Louisiana State University Agricultural Center

Annual Report, FY 2006

October 1, 2005-September 30, 2006

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Louisiana State University Agricultural Center

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Louisiana State University Agricultural Center
Annual Report, FY 2006
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Overview

The mission of the LSU Agricultural Center is to enhance the quality of life for the people of Louisiana through research and education programs that develop the best use of natural resources, conserve and protect the environment, enhance the 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 legislative bodies.

In realizing this mission, the LSU Agricultural Center in FY 2005 directed research and extension 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). This report updates information about several of the ongoing programs which were included in previous year's reports and provides information on new initiatives and projects undertaken during FY 2006. Research projects and extension reports are included under each goal. The reports are followed by information about the processes used for stakeholder input and merit review of programs, and allocation of federal appropriations to multi-state and multi-function activities.

The five federal goals under which accomplishments are reported are as follows:

Goal 1 – An organized agricultural system that is highly competitive in the global market

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

Research Project Summary

Louisiana Agricultural Experiment Station scientists, located on the Louisiana State University and Agricultural and Mechanical College campus and at branch Research Stations located across the state, continue to serve stakeholders by conducting research relevant to Louisiana agriculture. Research results are disseminated to producers, consultants, agribusiness, government agencies, and other stakeholders, both directly and through extension educators. With a considerable number of farmers now using a computer as an integral part of their operation, in FY 2006, 5,268,904 visits were made to the LSU AgCenter web site. Six new research publications were released, one of which is available on-line. Additionally, one research publication was revised.

Extension Program Summary

Education programs of the Louisiana Cooperative Extension Service were conducted in all five federal goals. In FY 2006, professional Full Time Equivalents (FTEs) totaled 333.16, and 3,659,769 educational contacts were made. The distribution of professional FTEs and educational contacts by federal goal was as follows:

Federal Goal	Number of Extension FTEs	Educational contacts
1	100.8	782267
2	6.36	101406
3	60.21	825996
4	16.38	85150
5	149.41	1864950
Total	333.16	3,659,769

The LSU AgCenter technology initiative has led to increased usage of its web site to supplement the traditional print method of educational information dissemination. A number of printed publications have now been placed on-line for extension stakeholders to access, download, and/or print copies to meet their needs. A monitoring system to record stakeholder use has been developed, and in FY 2006, 5,268,904 visits were made to the AgCenter web site. These on-line visits are in addition to the educational contacts noted in the table above. Although on-line educational material is now in demand by our stakeholders, print media continues to be widely used. Printed publications on a wide range of topics were issued for dissemination to adult and youth stakeholders in support of educational programs. Sixty-two publications were developed, 13 publications were reprinted, and 28 publications were revised. Twenty-nine of these publications are available on-line.

Goal 1 – Extension Program Reports

Cotton Insect Pest Management Educational Programs

Ralph Bagwell **Entomology**

Key Theme: Integrated Pest Management

The objective of cotton insect management educational programs is to maintain production at a profitable level by reducing insect pests to the point they cause no economic losses. Program needs were identified by stakeholder meetings, county agent meetings and one on one interaction with stakeholders. Educational programs are then designed to address these needs. These IPM programs are based on a cotton IPM program that manages insects at reasonable costs with minimum adverse effects on human health and the environment. Such a blend of chemical and non-chemical insect control practices provides insect control with the minimum amount of insecticides and results in more efficient control of the pest insects.
The latest technology in cotton IPM was disseminated to the cotton industry in Louisiana. Educational efforts included result demonstrations, county agent training sessions, producer meetings, professional meetings, and through newsletters. Specifically, there were 15 result demonstrations conducted on recommended scouting procedures, treatment thresholds, application techniques, cultural control options, and biological control. Sampling methods and threshold development demonstrations were also conducted as a multi-state project involving representatives from the University of Arkansas, Mississippi State University and the University of Tennessee. These studies were designed to address the most pressing need for cotton IPM in the mid-southern United States, that is, bug pests of cotton. There were 34 presentations on cotton IPM at local and national grower meetings. These presentations focused on sampling and management of bug pests in cotton. Cotton IPM education was also disseminated through 8 publications. Publications topics ranged from the current insect status to management recommendations for cotton insects.

100% of Louisiana's cotton is produced using IPM techniques. Insect control costs for Louisiana cotton in 2006 were $90.54/acre or $56,587,500 for the state. If Louisiana's cotton crop was produced without IPM, insect control costs would be at least $160.94/acre or $100,587,500 statewide. Thus, IPM saved Louisiana's cotton producers at least $70.40/acre or $44,000,000. Specific program impacts include: 1) Over 95% of Louisiana cotton is produced using IPM techniques; 2) Over 2,500 contacts from the cotton industry were educated at various producer meetings and field days; 3) Over 30 cotton scouts were trained in proper scouting procedures and insect pest identification; 4) 15 county agents were trained on cotton IPM at county agent training; and 5) Cotton insect control recommendations were distributed to over 500 recipients either electronically or in printed form. This program is multi-state and involves land grant institutions in the following states: Alabama, Arizona, Arkansas, California, Georgia, Missouri, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

Source of Funds

Smith-Lever 3 b, c
Private industry

Scope of Impact

Multi-state: Fifteen percent of the program is a result of multi-state meetings and materials. 0.85 FTEs were devoted to the cotton IPM effort. Therefore the dollar value of the multi-state effort = [(15% multi-state)(0.85 FTE)($80,136/FTE)] = $10,217.

Multi-function: Twenty percent of the program is a result of multi-function programming. At 0.85 FTEs devoted to cotton IPM the dollar value of the multi-function effort = [(20%)(0.85 FTE)($80,136/FTE) = $13,623.

eXtension Horse Quest

Clinton G. Depew Animal Sciences

Key Theme: Animal Production Efficiency

The widespread use and availability of the internet has created new and emerging opportunities for educational programs and the opportunity to deliver science based information to vast numbers of people almost instantaneously. Our clientele have adopted the new technology to explore the science and production of horses. Therefore, the need for educational programs delivered via web based programming has become critical. Additionally, web based programming has created instance access to millions of customers not normally available and clientele have an opportunity to access experts outside of their immediate area. The need for factual, research based information via the internet is critical to the horse audience. The audience varies from youth to new owners to mature horse producers with extensive knowledge and experience. Therefore, Extension has the opportunity to provide quality information to a new and vast audience in a very timely manner.

As a result of the opportunities with new technology and vast audiences that are untapped in the horse industry, the Southern Regional Horse Specialists met to develop programs to address the needs of this industry. A web-based right now technology program was begun called Horse Quest that ultimately expanded into the National eXtension effort. Ultimately approximately 45 horse specialists, veterinarians, researchers and agents came together to develop and maintain the Horse Quest website. Modules were developed that covered horse care and management, a new horse owner guide, pasture management, body condition scoring and others. These modules were designed to take care of the basic educational needs of the average horse owner. Additionally, a best of the best research information project has begun that provides technical information on nutrition, reproduction, genetics and other topics for the horse producer that needs more in depth information. A frequently asked questions section was developed to answer clientele questions on nutrition, health, training and behavior, etc. One of the key features of that section is the ask the expert opportunity where clientele can ask specific questions to experts around the country. These questions are assigned to various experts based on their areas of expertise. Additionally, 4 horse chats a year have been conducted on the internet to allow clientele immediate access to the experts at designated times on designated topics. Online credit courses from major universities are a featured part of the new programming for those horsemen who want in depth knowledge and training in certain particular areas and for those seeking credit for their learning.

The eXtension national effort was launched in the fall of 2006 and had 5,325 unique visitors, 7694 visits (1.44 per visitor), with 49,294 pages visited for a total of 347,943 hits in the first month of operation. As advertisements became more prominent in horse magazines and eXtension new releases were circulated those contacts have grown to 13,182 unique visitors, 17,726 visits, 72,066 pages visited and a total of 564,271 total hits in January of 2007. Five hundred sixty six frequently asked questions have been viewed and visitors have indicated about a 99% satisfaction rate on the materials they viewed. Most visitors find the information they desired on the site and only about 1% ask additional questions to experts.

Source of Funds

The Horse Quest program has been primarily funded by grants, starting with $60,000 grant from USDA’s Communication section to develop the initial website presence which was called Horse Quest. An additional $75,000 was obtained from the Extension system when the Horse Quest became part of the national initiative and an additional $25,000 was obtained from the Extension grant program for the continuing development of the program for 2007. In addition to the grants, each state has supported its specialists with income assistance for their time and travel. This project has been 100% multi-state program from the beginning with 13 states involved. At the present time 29 states and 32 institutions states are participating. Approximately 25% of the experts have been research oriented.

Scope of Impact

Multi-state: This project has been 100% multi-state program from the beginning with 13 states involved. At the present time 29 states and 32 institutions states are participating.

1.2 FTES were devoted to the eXtension horse effort, with an FTE valued at $80, 136. Therefore, the dollar value of the multi-state effort was $96,163.

Multi Function:

Efforts are estimated at 35% of the total numbers of FTEs expended in the program. These efforts included research efforts in developing modules, answering questions, and planning for growth and expansion of the project. The dollar value of the multi-function effort is $.70,119. (2.5 FTEs X 80,136 per FTE X .35).

Assisting Producers Adjust To Changing Production and Marketing Environments

Kurt Guidry, Gene Johnson, John Westra, Mike Salassi, Ken Paxton; Ag Economics and Agribusiness

Key Theme: Managing Change in Agriculture

Agricultural producers must constantly address changes in production environments, marketing environments, and policy environments. With these changes comes a certain level or risks. Whether it be weather conditions that increase the risk of lower crop production, changes in commodity markets that increase the risk of unprofitable price levels, or changes in government policy that increase the risk of lower farm incomes, producers who are to remain viable must efficiently and effectively address those changes and manage the associated risk. As such, effective extension programs must provide producers, through a variety of delivery strategies that assist them in making informed decisions. Making sound, informed, and research based decisions has become a more critical issue as rising input costs and stagnant market prices have reduced overall profit margins. With ever decreasing profit margins, making wrong decisions can have long term impacts on the operation.

In an attempt to provide producers with sound information to make informed decisions, Extension personnel within the Department of Agricultural Economics and Agribusiness have utilized a variety of delivery methods and have addressed a variety of issues. In the area of marketing, personnel conducted more than 50 producer meetings discussing market outlook and marketing strategies. In addition, market newsletters are utilized and delivered through field staff and directly to producers. In addition to market update newsletters, other information such as price information, cyclical price trends, supply and demand changes and government program payments are delivered through this same newsletter format. In the area of farm management, one of the major endeavors is the development of over 150 enterprise budgets. These budgets are used heavily in enterprise selection decisions as well as serve as the basis for partial budgeting analysis. Also, personnel are heavily involved in verification programs which combine production and cultural management strategies with sound financial management. In the area of farm policy, periodic agricultural policy update newsletters are developed and delivered to field agents and producers to keep them aware of new developments in government program regulations as well as new programs. This was particularly crucial in the aftermath of Hurricanes Katrina and Rita in which personnel within the department not only developed damage estimates, which helped lead to disaster funds becoming available but also led the way in keeping producers and field agents informed on the types of programs available, the rules and regulations of these programs, and the type of assistance being offered.

Each year, it is estimated that more than 3,000 producers and agribusiness firms throughout the state receive and utilize market information through newsletters and fact sheets. Surveys of producers and field agents alike have indicated that this information has been extremely influential in producers making marketing decisions. In addition to traditional commodity marketing programs, personnel also examined value-added opportunities for agricultural producers. One study examined feasibility of developing ethanol from sugarcane while another study examined the feasibility of a soybean extrusion facility in the state. Both projects have been used extensively by producer groups in their planning process for these types of facilities. Also, each year, the enterprise budgets are one of the most highly used and coveted publications developed by the LSU AgCenter. These budgets are used extensively by the Farm Service Agency in the state in their farm loan program as well as private agricultural lenders. In addition, these budgets are highly used by extension personnel in assisting producers analyze potential business decisions from diversifying their cropping enterprise to comparing leasing versus purchasing equipment to determining custom service charges. The verification program also provide a great opportunity for agricultural producers to learn, first hand, how to more effectively manage their operation. For example, in 2006 the Soybean Research Verification program had average soybean yields of nearly 20 bushels per acre higher than the state average. That 20 bushels represented an increase in revenue per acre of more than $120 per acre above the average or typical soybean operation. In

reaction to the hurricanes of 2005, personnel quickly estimated damages of more than $1.6 billion to Louisiana's agricultural, forestry, and fishery sectors. This information was used heavily by Louisiana Farm Bureau, Louisiana Department of Agriculture, and Louisiana representatives in seeking assistance for producers. The result was several $100 million dollars in assistance for Louisiana agricultural producers. In addition, personnel conducted several meetings and issued more than 10 newsletters/fact sheets regarding disaster recovery assistance.

Finally, during the reporting period, extension personnel surveyed a sample of producers from around the state to get their views of the effectiveness of extension efforts. The results from that survey indicated that on more than 80 percent of the respondents indicated that they increased their knowledge base and were assisted in making critical management and marketing decisions due to extension efforts in marketing, farm and financial management and program policy.

Source of Funds

State and Federal Funds (Smith-Lever 3b+c)

Digital Diagnostic Program

Clayton Hollier Plant Pathology

Key Theme: Plant Disease Diagnostics

Disease, weed and insect diagnosis has been an important educational and service function of the Louisiana Cooperative Extension service for years. Approximately 1500 samples are diagnosed annually. Traditionally, samples are received by mail and "drop-in" service. The turnaround time by mail is slow and many times unacceptable for serious commercial pest problems.

