraprofessional training curriculum, Eat Smart. The web based training curriculum includes more than 25 nutrition education modules that are available through Internet access to Louisiana and other states. The training program incorporates pre and post-test components and provides the basis of the Nutrition Assistant Civil Service Certification program. In addition to the Internet curriculum, a workbook developed by the Texas Agricultural Extension Service serves as an additional tool to assist the nutrition educators in the certification process. The information in the manual complements the Internet curriculum and is used as a supplement to enhance learning.

In FY 2003, an estimated 15 FTEs were spent on Food Stamp Nutrition education, resulting in 123,066 contacts. Based on an FTE cost of \$80,136, the total cost of the program was

\$1,202,040. Of this effort, 30% is involved in the acquisition of sharing of resources and information through multi-state efforts, valued at \$360,612. (15 FTEs x \$80,136 per FTE x .30).

Multi-function: State agencies that work closely with the FNP program are the Governor's Office of Elderly Affairs, the Department of Education, the Department of Public Health, the Department of Health and Hospitals, the US Dept of Agriculture, the Association of Independent Grocers, and the Southeastern Dairy Association. These agencies work closely with FNP to enhance our programs and improve our community impact.

The LSU School of Human Ecology has collaborated with FNP and EFNEP to develop evaluation protocols, a nutrition research-teaching lab, and preceptor supervision for dietetic interns.

Contributions from research counterparts included assistance in determining program needs through focus groups, meetings, development of nutrition education materials, agent training and presentations for clientele. It is estimated that 30% of FTE allocations to this program is attributable to multi-function work. The dollar equivalent of multi-function work is \$360,612 (15 FTEs x \$80,136 per FTE x .30)

Appendix 2

#### FY 2003 LSU Ag Center Annual Report for USDA-CSREES Guidance on Preparation of Extension Program Reports

The LSU Ag Center annual report of research and extension programs to be submitted to USDA-CSREES will be focused on the following five national goals within the Research, Education, and Economics (REE) Mission Area of USDA:

- Goal 1.* An organized agricultural system that is highly competitive in the global economy.
- Goal 2.* A safe and secure food and fiber system.
- Goal 3.* A healthy, well-nourished population.
- Goal 4.* Greater harmony between agriculture and the environment.
- Goal 5.* Enhanced economic opportunity and quality of life for Americans.

Extension programs included in the report under each of the five goals are to be prepared in a specific format. The format is indicated below along with explanation of the procedure to be followed and the supporting/explanatory material to be used in developing reports of extension programs.

- 1. Title of Extension Program:* Specify the title of the reported program (Example: Dairy, Beef, Master Farmer, Economic Development, Water Management, etc.). Last year's annual report to USDA-CSREES included 41 extension programs as shown in Appendix 1.
- 2. Federal Goal:* Indicate goal number (1, 2, 3, 4, 5, or "Other" if program does not match any of the five goals).
- 3. Key Theme:* Select an appropriate theme related to the extension program from the list of themes specified for each goal (List at Appendix 3)

*4. Description of the Program:* Describe what was done in (or progress of) the program during the reporting year (FY 03) on the following items:

*Stakeholder Input in Program.* Describe what was done to seek and use input from the program's stakeholders (individuals, groups, and organizations with a vested interest in the program and/or who are affected in some way by the program). Include the following information:

- 4.1.1. Actions taken to seek stakeholder input that encourages their participation;
- 4.1.2. The process used to identify individuals, groups, and organizations who are stakeholders and to collect input from them;
- 4.1.2. How collected input was considered.

*Problem (s) Identified.* Specify the problems identified through stakeholder input that were addressed in the program.

*Initiation and Progress of the Program.* Describe how the program was initiated and what progress was made during the year to address the identified problems. Include major educational activities planned and implemented (meetings, workshops, seminars, demonstrations, field days, mass media used and contacts made, publications distributed, etc.), extent of clientele participation in these activities, and short-term outcomes of these activities such as clientele reactions (satisfaction with and intentions/plans to use information, etc.)

*Collaboration.* List groups, agencies, and organizations collaborating with Extension/Ag Center in the program in both a formal and informal manner and briefly indicate nature of collaboration (roles, responsibilities, etc. of collaborators and Extension/Ag Center).

*Impact of Program.* Describe briefly impact of the program, i.e., (a) changes made by program participants in their knowledge, skills, attitudes, and aspirations, (b) adoption of new ideas and practices, and/or (c) the social, economic, and environmental consequences for communities. These are higher level outcomes of programs which are important to report to answer the question of what happened to targeted clientele (individuals and communities) as a result of the program, i.e. what difference did the program make? The Extension Planning and Reporting System (PARS) contains program outcomes for FY2002 as reported by agents. These outcome statements are in the form of "bullets"; they do not provide details of the programs. Program outcomes, by base program, will be available on the Institutional Research and Organizational Development Unit (IROD) web page at <http://www.lsuagcenter.net/irod/Outcomes/outcomelst.htm>. This information may be used as deemed appropriate in this section of the report. However, one cannot rely on these outcome reports only; faculty will have to draw upon their own knowledge and experience of the program for which they are providing statewide leadership.