Agricultural agents, through personal communication and feedback from training sessions, have had several streamlining and clarification suggestions that have been implemented by incorporation or changing within the digital distance diagnostic network. These suggestions have come from use of the network and network programmers have responded to those suggestions. Agricultural agents and large commercial agricultural production operations now have a faster way to send pest samples and to receive the identification or diagnosis.

A digital distance diagnostic network was developed with the University of Georgia. Named the Louisiana Distance Diagnostic Network (LDDN), approximately 2000 digital image samples were received and diagnosed during its first years. The savings to Louisiana clients are being calculated, but preliminary estimates are approximately $1,000,000. More savings are expected during upcoming years of operation.

Source of Funds

Smith-Lever and state funding for technology enhancement.

Asian Soybean Rust: Identification and Disease Management

C. Hollier, B. Padgett, P. Colyer, R. Schneider, D. Lanclos; Plant Pathology

Key Theme: Plant Disease Diagnostics

Asian soybean rust (ASR) was discover in Louisiana of November 6, 2004 and positively identified by USDA-APHIS on November 10, 2004. This find was the first positive identification of ASR in North America. Yield losses due to ASR in other regions of the world range from 10 to 90 percent. The US discovery concerned the entire country's soybean production infrastructure because of those losses.

An Asian soybean rust team was formed to respond to questions by the soybean industry in Louisiana and the region. Intensive training sessions, grower meetings, workshops, field days, a web site and publications have all been developed to educate the industry of all that is known about ASR. ASR sentinel plots were grown in 25 locations around the state to detect

early development of the disease.

The ASR team educated thousands of people from many walks of life about ASR. It is felt that what is known about the disease has been shared with all who have had interest in the disease, how it works and its potential impact. One industry representative stated that the Louisiana soybean industry is probably one of the best informed in the country because of the efforts of the ASR team. The efforts have saved the soybean production industry millions of dollars due to the fact that the team's monitoring of ASR development in the country allowed us to inform the growers of the presence or absence of the disease and when it occurred, the team was able to guide growers in effective fungicide

Source of Funds

Smith-Lever and CSREES sentinel plot funding.

Intergenerational Succession Plans for Family Forest Lands and Resources

Steve L. Hotard **Renewable Natural Resources**

Key Theme: Land Use

The United States is about to witness the largest intergenerational transfer of family forest ownership in the nation's history. The next generation of forest landowners is increasingly removed from the forestland itself and lack poor involvement with the management of the family lands and resources. It will be important to develop a clearer understanding of the changing needs and interests of the next generation of owners. Incorporating intergenerational succession plans for family forests are key to ensuring the continued sustainability and stewardship of the lands and resources. Ten percent of the lands will be transferred within the next 5 years and almost all will change hands in the next 10-15 years. More than 60 percent of today's forest owners are older than 55 and more than half of these are older than 65. Nationwide, almost 2 million acres of forestlands are being converted to other uses. Many of these acres are from family owned forestlands.

Two Forest Landowner educational programs were developed, discussing forestry Issues and emphasizing the importance of families working and planning together for forestland successional transfers. Over 200 current and future landowners from four states (Louisiana, Texas, Mississippi and Arkansas) participated in these programs and represented over 50,000 acres of family forests. Program topics included intergenerational communications, planning and implementing family meetings, forest resource values, developing and attaining ownership goals, ownership transfer tax issues, shared ownership structures, professional assistance available for landowners, potential for family forest resources, future forest issues (Certification, industry's direction), development of forest resource opportunities, development and uses of management plans, and financial assistance available for current and future landowners. Handouts, educational materials and lists of professional who would be of assistance in certain topic areas were distributed. The educational programs placed great importance in making the participants understand the importance of forest resources, the need for and how to accomplish sustainable management and the importance of the entire family being involved in the development of ownership objectives and goals and active in the implementation of practices needed to achieve the family goals and objectives.

Impact of two educational programs were significant regarding increasing the knowledge of and stimulating participants to act in the future on the following topics; intergenerational issues, forest resource values and potential opportunities and management of forest resources for sustainability. Below are results of the programs:

Participants included current forest landowners, spouses, family members, individuals interested in purchasing forestlands and forestry professionals.

- 47% of participants had never been to a forest resource educational program.
- 100% indicated they would adopt or put into place knowledge gained from program.
- 89% felt the programs would help them save money or earn more income from the information received.
- 96% of participants, post programs, felt more able to make a more informed decision regarding intergenerational

Source of Funds

Construction Safety Products, Inc.
Northeast Louisiana AgBusiness Council
First South Farm Credit

Continued Use of Recommended Practices in Louisiana Production Agriculture

David Lanclos, Rob Ferguson; Agronomy

Key Theme: Agricultural Competitiveness

In Louisiana, soybean, corn and grain sorghum acreage accounts for over one-half or more of the state's acreage annually. Economically, these crops have an impact of over $350 million dollars a year annually. Several primary factors play key roles in the successful production of crops. Yield influencing factors that can impact yield include using recommended cultural practices including recommended varieties or hybrids in addition to following suggested cultural and agronomic guidelines. It has always been a challenge to convey that research data generated by experiment stations actually can be used successfully in full-scale agronomic production. As a consequence, some producers are not as profitable as they could be. This fact, in addition to general economic conditions being tougher than they have been in the past several years forces the extension specialist to continue to improve educational outreach for the financial well-being of clientele. The challenge is conveying research data in a clear, understandable and useable manner to large agronomic operations. Thus, the need to ;demonstrate"; or ";verify"; research-based recommendations on large scale acreage is necessary.

For the past several years, clientele across the state have continued to express more interest in recommended hybrids or varieties planted over a wider geographic area. To accommodate this request in 2006, there were 32 corn demonstrations conducted over 160 acres, 5 grain sorghum demonstrations conducted over 18 acres and 45 soybean demonstrations conducted over 100 acres. In 2007, more than 80 demonstrations are planned in 23 parishes making the Louisiana Crop Demonstration programs one of the largest in the US. The 2006 soybean verification program consisted of 6 parishes and in 2007 there will again be 9 locations. In 2006, a yield record of 51 bushels/A was achieved in the program. These verification fields are visited weekly by a specialist, county agent or extension associate. Recommendations are generally made on tillage practices, fertilization, weed control, and insect and disease control. All production expenses are recorded from planting to harvesting with economic analysis being conducted also.

The crop demonstration program and the soybean verification program are intended to demonstrate the most cost-efficient production practices, thus increasing the confidence of county agents and other clientele in their recommendations. Through these efforts and other outreach methods promoting these program's effects, more than 3,500 producers and agbusiness clientele were able to increase their knowledge of recommended practices and varieties by attending field days or grower meetings. These programs give clientele additional data to make informed decisions on variety/hybrid selections. In addition to recommended hybrids/varieties, producers get to evaluate what these recommended varieties/hybrids look like growing in the field under non-research growing conditions. These demonstrations also stress the importance of using the correct fungicide, insecticide or herbicide treatments and show producers what can happen to certain varieties/hybrids without the correct pesticide treatments.

As a way to facilitate teaching for county agents and specialists, these programs have increased confidence in recommendations but allowed extension personnel to collaborate with researchers on new or desirable research projects. These programs have confirmed that research-based recommendations are valid, adjusted outdated recommendations and educated all involved about feed grain and soybean production in Louisiana.

Source of Funds

Louisiana Soybean and Grain Research and Promotion Board and The United Soybean Board

Cotton Disease Management in Northeast Louisiana

Boyd Padgett **Plant Pathology**

Key Theme: Agricultural Competitiveness

Cotton is a major row crop grown in Northeast Louisiana and ranks third among field crops in the state; therefore, it is critical to maintain and maximize its profitability. State acreage has decreased since 1995 due in part to escalating production costs and depressed commodity prices. Cotton diseases are an annual problem that directly impact production. From 2000 to 2005, diseases reduced Louisiana cotton yield and quality by 13 to 15%. Seedling diseases, nematodes, and boll rots are the predominant diseases affecting cotton in Louisiana. The occurrence and severity of some of these diseases are sporadic and hard to predict; therefore, control measures may be implemented unnecessarily. To effectively manage these diseases, producers may have to spend more than $30.00/A. Therefore, LSU AgCenter researchers and specialist are generating information to enable producers to optimize profits by improving disease management.

Research is conducted by LSU AgCenter extension agents, extension specialists, and research scientists on experiment stations (Macon Ridge and Northeast), as well as in producer fields located in central and northeast Louisiana to evaluate new fungicides and disease management strategies, as well as, to study how specific environmental parameters and production practices impact disease development. This research was initiated in 1999. Research is directed toward evaluating the efficacy of fungicides/nematicides applied directly to the seed or in the seed furrow at planting for managing seedling diseases and nematodes. Other objectives of this project are to evaluate foliar fungicide applications for managing hardlock, and to quantify the influence of the environment (soil moisture and temperatures), cover crops, and reduced tillage systems on seedling disease and pathogen populations.

Results generated from these tests are utilized to: 1) develop fungicide use recommendations, 2) develop fungicide use strategies and define effective rates, 3) determine products and practices are effective for managing seedling disease and 4) educate individuals about cotton disease management (field days, tours, etc).

This research has enabled individuals involved in the cotton industry to make more informed decisions concerning disease management in cotton. LSU AgCenter researchers have identified that the risk to seedling disease is higher in fields where reduced-tillage practices are implemented than in conventionally-tilled fields, because soil temperatures at planting in these fields are usual cooler than temperatures in conventionally-tilled fields. Effective seed treatments for managing seedling disease and nematodes have been identified and their benefits and limitations have been defined. When feasible, using seed treatments instead of in-furrow products to managing seedling diseases and nematodes reduces the pesticide load on the environment and can result in a cost savings of over $15.00 per acre. Since seed treatments are usually applied prior to packaging, pesticide exposure to the producer is reduced compared to on-farm treatments. This is especially important since in-furrow nematicides are highly toxic to mammals. Other research documented the impact of stinkbugs and fungi on hardlock development. It has been demonstrated that stinkbug injury can increase the incidence of hardlock and fungicides have a limited impact on reducing hardlock development.

Source of Funds

Partial funding is provided by the LSU AgCenter in the form of travel monies and salary. Additional funding is provided by the agrichemical industry.

Crop Consultants Wildlife Training

Don P. Reed **Renewable Natural Resources**

Key Theme: Wildlife Management

Louisiana Crop Consultants have a long history of providing information to farmers on managing row crops in our state. In recent years, landowners were asking more and more questions to this group pertaining to wildlife management on their lands. The head of a major Crop Consultants organization approached the AgCenter for help in training their members to deal with this emerging resource management issue.

A day-long training session dealing with various wildlife and habitat management issues was conducted at the Bob R. Jones Idlewild Research Station.

The program provided not only information to these crop consultants but was also available state-wide to county agents as a wildlife training session. Thirty-five individuals attended the program and everyone gained a great deal of

Source of Funds

LSU AgCenter

Management Techniques for Providing the Habitat Needs of White-tailed Deer

Don P. Reed, Brian R. Chandler; Renewable Natural Resources

Key Theme: Wildlife Management

The Quality Deer Management Association was seeking a way to provide educational information to their menbers on various topics pertaining to the management of white-tailed deer in Louisiana. The request was made to better manage the deer herds in our state which are over 75% contained on private non-industrial lands.

The LSU AgCenter in conjunction with the South Louisiana Branch of the Quality Deer Management Association conducted a field-oriented wildlife program at the Bob R. Jones Idlewild Research Station.

The program was attended by 80 individuals and based on random participant interviews, everyone gained a great deal of information from the presentations. Numerous individuals indicated that based on information received from the workshop, they would change their management techniques from their current ways.

Source of Funds

LSU AgCenter
Quality Deer Management Association

Utilization of Distance Education Technology as a Means of Beef Cattle Producer and County Agent Training

Jason Rowntree, Christine Navarre; Animal & Veterinary Sciences

Key Theme: Innovative Farming Techniques

Two primary challenges county agents face are keeping current in their respective area of expertise and providing quality programming to clientele. As do many universities, the LSU AgCenter has several distance education sites across Louisiana. Because many states have this technology, its broad scale utilization lends itself to several capabilities. One benefit of distance ed technology is that nationally acclaimed speakers can be identified to give presentations and have the flexibility to remain local in presenting their specific talk. Secondly, the system allows for multi-university collaboration in program development. Finally, producers and agents alike can remain local and enjoy high quality programming.

Initial planning for collaborative programs between Mississippi State and the LSU AgCenter was initiated in 2004. Since initial meetings, Auburn University and the University of Florida have joined the collaborative effort. Programs involving nutrition, animal breeding and genetics, cattle reproduction, source verification and animal health have been offered.

Speakers involved in the program series have come from eight different states and have come from university and industry. In spring of 2006, the LSU AgCenter hosted the source verification program. This program was hosted from Crowley, LA, and had seven invited speakers including the USDA director for process verification. A total of 56 distance education sites from 4 states were involved. Because of the success of the distance ed programming, the lecture series has also been utilized

as continuing education for the LA Master Cattle Producer program. The Animal Health program was offered in fall of 2006 under the title of Continuing Education for Master Cattle Producer. Eight Louisiana sites were included with over fifty producers and county agents involved.

In 2006, two distance education programs were broadcast. The Source Verification Program was hosted by the LSU AgCenter and included seven nationally know speakers who discussed process and source verification with beef producers. The program was aired to over 30 sites in three states. Producer surveys (n = 22) were accumulated after the program. On a scale of 1 (poor) and 5 (excellent), producers rated the short course overall 4.43 + 0.14. When asked to rate the distance education experience, 4.29 + 0.14. Further when asked if they would attend another program via distance education, producers answered yes 95% of the time. The second program featured speakers discussing animal health was broadcast to 8 sites in Louisiana and also to sites in MS and AL. A similar survey was administered to producers. When asked to rate the program on a scale of 1 (poor) to 5(excellent), the mean respondent answer was 4.00 + 0.10. When asked to rate the distance education experience, the mean response was 3.52 + 0.18. However, again 95% of the respondents answered they would attend another distance education program. This data suggests that distance education programming was effective and for the most part well received. More programs are being planned for 2007.

Source of Funds: Funding for the short courses were derived from the LSU AgCenter and private sources.

Wood Pallet Phytosanitation Program

Todd F. Shupe **Renewable Natural Resources**

Key Theme: Forest Resource Management

Wood pallets are widely used in international trade. There has recently been an increase in global concern regarding the possible moving of insects from country to country via pallets.

A comprehensive web site was developed by the LSU AgCenter to educate producers and users of these new requirements. The web site helps ensure the competiveness of the wood pallet industry and all companies involved in international trade. Over 10,000 pallet manufacturers have visited the site and many have expressed very positive comments.

Source of Funds: USDA APHIS, West Virginia University

Cotton Extension Education Programs

Alexander M. Stewart **Agronomy**

Key Theme: Agricultural Competitiveness

Cotton is one of the leading agricultural commodities in Louisiana and vital part of the rural economy in many parishes. In order to remain viable enterprises, cotton producers must be able to produce cotton in an economical and environmentally sustainable manner while operating in an environment of increasing costs, complex technology, and thin margins. Resistance in cotton pests to key pesticides is an emerging problem facing cotton production and causes economic loss.

Research based information concerning all phases of cotton production has been generated by the LSU AgCenter. In particular, biotechnology has resulted in an exponential increase in available cotton varieties, pest control measures, and production practices. Transferring the research based information through innovative extension educational programs in person and through electronic media is the focal point of cotton extension.

According to a survey conducted within the last two years, over 80% of Louisiana cotton farmers responded that they viewed the LSU AgCenter as the most important source of production information. Since that time, even more effort has been made to broaden the scope of cotton extension programs to further increase that number. Louisiana producers currently plant greater than 86% of their acreage to cotton varieties recommended by the LSU AgCenter.

Several neighboring states to Louisiana have recently reported insecticide resistance in key insect pests, and herbicide

resistance in selected weed species, resulting in significant economic losses. Currently, there are no documented cases of resistance in Louisiana due in part to sound recommendations made by the LSU AgCenter and followed by a high percentage of producers.

Extension continues to be regarded as the primary source of information for Louisiana cotton producers, consultants, and industry members.

Source of Funds

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

Weed Management Programs in Louisiana Iris

Ron Strahan, Bobby Fletcher **Horticulture & Weed Science**

Key Theme: Integrated Pest Management

The use of herbicides for weed control is potentially the most labor saving and economical method of weed management. However, weed management with herbicides is difficult in Louisiana iris because of the lack of registered products and the potential for plant injury. There are several preemergence herbicides that can be used for field production in horticultural crops. Unfortunately, their injury potential on Louisiana iris is not known.

Weed research was conducted for two years on the states largest Louisiana iris farm to evaluate seven different preemergence herbicide programs for winter weed management and injury to several Louisiana iris varieties.

Research conducted at the farm was featured by the Society for Louisiana Iris Growers and was part of the tour for their national meeting held in Lafayette, LA in 2006. Approximately 50 iris growers from around the nation learned about the weed management research conducted by LSU AgCenter scientists by touring the plots treated with the different herbicide programs. Additionally, our farmer cooperators for the research were able to observe our plot work and pick the best herbicide treatments to use in their own production areas and use their successful results as part of the tour.

Source of Funds

Agrichemical Companies

Pasture Weed Control Demonstrations in Louisiana

Ed Twidwell **Agronomy & Weed Science**

Key Theme: Rangeland/Pasture Management

Louisiana has over 1.5 million acres of land that is used for pasture and hay production. It has been estimated that less than 10% of this land is regularly treated with herbicides for weed control. Weeds play a major role in limiting forage production in Louisiana, as weeds decrease the production and quality of most forage stands. Stakeholders need to be educated on the economic benefits of using herbicides to control weeds in their forage stands.

Four demonstrations were conducted on the farms of stakeholders to evaluate 10 different herbicides for control of broadleaf weeds in pastures. Major weed species targeted were horsenettle, Chinese tallow tree, smartweed and goatweed. Four of the herbicides used contain 2,4-D, which is restricted in some areas of the state where cotton is grown. The herbicides were applied during June and July and weed control was visually evaluated about one month after treatment. Field tours of the demonstration plots were conducted at two of the locations.

About 350 stakeholders attended the tours of the herbicide demonstration plots. The participants learned about the

characteristics of the different herbicides, weed identification and how to reduce herbicide spray drift. The effectiveness of the herbicides on the targeted weed species were illustrated through the use of the demonstration plots. The costs of the herbicides were also discussed, so the stakeholders could use this information to help them make decisions on which herbicide products to use in their livestock and forage operations. The importance of sprayer calibration was emphasized to the attendees of the field tours. Data from the demonstration plots were collected and presented at several parish, area and statewide meetings.

Source of Funds

State and Agrichemical Companies

Scope of Impact

Multi-function (integrated research-extension) efforts are estimated at 30% of the total number of FTE's 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 % of program) x 6.82 (FTE's devoted to pasture, forage, and small grain program) x $80,136 ($ equivalent of 1 Extension professional FTE)] = $163,958

Goal 1 – Research Project Reports

Remediation of Rice Fields Impacted by Hurricane Rita`s Storm Surge

Gary A. Breitenbeck, Johnny Saichuk, Howard Cormier; Agronomy & Environmental Management

Key Theme: Plant Production Efficiency

Flooding of low-lying rice fields in Southwestern Louisiana during Hurricane Rita in 2005 has resulted in persistent accumulations of high levels of soil salts more than one year after the event. In some fields, salts remain elevated to such an extent that they are not suitable for rice production in the 2007 season.

Greenhouse studies were conducted to determine the response of popular rice cultivars to various levels of soil salts. Laboratory were conducted to determine the behavor of salt in representative soils. A field study was conducted to evaluate a practical salt for removing soil salts in a field with high salt levels.

Greenhouse studies showed that the response of rice to soil varied greatly among soils types. Similarly, the ability of salts to diffuse into flood water prior to discharge depended varied greatly. Salts in Crowley silt loam, a principal soil type for rice in SW Louisiana, retained salts more than the other soils tested. In general, salts tend to move upward during periods of drying and move rapidly downward in the soil profile with rainfall. The soil then seals and little salt will diffuse upward when a flood is established. To remediate fields where salts are retained, a protocol was established based on lab findings and tested in Vermillion parish. The field was flooded after a rain, the field was then water-leveled and the flood water discharged after five days. This procedure removed between 500 and 1000 lbs salt/acre. After one flushing, salts in the field were sufficiently reduced to suggest a rice crop would be successful.

Source of Funds

Rice Research Board

Identifying the cause of localized decline in south Louisiana rice production

Gary A. Breitenbeck, Johnny Saichuk, Joseph Kraska, Howard Cormier, Ronnie Levy; Agronomy & Environmental Management

Key Theme: Plant Production Efficiency

For more than a decade a mysterious disorder has affected a limited number of rice fields in SW Louisiana. Symptoms generally occur in young plants around tillering. Plants are stunted and stands are poor. Unless the flood is removed promptly, the disorder can rapidly spread. Even when the spread is arrested, the crop usually fails to recover. For those who experience the disorder, the finacial impact can be severe.

An intensive investigation was conducted involving the collection of plants and soils from fields displaying symptoms. Management practices were also analyzed. Plant and soil samples were extensively analyzed to determine unusual factors that could account for the disorder.

It appears that this mystery disorder is the result of excessive uptake of iron and aluminum, possibly augmented by zinc deficiency. Once excessive levels of iron and aluminum are taken up by the young rice plants, little can be done to prevent their decline. However, the soil types where this disorder occurs are not those typically associated with iron toxicity. Further investigation showed that silicon levels were also very low. Because inadequate silicon is associated with a number of abiotic and biotic stresses in rice, silica was applied with 10 other treatments to fall rice grown for crawfish in an area where the disorder predictably occurs. Of the eleven treatments, only slag (3 tons/acre) significantly reversed the symptoms of the disorder.

Source of Funds

Louisiana Rice Research Board

GIS and GPS Procedures to help improve cotton management

Eugene Burris, Charles Overstreet, Boyd Padgett, Maurice Wolcott, Ernest Clawson; Agronomy

Key Theme: GIS/GPS and Precision Application

In Northeast La the major pests of cotton have changed due to the introduction of genetically modified cotton plants that control many of the caterpillar pests. Also implementation of the boll weevil eradication program has helped change the spectra of insects' farmers now encounter. New experimental compounds for controlling pests are available but must be evaluated for effect and mode of action differences. The farmer does not have the capability to conduct the complex studies required to evaluate pest control strategies but requires the information to be disseminated through educational programs. Programs to manage plant parasitic nematodes are expensive. Soil conditions that support infestations are highly variable. Research to evaluate increased sample efficiency by soil zone is greatly enhanced by the use of GIS and GPS techniques and has lead to increased efforts to evaluate interactions with nitrogen management and/or other agronomic practices. These programs may lead to enhanced use of site-specific management and overall improvements in pest and/or agronomic technique.

Experimental compounds and the product combinations were evaluated for the control of tarnished plant bugs in small plots and in one on-farm test. The newer products such as Diamond, Carbine, and metaflumazone affect insects more slowly than those in other classes such as organophosphates or neonicotinoids. To accurately measure insecticide efficacy, these new compounds required sampling methods such as measurement of plant injury as opposed to direct measurements of insect numbers. Studies to evaluate the effects of native winter-spring host plant management on TPB infestations in cotton were conducted. Apparent soil electrical conductivity (ECa) measurements for texture mapping, elevation data for developing topographic maps and applications of variable-rate treatments with a John Blue variable rate applicator were used to develop data in these tests. ECa data was collected using a Veris® model 3100 sensor cart, Veris Technologies, Salina, Kansas. Soil samples for nutrient and nematode measurements were sampled using Oakfield soil sampling probes (19 x ¾ inches). Through the cooperative efforts of the USDA-ARS and NRCS, the Goldman equipment group and a Precision Ag planning group, we established three tests on three farms in three parishes to evaluate variable rate nitrogen. and two on-farm studies to continue evaluating opportunities for site-specific nematicide applications.

In an on-farm demonstration, both Carbine and the combination of Bidrin plus Diamond performed well against TPB nymphs. The newer products such as Diamond, Carbine, and metaflumazone affect insects more slowly than those in other classes such as organophosphates or neonicotinoids. Densities of TPB nymphs were higher in cotton fields in

Source of Funds

Selected Industry groups
Region 6 EPA
Cotton Incorporated
USDA-ARS

Testing Biopesticides for the Ornamental Industry

Yan Chen Ornamental Horticulture

Key Theme: Ornamental/Green Agriculture

Production of ornamental crops depends heavily on pesticides. However, growers often have limited number of pesticides to choose from because fewer products are registered on ornamentals. The overuse of these products has resulted in problems such as pesticide resistance. One IPM option is biopesticides, either used as early stage curative or as rotation/tank mix partner in a resistance management program. Many biopesticide manufacturers are small companies that do not have the

resources to obtain extensive efficacy data required by EPA. We participated in the IR-4 project with the goal to address this problem by conducting efficacy trials to help bring new biopesticides to growers.

In 2006, four trials were conducted at the Hammond Research Station to test various biopesticides for western flower thrips control and biofungicides for daylily rust control. We focused on these pest problems because of the need expressed by growers. Trial results were reported to IR-4 and at grower meetings and workshops.

Due in part to the trial results we provided to manufacturers, several biopesticides are being evaluated by EPA. Growers are more aware of the new biopesticides and have exposure on how to use them.

Source of Funds

IR4 Ornamental Program

PGR Studies to Help Growers Improve Crop Quality

Yan Chen **Ornamental Horticulture**

Key Theme: Plant Production Efficiency

Ornamental growers have never been so affected by the shelf life and quality of their produces before the ‘;Pay-by-scan’ policy becomes a phenomena on the retail floral market. ‘;Pay-by-scan’ has transferred most of the risk during retail such as diminished shelf quality back to growers. A treatment with PGRs such as BA, GA, or their combination may provide additional protection against shipping stresses such as dark, low temperature, and ethylene exposure or negative retail environments such as low light and drought stress. However, effective concentrations and application conditions are unknown.

Two trials were conducted with ivy geranium as the crop receiving various PGR treatments. BA products at a rate of 20 - 50 ppm resulted in better shelf life and flowering performance in two varieties. One more trial with zonal geranium will be conducted in spring 2007 to conclude the geranium PGR shelf life study. Trail reports were presented during grower meetings and county agent workshops.