*Source of Funds.* Indicate Smith-Lever 3 b,c (federal funds) or specific grant funds

*Scope of Impact:* Indicate if the program's impact is (a) confined to Louisiana or involved other states (multi-state), and (b) multi-function (extent to which research and extension are

integrated). *It is very important that special attention is paid to these aspects of the report. Continued federal funding (Smith-Lever for extension and Hatch for research) is dependent on our ability to substantiate with valid and auditable data the commitment made by the LSU Ag Center that 25% of federal funds received are being used for multi-state and 25% for multi-function programming*

For multi-state impact programs: (a) list states involved in the program in such activities as program planning, participation in meetings, preparation and sharing of educational materials, training of extension personnel, and evaluation, and (b) estimate percentage of the Louisiana program that resulted from the above multi-state efforts by way of ideas used, publications prepared, meetings held, trained, parish level educational programs offered, and evaluative activities.

Use the following formula to calculate the dollar equivalent of the multi-state share of the program:

Multi-state \$ = [ (Estimated % of program attributed to multi-state collaboration) x (Number of Extension professional FTEs devoted to the program from PARS) x (Dollar equivalent of 1 Extension professional FTE)]

Example (FY 2002 report):

Cotton: Participation and information-sharing from the Beltwide Cotton Conferences was responsible for 25% of the cotton education program in Louisiana. A total of 8.3 FTEs was devoted to the cotton program. Hence, the dollar value of the multi-state effort = [.25 (% of program) x 8.3 (FTEs) x 80,136 (\$ equivalent of 1 Extension professional FTE)] = \$166,182.

For multi-function programs: If the program is based in or the result of integrated research-extension efforts (recommendations, publications, training, or planning, implementation, and evaluation of programs resulting from research-extension collaboration), indicate appropriate percentage of such integrated effort in the resulting extension program.

Use the following formula to calculate the dollar equivalent of the multi-function (integrated research-extension) share of the program:

Multi-function \$ = [ (Estimated % of program attributed to research-extension) x (Number of Extension professional FTEs devoted to the program from PARS) x (Dollar equivalent of 1 Extension professional FTE)]

Example (FY 2002 report):

Soybean and Grain Production: Multi-function (integrated research-extension) efforts are estimated at 35% of the total number of FTEs expended in the program. These efforts include research-extension collaboration in agent training, formulation of recommendations, publications, and field trouble shooting during the growing season. The dollar value of this

multi-function effort = [.35 (estimated % of program) x 6.5 (FTEs devoted to soybean program) x 80,136 (\$ equivalent of 1 Extension professional FTE)] = \$182,309.

Note: Examples of extension program reports under the different federal goals may be reviewed in the LSU Ag Center Annual Report for FY 2002 at:

[http://www.lsuagcenter.net/irod/federal\\_report.htm](http://www.lsuagcenter.net/irod/federal_report.htm).

---

Section Break (Next Page)



## Appendix 3

### Five-Year Plan of Work (FY 2000 - FY 2004) Key Themes

#### Goal 1

Adding Value to New and Old Agricultural Products

Agricultural Competitiveness

Agricultural Profitability

Animal Genomics

Animal Health

Animal Production Efficiency

Apiculture

Aquaculture

Biobased Products

Biofuels

Biotechnology

Bioterrorism

Diversified/Alternative Agriculture

Emerging Infectious Diseases

GIS/GPS

Grazing

Home Lawn and Gardening

Innovative Farming Techniques

Invasive Species

Managing Change in Agriculture

New Uses for Agricultural Products

Niche Market

Organic Agriculture

Ornamental/Green Agriculture

Plant Genomics

Plant Germplasm

Plant Health

Plant Production Efficiency

Precision Agriculture

Rangeland/Pasture Management

Risk Management

Small Farm Viability

Tropical Agriculture

Urban Gardening

#### Goal 2

Food Accessibility and Affordability

Food Handling

Food Quality

Food Recovery/Gleaning

Food Resource Management  
Food Safety  
Food Security  
Foodborne Illness  
Foodborne Pathogen Protection  
HACCP

### Goal 3

Birth Weight  
Health Care  
Human Health  
Human Nutrition  
Infant Mortality  
Medicinal Plants  
Nutricueticals

### Goal 4

Agricultural Waste Management  
Air Quality  
Biodiversity  
Biological Control  
Drought Prevention and Mitigation  
Endangered Species  
Energy Conservation  
Forest Crops  
Forest Resource Management  
Global Change and Climate Change  
Hazardous Materials  
Integrated Pest Management  
Land Use  
Natural Resources Management  
Nutrient Management  
Permaculture Land Management  
Pesticide Application  
Recycling  
Riparian Management  
Soil Erosion  
Soil Quality  
Sustainable Agriculture  
Water Quality  
Weather and Climate  
Wetlands Restoration and Protection  
Wildfire Science and Management  
Wildlife Management

## Yard Waste/Composting

### Goal 5

Aging  
Agricultural Financial Management  
Character/Ethics Education  
Child Care/Dependent Care  
Children, Youth, and Families at Risk  
Communications Skills  
Community Development  
Conflict Management  
Consumer Management  
Estate Planning  
Family Resource Management  
Farm Safety  
Fire Safety  
Home Safety  
Home-based Business Education  
Impact of Change on Rural Communities  
Jobs/Employment  
Leadership Training and Development  
Literacy  
Parenting  
Promoting Business Programs  
Promoting Housing Programs  
Retirement Planning  
Supplemental Income Strategies  
Tourism  
Workforce Preparation - Youth and Adult  
Workforce Safety  
Youth Development/4-H  
Youth Farm Safety