Because the study is still at preliminary stage, we have limited information to offer to our growers on how to extend shelf life of potted floral crops. However, based on this study, more crops will be tested to generate conclusive recommendations.

Source of Funds

IR4 Ornamental Program

Initiating Phenology Studies to Aid IPM Adoption in Landscape and Production

Yan Chen **Ornamental Horticulture**

Key Theme: Integrated Pest Management

Phenology is the study of recurring biological events. Because plant phenology is closely related to climate and the insect pest activities, it can be used to develop a ‘;Biological Calendar’ to target timing of pesticide application during nursery production or around home and gardens. Research in northern states has developed such a calendar for their nursery and landscape industry. However, little is known about the phenology of plant species commonly seen in southern landscapes and their correlation with unique pests in this region.

The Hammond Research Station has been preparing proposals to get federal funding for the initiation of a phenology research network. We have received a seed grant in 2006 to establish a phenology research garden at the station. With the planting of this garden, we will further seek support for the state-wide phenology IPM network.

Timing pesticide application is an important step to transfer from traditional calendar pesticide spray program to IPM. With the increasing awareness of the better stewards of the environment, our nursery growers and landscape managers are willing to adopt IPM but only when information and techniques are available to support their transfer. With the Biological Calendar available for our cliental throughout Louisiana, more growers will adopt target spray and pesticide use will be significantly reduced.

Source of Funds

LA EPSCoR Pilot Fund

Nutrient Management Matters in Landscape Maintenance

Yan Chen **Ornamental Horticulture**

Key Theme: Home Lawn and Gardening

Nutrient management is an essential element of an economically sound and environmentally friendly landscape maintenance program. Appropriate fertilization practices result in healthy plants with less pest problems (less pesticide applications). On the other hand, over-application of fertilizer increases maintenance cost and negatively impact water system with non-point pollution of N and P from public and home gardens. Current fertilization recommendations are often too general or missing for new groups of plants.

Two nutrient studies were conducted on 1) fertilizer requirement of herbaceous perennials in landscapes and 2) how fertilization practices at planting will affect disease in annual vinca. Guidelines on fertilization were developed for herbaceous perennials as they were grouped as low, medium and high for nutrient needs. Effects of various cultural factors on disease were discussed during landscape professionals' meetings.

We fine-toned fertilization recommendations for various new perennials used in our region and updated information on planting techniques that will reduce disease incidence on vinca plants. With these studies as models, we expect to study more plants commonly used in our area and generate useful information on nutrient management for landscape managers.

Source of Funds

Select Native Plants for Storm Water Bioremediation

Yan Chen **Ornamental Horticulture**

Key Theme: Plant Production Efficiency

Population growth in St. Tammany and Tangipahoa Parishes (around 32% and 17%, respectively) has increased the potential for urban pollution of the Lake Pontchartrain Basin. The Tangipahoa Watershed, as reported by USGS, is seriously impaired and does not fully support any of its designated uses. There is a critical need for information on effective, practical and aesthetic means of mitigating urban/suburban landscape pollution, for example, list of plants that are more efficient for retention ponds, constructed wetlands, and rain gardens.

We have completed the design and excavation of retention pond/wetland to collect irrigation/storm water from the gardens and arboretums of the Hammond Research Station. Also, a greenhouse recirculation hydroponic system was built to evaluate various native species of plants for nutrient, chemical, and erosion abatement potential as well as landscape appearance and value.

The plant list we compile will provide useful information during decision making process of city planners, developers, and home owners when it comes to plant selection for functional areas along highway, in subdivisions, or around homes for storm water bioremediation. Also this project has the potential to promote native plant production by the green industry.

Source of Funds

Lake Pontchartrain Foundation

Soybean Planting Date Research in Northeast Louisiana

Ernest L. Clawson, Donald J. Boquet, John A. Hendrix, III; Agronomy

Key Theme: Agricultural Competitiveness

In Louisiana, the production of an early-maturing soybean crop is beneficial for several reasons. Soybeans are subject to increasing disease and insect pressure as the season advances, and late-maturing crops may require greater expenditures for control of these problems. An early-maturing crop may reduce the probability of weather-related harvest delays or losses, and in some years, there are economic incentives for early delivery of soybeans. These factors, along with reports of high yield potential, have created greater interest in early planting of soybeans in Louisiana. This interest includes early April and mid-to-late March planting dates, both of which are substantially earlier than the traditional planting dates for soybeans in Louisiana. Research is needed to compare the performance of early-planted soybeans to that obtained with later dates of planting.

A field experiment examining the responses of soybeans to planting date was conducted in 2006 at the LSU AgCenter Northeast Research Station at Saint Joseph, LA. The soil was Sharkey clay, which is commonly planted to soybeans in the Delta area of Northeast Louisiana. Soybeans were planted on eight dates ranging from March 15 to June 2. Intervals between planting dates averaged 11 days. The range of planting dates represents what is currently considered very early, early, normal, and late planting of soybeans. One Maturity Group (MG) V, four MG IV and three MG III varieties were planted on each date. Because row spacings can affect planting date responses, each variety was planted in both narrow and wide row spacing. The probability of waterlogging was reduced by the use of wide raised seedbeds in each row spacing, and the study was irrigated to prevent drought stress. To prevent yield losses, harvests of mature plots were performed at approximately weekly intervals. The data collected included soil temperatures, growth stages (including the timing of maturity), and yield.

The early results of this study have a number of implications for Louisiana soybean producers. Although early in maturity, MG III varieties did not yield as well as MG IV varieties and probably should not be planted unless early maturity is a major production objective. Producers may experience yield reductions from planting MG III or I.

Source of Funds

State, Hatch, Louisiana Soybean and Feed Grain Research and Promotion Board, unrestricted grants

Plant Growth Regulators and Rice Production and Profitability

Richard T. Dunand Agronomy

Key Theme: Agricultural Profitability

If seedling vigor is not maximized, two major problems arise in rice production. With less than optimal seedling vigor, seedlings grow slowly contributing to a prolonged period of emergence and short seedlings. The consequence of both is a significant delay in establishing the permanent flood. As the time to flood is delayed, irrigation water and pesticide use increase and fertilizer efficiency decreases. Unless there is timely rain, the frequency of flush irrigation (quickly flooding and draining a field) increases to prevent drought stress and keep the soil surface damp and prevent crust formation which inhibits emergence. The flood in rice acts as a form of weed, disease, and insect control and improves nitrogen fertilizer efficiency during seedling and tiller development. As the flood is delayed, an increase in pesticide use and losses of nitrogen from fertilizer occur.

Plant growth regulators, several formulations of gibberellic acid and some proprietary products, were evaluated for their effects on emergence and seedling growth. Products containing gibberellic acid consistently increased seedling vigor. Seed

treatments resulted in 3 to 7 days earlier emergence, depending on the germplasm evaluated and date of planting. Studies planted in March showed less improvement with plant growth regulator seed treatments compared with studies planted in April due to the cooler conditions. Short stature and semi dwarf long-grain types (predominate in the southern rice growing states) were more responsive to seed treatment compared with tall stature and medium-grain types. Foliar applications increased seedling height 2 to 4 inches within 1 week following application. The foliar response to the plant growth regulators was relatively constant across rice types, was affected only slightly by planting date, and was not affected by formulation of post-emergence herbicide.

Plant growth regulators were shown to improve seedling vigor dramatically and, consequently, have the potential to impact water management, pesticide use, and nitrogen fertilizer efficiency in rice. With current prices of fuel, fertilizer, and pesticides, the impact on rice production can be substantial through savings. Minimizing the amount of flushing saves on fuel costs and pump maintenance and limits well and surface water demand. Allowing earlier flooding can contribute to less use of pesticide and fertilizer, providing an additional direct economic impact. The cumulative benefit from savings associated with limiting water, fertilizer, and pesticide use could amount to as much as $75 per acre (or 20% of total production cost) during the growing season. The price of plant growth regulators that would allow these savings would be less than $10 per acre and less than $5 per acre if the foliar applications are made in conjunction with a pesticide application.

Source of Funds

State funding and Louisiana Rice Research Board and Industry grants

Proper N Management Can Increase Profits in Southwest Louisiana Ratoon Rice Crop

Dustin L. Harrell **Agronomy**

Key Theme: Agricultural Profitability

The climate in the Gulf Coast region of Southwest Louisiana is conducive for growing a ratoon rice crop. Ratooning is the practice of regrowing rice from the stubble left after the first or main crop harvest. Considerable increases in grain yields and profits can be achieved with proper nutrient management practices, particularly with nitrogen (N). With the recent increases in N fertilizer prices, over application or improper timing of N fertilizers can quickly eat into profits. Furthermore, since ratooning has only been practiced since the early 1960s and because it can only be accomplished in the Southern Gulf Coast region, limited research in the past has focused on improving ratoon yields.

Several research studies were initiated addressing the proper timing and rate of N fertilizer applications to ratoon rice crops of semidwarf and hybrid cultivars. In 2006, Cocodrie and Trenasse ratoon yields were evaluated for their response to various N application rates (60, 90, 120 and 150 lb N/A, as urea) applied immediately after main crop harvest. The optimum ratoon N rate for both varieties was 90 lb N/A. In a similar study, rice hybrids XP723 and CLXL8 were also evaluated. Again, N rates above 90 lb N/A did not increase ratoon rice yields. Nitrogen application timing for ratoon rice production was evaluated for two rice varieties, Cocodrie and Trenasse. Nitrogen was applied at 90 lb/A at one of six different application timings: main crop heading, 7 days prior to draining, main crop harvest, 60/30 split between heading and harvest, 60/30 split between 7 days prior to draining and harvest, or 60/30 split between harvest and 21 days after harvest. Nitrogen applied at main crop harvest provided the highest grain yields for both varieties.

Proper N fertilizer application rate of 90 lb N/A was found to optimize grain yields in both semidwarf and hybrid cultivars in ratoon rice crop production. With the high cost of N fertilizer, over application of N by 30 lb/A can increase ratoon input costs by an estimated $9.50 per acre without increasing grain yields. Application of N fertilizers at improper timings can further increase profit losses. Maintaining a profitable ratoon crop in Southwest Louisiana is dependent on good cultural and nutrient management practices.

Source of Funds

State funding and Louisiana Rice Research Board grants

Development of Wheat and Oat Varieties for Louisiana

Stephen A. Harrison, H.J. "Rick" Mascagni, G. Boyd Padgett, Kelly Arcenueaux, Glenn Schexnayder; Plant Breeding

Key Theme: Agricultural Competitiveness

Small grains are an important crop in Louisiana that provides cash flow during the early summer and fits into many cropping systems. Wheat is also used as a cover crop for cotton and in winter pasture for cattle. Oats have become the preferred crop for wildlife food plots and are used as winter pasture. Wheat and oat production are highly dependent on research and variety development programs of public institutions. There is one private wheat breeding program left in the entire southern US and no private oat breeding programs. There is a continued demand for wheat varieties and mid-size seed companies are anxious to fill that niche, given the opportunity to exclusively license new varieties. It is important to growers in Louisiana and the southern US that small grain varieties adapted to the region are developed and commercialized.

The LSU AgCenter small grain breeding and genetics program was established in 1985 to provide improved varieties of wheat and oats in support of agricultural enterprises in Louisiana and surrounding states. Development of new varieties is a long-term commitment that requires at least ten years from the initial hybridization to variety release. The breeding program makes new crosses each year and evaluates thousands of experimental lines across the state. The plant breeding program is a collaborative effort involving scientists at research stations around the state and region. A five-university cooperative breeding program (SUNGRAINS) was established to share research and germplasm in order to maximize productivity of wheat breeding programs in the region.

The LSU Agricultural Center small grain breeding program has released eleven wheat and oat varieties since 1998, including three releases during 2006. These varieties are widely grown by farmers in Louisiana and surrounding states. They are high yielding, are adapted to the unique environment of Louisiana, and require fewer chemical inputs for disease and insect control. LA841 wheat, released in 2002, accounted for well over 50% of wheat produced in Louisiana during 2006. This high-yielding and disease resistant variety significantly increased economic viability of Louisiana farms and also the Louisiana-based company that markets the variety across the region. The newly released wheat varieties, LA482 and AGS 2060, were increased and will be available to growers next summer. Three oat varieties developed by this program are marketed for wildlife food plots across the region. These varieties provide significant economic return to two Louisiana seed companies and increase the recreational value of hunting in Louisiana. Plant breeding programs require a large commitment of time and resources but provide a very high rate of return to the citizens of Louisiana.

Source of Funds

State, Hatch, Louisiana Soybean and Grain Research and Promotion Board, Royalties, USDA Grants.

Agricultural Trade Policy Research

Lynn P. Kennedy Ag Economics and Agribusiness

Key Theme: Agricultural Financial Management

The United States government has recently concluded a number of trade agreements and continues to pursue trade agreements with various countries. Several of these agreements and potential agreements involve increased U.S. sugar imports. Given the potential for increased inflow of sugar into the United States, it is important to understand and determine the impact of these increased sugar imports on U.S. producers and consumers.

LSU AgCenter researchers have developed a partial equilibrium trade simulation model to determine the impact of an expansion of the U.S. sugar import quota. The model utilizes elasticities from previous studies and combines them with price and quantity data for 2003. Various scenarios are analyzed based on alternative levels of sugar imports.

The results of the analysis show that increased sugar imports into the United States will have a significant impact on domestic sugar prices. Expansion of the sugar import quota will gradually lower the U.S. price to the loan-rate level. Once this occurs, U.S. sugar policy will no longer operate at "no-net-cost" to the U.S. government. The results of this

research indicate that U.S. policy makers must coordinate trade and domestic policies if our sugar program is to be sustainable. As more trade agreements are concluded, and as market access for foreign sugar continues to increase, policy-makers must identify alternative domestic policy options that can be effectively used within this new trade environment.

Source of Funds

State, Hatch and Multistate

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

Jerome La Peyre **Veterinary Science**

Key Theme: Aquatic Animal Management

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. In Louisiana, the yearly mortality rate due to P. marinus has been estimated at greater than 50% for market-sized oysters. 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.

The effects of the serine protease inhibitor cvSI-1 purified from oyster plasma on P. marinus viability and proliferation were measured in vitro. CvSI-1 inhibited the proliferation of P. marinus but did not kill the parasite. Expression of cvSI-1 in oyster tissues was characterized by quantitative real-time RT-PCR and in-situ-hybridization. CvSI-1 gene expression was highest in digestive gland tissues and was detected in hemocytes. The major plasma protein (22,092 Da) of the eastern oyster was purified, characterized and designated dominin. In situ hybridization and quantitative real-time RT-PCR revealed that dominin`s gene was mainly expressed in hemocytes located in the mantles and gills.

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

Source of Funds

National Sea Grant, Louisiana Sea Grant, Hatch

Aspects of Crawfish Reproduction and Recruitment with Implications for Affecting Production

Ray W. McClain, Robert P. Romaire; **Aquaculture**

Key Theme: Aquatic Animal Management

Crawfish farming in Louisiana and other areas of the southern United States does not rely on a hatchery component for populating grow-out ponds, unlike many aquaculture enterprises around the world. Rather, dependence is upon indigenous and/or supplemented broodstock to reproduce naturally in subsurface burrows as crawfish in the region have evolved to do. Without the reliance on natural reproduction, crawfish farming would probably be non-profitable. Yet, the dependence on natural reproduction as the sole means for recruitment, with little knowledge or control of the factors influencing outcomes, results in highly variable and unpredictable crops from year to year and from pond to pond and puts producers at a financial disadvantage. Low yields have a negative impact on cash flow and profits, and unpredictability clearly hinders management operations and marketing plans.

Research within the LSU AgCenter on the reproductive biology of crawfish, a very difficult and much neglected study topic, has intensified in the last few years. Because of the inherent difficulty of investigating this complex biological function that naturally occurs in subsurface burrows and due to an overwhelming number of biological, environmental, and cultural factors that can influence reproductive success, little basic research exists in this area. Therefore, a system of artificial burrows that

closely simulate conditions inside the natural burrow has been developed and employed in a number of recent research trials. This system appears to provide an acceptable means of reproducing crawfish in the lab and, in concern with field work, evaluating the effects on reproductive success from a variety of factors such as broodstock source, time of year, body condition, simulated drought, and various other biological and cultural factors. Investigations have also focused on natural burrows by assessing burrowing and burrow characteristics and burrow occupants under various conditions. Moreover, other aspects of natural reproduction and recruitment with implications for affecting production have also been investigated, such as cold shock susceptibility of hatchlings and effects of various recruitment patterns.

Significant results have emerged from this research, and efforts are continuing. One study concluded that few offspring from winter-burrowing crawfish (Jan - Mar burrows) were likely to reach acceptable harvest size within that current production season. The implication of this is that efforts to avoid capture of mature female crawfish at midseason or to return them to the pond, especially at periods of peak prices, may not be worth it since their offspring are unlikely to significantly contribute to the annual yield and may even exacerbate stunting problems under some conditions. It was found in another study that survival of crawfish burrowed at the water's edge (prior to pond draining) prior to a dry summer was less than half of that when crawfish burrowed near the pond bottom following draining. However, early burrowing crawfish tended to spawned earlier - 61% by October whereas only 29% of the later burrowers had spawned by then. Such effects show the extent to which crawfish recruitment from natural reproduction may be dependent on common variables such as burrow location/timing coupled with an extreme environmental condition.

Further findings showed that of those crawfish collected from traps at the end of the season and placed in artificial burrows, only 50% of the surviving females spawned, whereas 94% of those collected from burrows spawned. This is important because all introduced broodstock are trap-harvested, necessitating some minimal holding period from new pond stocking to draining. One study that did not confirm a cause for recruitment variability was cold shock susceptibility of crawfish hatchlings. Hatchlings acclimated to 72oF and suddenly exposed to, and maintained for several days in, water temperatures in the low to middle 40s showed very low mortality (2 to 7%). While much of these findings must to be considered preliminary at this point, their usefulness lies in the building a foundation of information from which a better understanding can be built. A better understanding of the cause/effect relationships of these types of factors will eventually aid scientists and producers in developing management recommendations to control or enhance natural reproduction in crawfish aquaculture.

Source of Funds

USDA CSREES Special Grants - Aquaculture Program
Louisiana Crawfish Promotion and Research Board

Compilation of Disaster Preparedness and Recovery Information for Beef and Dairy Producers

Christine B. Navarre, Jason Rowntree; Animal & Veterinary Science

Key Theme: Animal Disaster Preparedness

The 2005 hurricane season was devastating to beef and dairy producers of the gulf coast. In dealing with the aftermath of Hurricanes Katrina and Rita, much experience was gained and many lessons were learned. It was also discovered that although there was much information available electronically, it was scattered between and within websites, and could be difficult to find quickly. It was also unavailable to agents and producers in areas without electrical service. Therefore, pertinent information in printed format was needed for quick distribution in case of future disasters involving cattle.

Pertinent information gathered from multiple sources was combined with first hand experiences of LSU AgCenter personnel into a series of fact sheets and publications. This was a cooperative effort between LSU AgCenter extension faculty, and Mississippi State University and Auburn University extension faculty. Nine fact sheets/publications were prepared with the following titles: Disaster readiness for beef producers; Disaster readiness for dairy producers; Feeding cattle following a disaster; Water requirements and safety for cattle following a disaster; Potential livestock disease problems following disasters; Disaster biosecurity in cattle operations; Drought management on Louisiana dairy farms; Mississippi beef cattle producer guide to coping with drought conditions; Tax considerations for livestock producers impacted by 2005 hurricanes. The fact sheets were printed and assembled in ring binders. A portion of the binders were distributed to agents for distribution to producers. Binders were also distributed at the Louisiana Cattlemen's Association Annual Convention and the

Mississippi-Louisiana Dairy Management Conference. The remainder of the binders were placed in safe storage for immediate distribution should the need arise.

The information provided in this compilation of fact sheets will provide beef and dairy producers with the most critical information needed to prepare for and mitigate the effects of disasters involving their livestock. Being better prepared for and able to minimize the effects of a disaster will curtail the economic impact to the producers. It also decreases animal suffering and disease following a disaster, which also limits the impact on human health and food future disasters involving cattle safety. Although the focus of the fact sheets at the time of their writing was on hurricane preparedness and recovery, the information compiled will be useful in any disaster situation.

Source of Funds

The Eli Lilly Foundation, through sponsorship by Elanco Animal Health and the American Association of Bovine Practitioners provided funds for printing the fact sheets and publications and purchasing binders in which to assemble them.

Biochemical and Physiological Mechanisms of Insecticide Resistance

James Ottea **Entomology**

Key Theme: Integrated Pest Management

There are costs associated with the application of synthetic insecticides. Some are fairly obvious and predictable. Other effects, however, such as those occurring at the biochemical level in populations of pest insects, are more subtle. Currently, there are a number of new insecticides, many with novel target sites, which are available for use in Louisiana agriculture. Maintaining the efficacy of these compounds depends on managing their use such that susceptibility in pest populations is prolonged. In all cases, the rate at which insecticide resistance develops to these compounds depends on how intensively they are used. In some cases, however, the appearance of resistance in populations is unexpectedly rapid, and is conferred by mechanisms present in populations as a result of previous exposure to unrelated insecticides. Such a scenario may be unfolding with two relatively new insecticides that are being sprayed in Louisiana crops.

My research examines the mechanism by which resistance to one class of insecticides may be expressed to other, often novel, groups of insecticides. Tebufenozide has been used in Louisiana sugarcane since 1998 and is an important component of strategies to manage the sugarcane borer. Whereas research indicates that susceptibility to tebufenozide remains widespread in sugarcane growing regions of Louisiana, there are indications that, in areas where it is used extensively, resistance is beginning to appear. Similarly, indoxacarb is a new insecticide that was used extensively (and resisted rapidly) in some areas of the US. Ongoing studies have identified the enzymes that metabolize indoxacarb in resistant insects. Similar research with tebufenozide will be underway in the near future.

By elucidating the enzyme(s) responsible for metabolism of indoxacarb and tebufenozide in resistant insects, a strategy for monitoring the development of resistance to these insecticides in Louisiana crops may be designed and implemented. In addition, metabolic profiles measured in resistant insects with these compounds will facilitate development of new insecticides (or insecticide synergists) that have anti- resistance properties. Finally, management of resistance will provide economic benefit in that the “;field life”; of current insecticides will be increased, and the cost of developing and using new insecticides will be avoided.

Source of Funds

E.I. DuPont and EPA

Help with Lawn/Garden/Grounds Maintenance

Richard Parish **Ag Engineering/Horticulture**

Key Theme: Ornamental/Green Agriculture

Homeowners and grounds maintenance professionals use many types of equipment for lawn and garden installation and maintenance. A tremendous variety of equipment is available. Selecting the correct tool or machine and using it correctly, efficiently, and safely can be a challenge for both homeowners and professionals.

A series of over 180 articles on lawn, garden, and grounds maintenance equipment was written. These articles have been loaded onto the AgCenter CMS system. Many of them have been used in AgCenter news releases. The articles cover a wide range of general categories such as lawnmowers, garden tractors, compact tractors, professional turf mowers, fertilizer spreaders, garden tools, pruning tools, irrigation, etc. One group of articles provides web-based sources for various equipment categories. Topics such as selection, maintenance, optimal use, and safety have been addressed. Each article is short and succinct, covering only one narrow topic, and most are.

The articles have been used by newspapers, thus taking the information to homeowners. The articles on the website have resulted in requests for more information from around the country. The articles provide a starting point for information on the subjects, then the reader is encouraged to e-mail the author with questions and requests for additional information. This information provides both homeowners and grounds maintenance professionals with a practical and readily available source of information on a wide range of equipment topics. The articles also provide Extension personnel with a resource for information on the subject.

Source of Funds

LSU AgCenter (LCES and LAES)

Granular Applicator Research Facility

Richard Parish **Ag Engineering/Horticulture**

Key Theme: Precision Application

Homeowners and grounds care professionals use granular applicators to apply fertilizer and pesticides to home lawns and other turf areas including parks, golf courses, athletic fields, and sod farms. Many applicators, both homeowner and professional, do not know how to properly use their spreaders, nor how to select a precise spreader. Manufacturers of granular products want to recommend spreader settings for their products, but often do not have the capability to develop settings themselves.

A spreader test program at the Hammond Research Station addresses these needs. Using an inventory of over 60 homeowner and professional spreaders, settings are developed for manufacturers to put on product labels. Spreaders are tested and evaluated for spreader manufacturers, with feedback provided to improve spreader designs and/or granular product quality. Many research studies have been conducted using different sizes and types of spreaders to provide guidance to applicators on how to best use spreaders and to provide information to manufacturers, researchers, and teachers on how to design, use, and test spreaders.

The granular applicator research facility has attained national and international recognition.

Source of Funds

LAES support plus industry grants: Bayer CropScience, Valent USA, The Scotts Company, The Andersons, Cleary Chemical, Luxmark, Whitmire Micro-Gen, Precision Laboratories, Grace-Sierra, Monsanto, Helena Chemical, Uniroyal Chemical, Spyker Spreaders, Nu-Gro, Novozymes, DuPont, Howard Johnsons.

Economic Feasibility of Ethanol Production from Sugar in the United States

Michael E. Salassi; Ag Economics and Agribusiness; Dr. Hossein Shapouri (USDA)

Key Theme: Agricultural Competitiveness

The reduction in use of methyl tertiary butyl ether (MTBE) due to its environmental problems caused by groundwater contamination and surging prices for petroleum-based fuels are dramatically increasing the demand for ethanol and the interest in ethanol production in the United States. Ethanol can be produced from carbohydrates such as sugar, starch, and cellulose by fermentation using yeast or other organisms. The United States produced 3.9 billion gallons of ethanol in 2005, almost all utilizing corn as the feedstock. The majority of ethanol made around the world uses sugar as the feedstock. The U.S. Congress, USDA and the U.S. sugar industry was interested to know what was the economic feasibility of using sugarcane or sugarbeets as a feedstock in U.S. ethanol production, given current fermentation technology.

A cooperative research study between the Office of the Chief Economist of USDA and the Department of Agricultural Economics and Agribusiness at the LSU Agricultural Center was conducted to evaluate the economic feasibility of ethanol production from sugar feedstocks, including molasses, sugarcane and sugar beets.

Major conclusions from this study relative to the economic feasibility of using sugar crops as a feedstock for ethanol production in the United States were:

(1) It is economically feasible to make ethanol from molasses. The cost of that feedstock is low enough to make it competitive with corn. Challenges may involve having a large enough supply of molasses at a given location to minimize transportation costs to justify construction and operation of an economically efficient ethanol production facility.

(2) The estimated ethanol production costs using sugarcane or sugar beet juice are high relative to the cost of converting corn into ethanol. Over the longer term, the profitability of producing ethanol from sugarcane and sugar beets depends on the prices of these two crops, the costs of conversion, and the price of gasoline. A moderation in the price of gasoline and a return in ethanol prices to their historic relationship with gasoline prices could push the price of ethanol well below breakeven levels for converting sugar beets and sugarcane into ethanol

(3) Cellulosic conversion of biomass into ethanol could reduce the cost of converting sugarcane into ethanol in the future. Challenges would include development of high tonnage varieties of sugarcane as well as economical processing costs of cellulose on a commercial scale.

Results of the study provided the U.S. sugar industry with benchmark cost estimates which could be used to compare alternative ethanol production technologies currently being researched and developed.

Source of Funds

USDA

Development of Improved Long-Grain and Special Purpose Rice Varieties for Louisiana

Xueyan Sha, Steve Linscombe; **Plant Breeding**

Key Theme: Agricultural Competitiveness

Rice ranks fourth in cash value among all agronomic commodities in Louisiana, only behind forestry, cotton, and sugarcane. During last 5 years, long-grain rice made up over 95% of the total Louisiana rice acreage. The development of long-grain varieties with much improved yield potential and milling quality, as well as disease resistance, will certainly help the rice industry not only in Louisiana but also in the southern rice growing region. The demand for special purpose aromatic rice has increased dramatically over the past two decades. Most of the aromatic Jasmine and elongating Basmati rice in the U.S. market is imported, and the volume of such imports is increasing every year. Special purpose rice varieties that can be economically grown in Louisiana and the southern United States will fit that fast growing and high value niche market. Field tests in 2006 included 167 transplanted F1s (81 long-grain and 86 specialty), 55 space planted specialty F2 populations, and 21,940 progeny rows (15,440 long-grain and 6,500 specialty) ranging from F3 to F8. Out of those rows, 844 rows were bulk-harvested for further evaluation (578 long-grain and 266 specialty). A total of 377 new crosses were made in 2006. Two hundred fifty-four breeding lines (174 long-grain and 80 specialty) were included in the preliminary yield test. Of those, 110 (78 long-grain and 32 specialty) in replicated tests (PY) and 144 (96 long-grain and 48 specialty) in the single plot tests (SP).

Seven advanced long-grain, 3 medium-grain, and 3 specialty lines were tested in the uniform regional rice nursery (URN). Most of these lines were also tested in statewide multi-location Commercial-Advanced (CA) yield trials. Grain quality and specialty traits such as dimension, size, translucency, and aroma are extremely important to this project. Previous studies revealed that several such traits were highly inheritable and can be effectively selected in the mid- or even early generations.

Such rigorous selection in the early and mid-generations enables us to efficiently use our limited resources by concentrating on the materials with some of the target traits. Extensive lab work was carried out to evaluate grain quality and/or aroma of 2006 field selections of 1,911 specialty rows ranging from F3 to F7. About 50% of tested specialty progenies have been discarded because of the poor grain quality or lack of strong aroma. An additional 588 bulked long-grain and specialty rows were evaluated for seedling vigor, milling, grain quality, and/or aroma. The medium-grain experimental line LA2028 and two specialty lines (Basmati type LA2177 and Jasmine type LA0402125) continuously showed superior yield potential, good milling and grain quality. Small increases of these lines were planted for further evaluation and varietal release purposes. Although the advancement of rice production technology played an important role in recent yield increases, the majority of these yield increases can be attributed to new varieties developed in public rice breeding programs in the southern United States. Rice growers in Louisiana and other southern states are facing new challenges, such as low prices, conservation issues, and tight regulations of pesticide use. Improved long-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.

Source of Funds

State funds, Louisiana Rice Research Board, and the Rice Foundation

Importance of Preservative-Treated Wood When Rebuilding After A Hurricane

Todd Shupe **Renewable Natural Resources**

Key Theme: Forest Resource Management

Hurricanes Katrina and Rita caused tremendous damage to residential houses and other wood-based buildings along the Gulf Coast.

A publication entitled “;Use Preservative-Treated Wood When Rebuilding After A Hurricane”; was distributed to over 10,000 citizens immediately after the storms. Moreover, the publications was accessed by thousands more through the LSU AgCenter internet.

This publication has been distributed to over 10,000 people along the Gulf coast to rebuild their homes using treated wood, which will help ensure the long-term durability of the house in this high decay risk zone.

Source of Funds

Osmose, Arch Chemicals, Elder Wood Preserving, US Borax

Scope of Impact

Multi-state: 25% of the program is a result of a multi state effort. 7.1 FTES were devoted to the Forest Products effort, with an FTE valued at $80, 136. Therefore, the dollar value of the multi-state effort was $142,241.

Multi-function (integrated extension-research) efforts are estimated at 25% of the total number of FTEs expended in the program. These efforts included 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 $142,241. (7.1 FTEs x 80,136 per FTE x .25).

Impact of insect control strategies on sweet potato production in Louisiana

Richard Story Entomology

Key Theme: Integrated Pest Management

Soil insect pests of sweet potato cause a substantial amount of damage to the roots of sweet potato plants which results in a loss of revenue for growers. In a survey of over 60 fields in Louisiana over a three year period where untreated strips (no insecticides used) were maintained, 22% of all harvested roots had feeding scars caused by rootworms, white grubs, and other soil insect pests. Although the damage is mainly cosmetic, growers cannot sell roots with feeding injury as a US No 1 grade. Depending on the extent of the damage, the roots can be sorted out and sold as lesser grades for a reduced price, sold to the canner for almost no profit, or discarded for a complete loss. Although the loss of revenue is difficult to quantify, an estimate of the losses due to insects if no insecticides were used can be made ($11,316,096.00 in 2006).

A study was initiated in 2004 to examine the magnitude of the soil insect pest problem. We sought to determine which insect species were inflicting damage to the roots, determine their relative importance, determine the effectiveness of the pest management practices used by growers to reduce this damage, and determine if these control programs could be improved. Each year 20-22 fields were surveyed for insect activity and damage. Treatments in each field included 1) untreated plots, 2) plots where only pre-plant insecticides were used, and 3) plots where both pre-plant and foliar applied insecticides were used. Insects were sampled in the fields throughout the growing season. At harvest, roots in the plots were dug and evaluated for insect damage.

Rootworms were the most damaging pest across all 3 years. Average damage by rootworms in untreated plots was 16% across the three year period. Other insect pests (white grubs, flea beetles, wireworms, sugarcane beetles, and whitefringed beetles) collectively damaged less than 4% of the roots. Rootworm control with the grower applied pre-plant and foliar applications resulted in an average reduction in damage of 68%. The pre-plant only treatments (no foliar sprays) did not have a significant effect on rootworm damage relative to the untreated controls, suggesting that this control strategy contributed little if any to rootworm control. However, in experimental plots we are able to consistently reduce rootworm damage by 60% using this strategy. We determined that the growers were applying the chemicals too early in the season to be effective. We have been informing growers that the timing of application is critical. If growers had applied the pre-plant insecticides in an optimal way in 2006, they would have reduced rootworm damage by another 3.6%. In 2006, this would have resulted in an additional 231,465 boxes of US No 1 roots for an increase in revenue to the Louisiana growers of approximately 1,851,724.00.

DNA Marker Approaches to Genetic Improvement of Rice

Herry Utomo, Steve Linscombe, Xueyan Sha; Plant Breeding

Key Theme: Biotechnology

Rice is an important crop in the state of Louisiana's economy. Higher yielding varieties have been the driving force in this quarter billion industry. For many years, varieties developed in Louisiana are also a grower's choice in many parts of rice producing areas outside the state. Recent completion of rice genome sequences and advancement in various molecular aspects of rice, including DNA markers, proteomics, and metabolomics, provide a new avenue to deal with important traits more effectively during cultivar development. These molecular tools can be adapted to the conventional breeding program to improve its efficiency and shorten the breeding period. They can be used to breed quality traits to meet specific demands in the future market of more diversified consumers. A high level of precision in selecting the traits will make them a crucial part in continuing efforts to deliver high quality superior varieties to the rice industry.

A total of 14,000 rice headrows of F3 to F5 progeny lines derived from various crosses (two and multi-way) was evaluated in the field at the LSU AgCenter Rice Research Station in 2006. The crosses were made to pyramid major blast resistance genes while selecting for superior agronomic characters. Four hundred panicle heads were selected based on blast markers and high yielding characteristics, including more productive tillers, longer panicles, and bigger panicle size. Heading date, plant height, lodging, and plant stature were also included in the selection process. Additional marker selections are being

conducted in the greenhouse during a winter off-season for lines that do not possess homozygous blast resistance alleles. Currently available DNA markers and QTLs for a number of traits from diverse genetic backgrounds are being evaluated for their usefulness in the U.S. genetic background. Efforts to modify marker screening techniques to accommodate a large number of selections are continued by streamlining the process from collecting leaf samples in the field to DNA extraction, PCR amplification, and marker analysis. Hundreds of samples can be analyzed daily with an average cost of 34¢; per single marker (data point); 1¢; for DNA extraction, 29¢; for PCR reaction, and 4¢; for gel electrophoresis. A number of mapping populations is being developed to identify new markers for several qualitative and quantitative traits, including plant stature, aroma, water weevil tolerance, protein content, and yield components.

Successful application of DNA marker technology can greatly enhance the breeding process.

Source of Funds

State funds, Louisiana Rice Research Board grants

Salinity in the Sugar Belt

H. Viator, G. Breitenbeck, J. Flanagan, B. Joffrion, B. Legendre, R. Louque; Agronomy & Environmental Mgmt.

Key Theme: Soil Assessment & Remediation

Hurricanes Katrina and Rita deposited a considerable amount of salt throughout the coastal parishes of the Louisiana sugar belt. A survey, conducted shortly after the water ebbed, revealed soil salinity levels in several areas of six to eight times the published damage threshold. Growers and processors are asking if soil salinity will persist and to what extent has the 2006 crop been damaged.

Three methods were used to evaluate the effects of soil salinity on sugarcane production. The first approach was to monitor changes in salinity with time and rainfall and determine yield at the original survey sites. Secondly, microbial-based products, designed to reduce soil salinity, were evaluated at the two highest soil salinity sites identified in the survey. The last method was to sample partially flooded fields to compare salinity and yield levels between the submerged and non-flooded areas of the fields.

Averaged over all the sites in the initial survey, soil salinity decreased 69% from the time of the survey to the harvest season. Average yield was over 10,000 pounds of sugar per acre, based on hand-harvested samples.

Source of Funds

Research was sponsored by both a private company and state appropriations.

Herbicide Drift Identification and Management in Louisiana Rice Production

Eric Webster, Steve Linscombe; Agronomy & Weed Science

ey Theme: Agricultural Competitiveness

Several glyphosate-resistant crops, resistant to the herbicide Roundup, or Roundup Ready crops are currently grown in Louisiana. The most common crops are Roundup Ready cotton, corn, and soybean. Liberty-Link cotton, resistant to the herbicide glufosinate sold under the trade name Ignite, is also grown on a small scale in Louisiana. Clearfield rice, resistant to herbicides in the imidazolinone family, can be treated with imazethapyr sold under the trade name Newpath and imazamox sold under the trade name Beyond. These herbicide resistant crops have allowed producers to control weeds that were difficult or very expensive to manage. These technologies have reduced the cost of crop production and reduced the total amount of pesticides used. However, when these herbicides are applied under adverse weather conditions the herbicide spray can drift to non-target fields. In many cases these adjacent fields may have crops that are not resistant to Roundup, Ignite, Newpath or Beyond.

Four studies were conducted at the LSU AgCenter Rice Research Station near Crowley, Louisiana in 2006 to evaluate the effects of simulated herbicide drift on rice. The herbicides were applied at drift rates of 12.5 and 6.3% of the labeled usage rate of glyphosate as 22 oz/A of Roundup WeatherMax (drift rates of 2.8 and 1.4 oz/A), glufosinate as 24 oz/A of Ignite (drift rates of 3 and 1.5 oz/A), imazamox as 5 oz/A of Beyond (drift rates of 0.63 and 0.31 oz/A), and imazethapyr as 4 oz/A of Newpath (drift rates of 0.5 and 0.25 oz/A). Each application was made with the carrier volume varying proportionally to herbicide dosage based on a carrier volume rate of 25 GPA. The 12.5% herbicide rate was applied with a carrier volume of 3.1 GPA and the 6.3% herbicide rate was applied with a carrier volume of 1.6 GPA. The herbicides were also applied at four different stages of rice growth and development. The different application timings would allow us to evaluate how the crop responds when a drift event occurs throughout the growing season.

In Louisiana there was approximately 5000 acres of rice impacted by Roundup or Newpath drift in 2006. In Mississippi and Arkansas there were several thousand acres of rice and cotton affected by herbicide drift. Through this research this project has been able to recognize and identify drift events that occur on rice fields. Each herbicide evaluated in these four studies cause the rice to respond in different ways. For example, injury symptoms are very similar when comparing Roundup with Newpath and Beyond. However, through evaluation slight visual differences occur and can be identified. It is very important to correctly identify the correct herbicide that was drifted and the occurs throughout the growing season. severity of the drift. The management of the rice crop is different with a Newpath or Beyond drift compared with a Roundup drift. In many cases if a drift event occurs on small young rice, less than 3-leaf rice, the crop may be salvaged, but it may be more beneficial to replant. This is a very difficult decision for a producer to make; however, with the findings of this project we can better advise farmers on the best options available. As the crop matures and drift events occur later in the season symptoms change and management strategies are altered. Often times it is too late to replant and management decisions are based on minimizing the detrimental impacts of the drift event. These late season management decisions are usually based on permanent flood establishment and additional fertilizer applications. This research project will continue to aid producers of Louisiana and other surrounding states to minimize the impact of herbicide drift.

Source of Funds: Louisiana Rice Research Board

Effects of Pasture Stocking rate and Method on Cow-calf Production (Phase 2)

Wayne Wyatt, J.M. Gillepsie, D. C. Blouin, B. C. Venuto; Animal Sciences

Key Theme: Animal Production Efficiency

Most Louisiana beef producers have a cow-calf system of production. The principal environment in which these cow-calf systems must perform is forage based and pasture acreage is usually fixed throughout the year. There is considerable interest among beef producers in short-duration, rotational, or management-intensive grazing (MIG) systems as a way of improving production efficiency. However, no research has been conducted to evaluate the effectiveness of these systems in supporting a year-around, cow-calf system operating on fixed acreage within the forage environments (bermudagrass, dallisgrass, bahiagrass, annual ryegrass, etc.) available to Louisiana beef producers. It is important that continuous- and rotational-grazing schemes be compared based upon the following criteria: 1) for cow-calf production, 2) on a year-around basis, and 3) across an array of fixed stocking rates. Also, comparisons of continuous and rotational grazing schemes should be made at identical stocking rates.

A study was initiated at the Iberia Research Station that was designed to evaluate the effects of pasture stocking rate (low, medium, and high) and method (continuous and 8-paddock rotation) on cow-calf production. The second phase (2 years) of a long-term research project had the following grazing (stocking method-stocking rate) treatments: rotationally stocked (grazed; eight paddocks) at either a low, medium, or high stocking rate (RL, RM, and RH) and continuously stocked (grazed) at a medium stocking rate (CM). The first phase of the project had the following treatments: CL, CM, CH, and RH and results from that phase were reported previously. Brangus cows and suckling calves (seasonal) were stocked on treatment pastures on a year-around basis for two years. Low, medium, and high stocking rates were .5, .8, and 1.1 cows per acre, respectively. During periods when forage availability was insufficient, cow and calves were restricted to a drylot portion of each treatment pasture and fed hay and supplement. Periodic weights (approximately quarterly) of cows and their suckling calves were obtained throughout the 2-year period.

Similar to results reported for Phase 1 of this research project, stocking rate had a greater effect on cow weights and body condition scores than did stocking method. Cow weights and body condition scores were greater for cows on the low stocking rate treatment compared to those on the medium stocking rate treatment, but were similar among the medium and high stocking rate treatments. Cow weights and body condition scores were very similar for continuous and rotational stocked pasture management systems, when compared at a moderate (medium) stocking rate. Cows were confined to the drylot areas for an average of 36, 55, 86, and 67 days, respectively, for the RL, RM, RH, and CM treatments. Net hay reserves (dry sun-cured or haylage; hay or haylage harvest minus that fed) averaged 4.1, .1, -2.1, and -1.4 bales/cow, respectively, for the RL, RM, RH, and CM treatments. Calf birth weight, pre-weaning ADG, weaning weight, and adjusted 205-day weight were neither affected by stocking rate nor stocking method in this phase of the research. However, pasture weaning weight (cumulative weaning weight of calves on pasture divided by acreage) dramatically increased as stocking rate increased within the rotational treatments. It would appear that selecting a year-around, sustainable stocking rate, rather than stocking method, should be of greater concern for cow-calf producers along the Gulf Coast. While an economic analysis is pending, it may be that the fewer number of days in drylot, coupled with a positive net hay reserve, will result in a financial savings for the rotational vs continuous grazing methods at a medium stocking rate. However, conclusions should await a complete economic analysis of all input and output data.

Source of Funds

State

Development of Medium-Grain Rice Varieties for Louisiana

Sterling B. Blanche, Steve Linscombe; Agronomy

Key Theme: Agricultural Profitability

Rice is one of the most important plant commodities to the Louisiana economy. In 2005, 1383 rice producers grew rice on approximately 524,000 acres and the average yield was 6,105 pounds per acre. This resulted in $225 million gross farm value and $293 million total value, including value added by infrastructure sectors such as marketing, processing, and transportation. A major factor in this is variety development. In 2006, rice acreage and average yields per acre, for both medium-grain and long-grain rice, will be significantly lower than in 2005. High-yielding and agronomically superior varieties can have a direct impact on the rice industry by increasing yield, reducing production costs, and increasing milling quality. The ongoing trend of low prices and increasing input costs will continue to reduce the number of rice growers and the acreage dedicated to rice. High-yielding medium-grain varieties are needed to create a profitable climate for producers to meet domestic and export demand for medium-grain rice.

Medium-grain breeding activities in 2006 included 65 transplanted F1s, 66 space-planted F2s, and more than 10,000 early (F3) to advanced (F8) generation progeny rows. Seventy-five medium-grain entries were tested in a non-replicated preliminary yield trial and 50 were tested in a replicated yield trial in Crowley. The 2006 Uniform Regional Rice Nursery, a multi-location trial in five southern rice producing states, included eight medium-grain entries and the Commercial-Advanced Trial (six locations in Louisiana) included five medium-grain entries. Two of these lines in Crowley, LA2168 and LA2171, had good yield potential, short stature, early maturity, good milling quality, and ideal grain size. These lines will be tested in the URRN and CA in 2007 for further evaluation.

The development, release, and adoption of high-yielding rice varieties make rice producers more economically competitive in global markets. All areas of infrastructure benefit from these improved conditions. Disease-resistance incorporated into new varieties can reduce the cost of fungicide applications, thereby increasing the producer's bottom line and reducing the total amount of pesticide applications to the environment. Improvements in grain quality (size, shape, cooking quality) will secure or increase future domestic consumption and export demand.

Source of Funds

State funds, Louisiana Rice Research Board grants export demand.

Influence of Cultural Practices on Grain Sorghum and Small Grain Production on Northeast Louisiana Alluvial and Silt Loam Soils

Rick Mascagni **Agronomy**

Key Theme: Agricultural Profitability

Grain sorghum and wheat have become important components of cropping systems in northeast Louisiana. The recognition of sorghum's rotational benefits and availability of adapted hybrids have contributed to the increased acreage in grain sorghum production. Short-term rotational benefits include enhanced weed, insect, nematode and disease control, while long-term benefits include the maintenance of or increase in soil organic matter level. Grain sorghum hybrids are relatively drought tolerant and adaptable to clay soils. Although sorghum is one of the more tolerant crops to drought stress, maximum yield is possible only when plant growth and development is not restricted by environmental conditions. Wheat is very versatile and integrates well into multiple cropping systems. Producers need information on adapted hybrids/varieties and production practices that optimize yield and profitability for grain sorghum and small grains.

Research has focused on grain sorghum hybrid performance trials and wheat variety performance trials on both Mississippi River alluvial and Macon Ridge loessial soils. Research has generally shown that grain sorghum produces higher yields when row spacing is reduced from the standard 40-inch spacing on Mississippi River alluvial soils, while optimum row spacing depends on environmental factors on the Macon Ridge. Row spacing less than 40-inches is advantageous on the Macon Ridge only in years with adequate rainfall. Research has been initiated that compares twin rows (9.5-inch spacing) on 40-inch beds and multiple rows on 80-inch wide beds to the standard, single row on 40-inch beds. Research showed that wheat varieties have a tremendous ability to compensate for low stands by producing tillers. Wheat stands as low as eight to nine plants per square foot produced maximum yields, while stands as low as four to five plants per square foot produced 85 percent of maximum yield. For maximum yield and profit, stands need to be relatively uniform. Wheat soil fertility studies indicated that the highest need for sulfur was on coarse-textured, sandy Mississippi River alluvial soils.

Producers select from a list of recommended grain sorghum hybrids and wheat varieties produced by LSU AgCenter scientists and extension personnel each year. Performance trials are located around the state, providing yield performance and agronomic information across a range of soil types and environments. On poorly drained Mississippi River soils, production practices are being developed that allows the planting of grain sorghum in narrow rows on raised beds, which provides enhanced drainage and the opportunity to irrigate. In grain sorghum dryland production systems on the Macon Ridge, the optimum row spacing in most years is the standard, 40-inch wide row. Knowing the minimum number of wheat plants required for maximum yield, management decisions can be made regarding crop termination. In producer wheat fields, plant spacing is much more random than research plots and the decision to terminate a crop can be difficult. If large portions of the field have poor stands, then it is an easy call; however, when smaller areas within the field have low stands, then it is a more difficult decision. In these cases, it may be wise to keep the crop but decrease the total nitrogen fertilizer applied, knowing that the yield potential will probably be lower than areas of the field with adequate stands. Research indicates that sulfur fertility for wheat on Macon Ridge soils was less of a concern than on Mississippi River alluvial soils. On Macon Ridge soils, soil sulfur content accumulated with depth, while organic matter content and soil pH decreased.

Source of Funds

State funds, Louisiana Soybean and Grain Research and Promotion Board and seed company and agrichemical grants

Goal 2 – Extension Project Summaries

Food Safety Information to Prevent Foodborne Illnesses

Elizabeth S. Reames **Human Nutrition**

Key Theme: Food Safety

According to Centers for Disease Control (CDC) estimates, the toll from foodborne illness is 76 million illnesses, 325,000 hospitalizations and 5000 deaths in the United States each year. Those most at risk of serious harm are very young children, elderly people and people with immune systems compromised by HIV, cancer treatment, diabetes, lupus and other disorders. Pregnant women are also at risk; some foodborne disease can cause miscarriages. Research shows that proper food handling and preparation can prevent 90 to 95 percent of foodborne illnesses. Recommended food safety practices to prevent foodborne illness include cooking foods thoroughly, not allowing raw meats to contaminate other foods and washing hands. In 2005, LSU AgCenter Extension agents and specialists provided food safety information to Louisiana citizens, childcare providers and food handlers throughout the year, with increased emphasis on food safety issues related to power outages and flooding following hurricanes Katrina and Rita. Food safety information has been provided to Louisiana residents by one FCS nutrition specialist and 38 Extension agents who completed the National Restaurant Association SERVSAFE safe food handler program and have been registered as food safety instructors with the Louisiana Department of Health and Hospitals, Office of Public Health and the National Restaurant Association. Extension agents continued to conduct workshops using the Serving Food Safely curriculum for food service organizations, and the curriculum was included in the Disaster Recovery resource packet.

In FY 06, an estimated 100,000 Louisiana consumers and food handlers gained knowledge about recommended food handling practices from attendance at community and state food safety educational presentations; through mass media efforts, including news articles, radio & TV, and circular letters; and through the “;Safe Food Handler”; training program presented to food handlers at fairs, festivals, delis, schools, day care, nursing homes and other food service establishments. More than 100 New Orleans Jazz and Heritage food service personnel participated in a special safe food handler training. Since the beginning of this training in 2001, fewer violations have been cited at the annual event than in years prior to the trainings.

Serving Food Safely workshops were conducted for approximately 500 food recovery agency personnel and volunteers. Ninety-eight percent of participants demonstrated improved knowledge of recommended food safety practices based on pre- and posttest results.

Source of Funds

Funding Sources: Smith-Lever 3b, c; Family Nutrition Program - funded by USDA, FNS, through the Louisiana Dept. of Social Services, Food Stamp Program; USDA CSREES Restricted Fund S/L

Scope of Impact

Multi-state: 60% of the program is a result of a multi state effort. 16 FTES were devoted to the food safety effort, with an FTE valued at $80,136. Therefore, the dollar value of the multi-state effort was $769,305.60.

Multi-function: (integrated extension-research) efforts are estimated at 40% of the total number of FTEs expended in the program. These efforts included research-extension collaboration in agent training, formulation of recommendations and publications. The dollar value of the multi-function effort is $512,870.40. (16 FTEs x 80,136 per FTE x .40).

Evaluation of Rough Strains of Brucella abortus as Potential Vaccines Against Brucellosis in Cattle

Philip H. Elzer Veterinary Science

Key Theme: Animal Health

Vaccination of domestic livestock with efficacious vaccines against zoonotic pathogens like Brucella species is necessary to maintain a safe and reliable food supply. Presently, the current brucellosis vaccine is not as protective as predicted in domestic livestock in areas where wildlife reservoirs of the disease are prevalent. Vaccinating animals against brucellosis, specifically cattle and swine, with a vaccine that is safe and efficacious aids in the protection of domestic and wild animals from this zoonotic or potential agroterrorist pathogen.

Animals that had previously been vaccinated with B. abortus RB51 expressing protective antigens were challenged with virulent B. abortus. All animals remained negative on all routine diagnostic tests prior to challenge. Significant protection was noted against virulent Brucella challenge in all vaccinates. A novel rough B. abortus phosphoglucomutase (pgm) deletion mutant strain shows promise as a potential bovine vaccine. However, as a stable attenuated rough strain, the pgm strain must be capable of transient colonization in cattle without causing pathogenesis in pregnant animals prior to being considered a viable vaccine candidate. The vaccine strain colonized non-pregnant animals and did not cause any pathology when administered to pregnant animals.

Due to the continuous threat of disease transmission of brucellosis from the wildlife reservoirs, new vaccine candidates are needed to aid in the eradication program. As a zoonotic organism, Brucella species pose a human health threat; hence a protected animal population benefits the general public. A disease-free food animal population is imperative to the well-being of all individuals. 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”.

Animal Health, USDA cooperative agreements, State, and industry funds.

Saving Genetically Valuable Germplasm from Males

Robert Godke, Kenneth R. Bondioli; Animal Sciences

Key Theme: Germplasm Preservation

Livestock producers have been asking researchers for years to find a way to save germplasm from a genetically valuable breeding male that has died unexpectedly or becomes injured and can no longer breed naturally.

This station has successfully developed methods to harvest and store germplasm (sperm) from deceased beef and dairy bulls, using testicular epididymal sperm that had been stored in the testes for 24 hours at 4°Centigrade. Using these harvested epididymal sperm in a laboratory test tube (in vitro) fertilization (IVF) procedure has resulted in the production of good quality, transferable cattle embryos. The first epididymal sperm IVF-derived calves in the world were born at this station using this new methodology. This approach has now been developed for hunter-killed Whitetail bucks at this station and recently, epididymal sperm-derived Whitetail fawns have been produced using artificial insemination.

Being able to produce pregnancies from epididymal sperm from testes after 24 hours of storage at 4°Centigrade would allow livestock producers to save germplasm from injured or deceased genetically superior individuals.

Source of Funds

Federal Multistate W-1171 Research Project Funds

Quick Answers for Cercospora Disease Complex for Rice Farmers

Donald Groth Plant Pathology

Key Theme: Plant Disease Management

Southern rice farmers faced a new disease problem in 2006. A complex of disease symptoms on leaves, sheaths and heads produced by the fungus Cercospora caused significant rice yield and quality reductions in many fields. The disease is commonly know as narrow brown leaf spot and has been present in Louisiana as a minor disease for many years. In 2006, probably due to over wintering rice in crawfish fields and unusually wet conditions in July, the disease developed to severe levels never seen before. The severe infection levels caused reduced grain filling, poor milling, and reduced second crop regrowth. Farmers needed answers on which varieties to use in 2007 and if there were fungicides that would control the disease.

Fungicide trials and varietal disease resistance screening nurseries were established is existing plots late in the season to answer these questions. Fungicide timing, rate and efficacy trials were conducted on a susceptible variety that had disease starting to develop. Disease control, yield response, and milling quality data was collected from these plots and compared with the unsprayed check. A blast disease nursery was also utilized to evaluate resistance of rice varieties and breeding lines. This information was then provided to farmers during rice production clinics throughout Louisiana, Texas, and the information was provided to Arkansas specialists for their grower meetings.

Farmers are entering the 2007 production year with information that they can use to make educated decisions on varietal selection and fungicide effectiveness to use including rate and timing recommendations. Rice breeders also have information on resistance levels of their elite breeding lines that they can use to select against susceptibly to this disease. This is an example where Louisiana rice farmers have a targeted research program for their crop, their problems, in their area.

Source of Funds

Louisiana Rice Research Board

Pathogenesis of Edwardsiella ictaluri

Ronald L. Thune, D.H. Fernandez, M. L. Lawerence, D. Dyer, A. Gillespie, M.L. Rogge, N.J. Booth, C.A. Landry, J.L. Benoit, Smith, M.K., and R. Bologna; Veterinary Science

Key Theme: Aquatic Animal Health

The gram-negative enteric bacterium Edwardsiella ictaluri causes enteric septicemia of catfish (ESC), an economically significant disease of farmed-raised channel catfish, Ictalurus punctatus. Commercial catfish production accounts for 85-90% of the total fin fish aquaculture production in the United States, with almost 300,000 tonnes produced annually. Significant losses due to ESC were reported on over 60% of all farms in operation.

Work completed includes partial completion of the E. ictaluri genome sequence and the identification of 34 genes that encode proteins with putative roles in the pathogenesis of E. ictaluri, including 10 proteins with known functions in other pathogens, 11 hypothetical proteins with known functions from other pathogens, and 13 proteins with no matches in the bacterial databases. Using bioinformatics and the E. ictaluri genomic database, all of those putative virulence factors were analyzed, and several were identified as having a strong likelihood of involvement in intracellular replication. Phenotypic characterization of strains carrying mutations in those genes confirmed that each are required for virulence in channel catfish and for successful survival and replication within channel catfish head-kidney derived macrophages (CC-HKDM). Analysis of the putative biological activities of the associated genes enabled the development of a unique preliminary model to explain the mechanisms associated with intracellular survival and replication of E. ictaluri. Confirmation of this model is the basis of a recently submitted USDA NRI-CGP proposal. A full knowledge of the pathogenesis of E. ictaluri will enable the development of unique prevention and control measures.

Source of Funds

USDA National Research Initiative Competitive Grants Program
USDA Aquaculture Special Grant

Food Stamp Nutrition Education Program in Louisiana

Annrose M. Guarino, Martha Weston, Emily Whelan; Human Ecology

Key Theme: Human Nutrition

Conditions of poverty are significant in Louisiana. In 1999, 19.6% of Louisiana's population lived in poverty, and the rate is highest among young families and female-headed households. Children younger than 18 are Louisiana's poorest age group - 26.3% live in poverty. Poverty makes it difficult for families to meet basic human needs for food and good health. Also, 37.1% of people 65 years and over live below 150% of poverty rate. Research shows that rates of overweight, obesity and other chronic diseases are higher among low-income, low-literacy populations than among other groups. According to the Office of Public Health, over half of Louisiana`s deaths are due to heart disease and cancer, illnesses with risk factors that we can control through changes in our behaviors (e.g., improved nutrition).

Extension Family and Consumer Science agents covering fifty-six (56) parishes and twenty-five (25) 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-five 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, food buying/budgeting, and gardening education. A monthly newsletter covered different nutrition topics: physical activity, fats, nutritional content and benefits of different foods, and commodity foods. Reported sites for the FNP outreach program included OFS, commodity distribution sites, WIC, eligible low income schools, and Head Start centers. FNP program faculty received a list of parish Food Stamp recipients. The 56 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.

Over 215,590 people in 56 parishes were reached with information on nutrition, diets and health, food safety, gardening education, and food buying through the FNP program. The most significant achievement was collaboration with eligible schools, reaching and educating low-income children about nutrition, healthy eating habits, and importance of regular physical activity. Agents and nutrition educators conducted programs in eligible schools, for over 38,428 youth (pre-K - 12th grade) in FNP schools statewide. Head Start students included 26,207 youth. The majority of individuals indicated that they learned about several nutrition and health-related concepts. Additionally, over 80% 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.

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

Who Wants to be a Camp Counselor?

Lanette Hebert, Debbie Bairnsfather, Joe Bairnsfather, Angie Arnold; 4-H Youth Development

Key Theme: Training Youth Camp Counselors

One of the most critical and sought after teen leader positions is that of camp counselor. A newly developed camp counselor training program was implemented as a component of the revamped Louisiana 4-H summer camping program that is available for 9-12 year old youth. Phase 1 of the training comprised of 6 hours was implemented in several group settings statewide. In the pilot year of this training over 300 youth representing all areas of the state completed the training and reported a better quality camp experience. Camp management and faculty report a decrease in discipline problems with counselor and a noted improvement in counselor's work. The training is grounded in youth development theory and

application.

Many youth strive to serve in a camp counselor role during their 4-H career. Recent findings on camp counselor experience indicate that serving in that role led to significance experiences in such areas as positive relationships, teamwork, social skills, responsibility and leadership (Carter, 2006: Brandt & Arnold, 2006). These findings are supported by other research that indicates that camping participation helps teens develop leadership and life skills (Thomas, 1996; Purcell, 1998).

In an effort to strengthen the camp counselor experience and the 4-H camping program, a consistent statewide training program was developed and implemented. The six hour program is based on the Essential Elements and includes segments targeting Belonging (relationship building, personalities, team building, conflict resolution, health & safety) Mastery (development stages, experiential learning), Independence (leadership skills), and Generosity (service, motivation). The interactive training uses the design of popular games (Win, Lose or Draw; Family Feud; Scrabble) to engage participants. The intended audience for the training is youth in grades 8 to 12 with counselor selection encouraged at the end of the 9th grade year. In an effort to provide other statewide learning opportunities, trainings were conducted at state, regional and multi-parish levels reaching 300 youth in the inaugural year.

In the pilot year of the program, 300 youth completed the training and reported a better quality camp experience.

Source of Funds

Internal

Building Healthy Bodies and Active Minds: The Impact of the Smart Bodies Program in 2006

Ellen Murphy, Denise Holston, Michael Zanovec; Human Ecology

Key Theme: Human Health

Obesity is a growing healthcare problem in Louisiana, and carries with it significant costs, both in terms of dollars and lives. The number of overweight or obese youth also continues to rise. One statistic from New Orleans estimated that 31% of African American school-age children were overweight or obese. Other reports have shown that prevalence of overweight/obesity in high school students range from 13-16%. Because being overweight or obese puts an individual at an increased risk for nutrition-related chronic diseases such as cardiovascular disease, type II diabetes, and some cancers, it is important to enable children to establish preventative health behaviors early in life. This can be confronted only through comprehensive health programs designed to educate and change behaviors in a variety of settings, beginning with the classroom.

Smart Bodies is an interactive, comprehensive nutrition education and physical activity program designed to teach elementary school children how to build strong bodies and develop active minds. Smart Bodies targets children in grades K-5 and integrates classroom activities with hands-on learning. Smart Bodies consists of three components: the Louisiana Body Walk, an interactive exhibit representing the human body, and the OrganWise Guys and Take 10! curricula, which are school based nutrition education and physical activity programs. Additionally, a formal research component was conducted by Dr. Georgianna Tuuri in East Baton Rouge Parish to assess the effectiveness of the program in promoting child wellness and decreasing childhood obesity rates. Smart Bodies is a public-private partnership between the LSU AgCenter and Blue Cross and Blue Shield of Louisiana Foundation. The Family Nutrition Program, Pennington Family Foundation, and the National Center for Homelessness have provided additional funding, which has enabled additional schools to receive the program. As of December 2006, 32 parishes and 101 schools participated in the Smart Bodies Program. Additionally, 37,000 elementary school children went through the Body Walk. In addition to the 2 year, formal research project (described below), student pre and post evaluations were conducted in 5 elementary schools (at time of report). Results for pre and post surveys indicate that the overwhelming majority of students increased knowledge regarding nutrition, physical activity, and anatomy after participating in the program for at least 12 weeks. Students also commented, “;the most, best thing about the body is the heart because he pumps blood,”; and “;I learned to drink 8 glasses of water and to wash my hands.”; Teachers also commented, “;Loved it! The children really enjoyed this and learned a lot,”; and “;activities were excellent and hands-on.”; The two-year formal investigation was conducted among eighteen elementary schools in East Baton Rouge Parish. Schools were pair-matched and then randomly assigned to a treatment or control group. Only fourth and fifth grade students with

parental consent were included in the research.

The primary goals of the research project were: to increase consumption of fruits and vegetables and participation in physical activity, to increase parent awareness of their child`s weight status, and to decrease the number of students in at risk for overweight or overweight categories.

Based on students` pre- and posttests, physical activity knowledge scores improved by 15% in the intervention group, compared to 8% in the control group. Nutrition knowledge scores increased by 10% in the intervention group, compared to 5% in the control group. Students` willingness to taste fruits and vegetables served at school increased by 5% vs. 3% in the control group.

In order to evaluate physical activity objectively, a subsample of students wore activity monitors on their wrists for seven consecutive days before and after the twelve week program.

Source of Funds

Primary contributor: Blue Cross and Blue Shield of Louisiana Foundation Other contributors: Family Nutrition Program, Pennington Family Foundation, National Center for Homelessness, and the American Dental Association

Help a Friend, Help Yourself Diabetes Awareness Program

Elizabeth S. Reames, Marie Lemoine, Debbie Melvin, Sarah Williams; Human Ecology

Key Theme: Human Health

Diabetes is a serious disease that affects the body's ability to produce or respond properly to insulin, a hormone that allows blood glucose (sugar) to enter the cells of the body and be used for energy. Diabetes is the fifth deadliest disease in the U.S. and it has no cure.

According to the American Diabetes Association, nearly 21 million children and adults in the United States, 7% of the population, have diabetes. Another 54 million Americans have pre-diabetes, a condition that puts them at serious risk for developing type 2 diabetes. About 176,500 people aged 20 years or younger have diabetes. This represents 0.22% of all people in this age group.

About one in every 400 to 600 children and adolescents has type 1 diabetes. Most children with diabetes have type 1. Type 1 diabetes is one of the most common chronic diseases in school-age children. About 150,000 young people in the United States under age 18 have type 1 diabetes. Each year, more than 13,000 youth are diagnosed with type 1 diabetes.

Although type 2 diabetes can occur in youth, the nationally representative data that would be needed to monitor diabetes trends in youth by type are not available. Clinically-based reports and regional studies suggest that type 2diabetes, although still rare, is being diagnosed more frequently in children and adolescents, particularly in American.

The Help a Friend, Help Yourself Diabetes Awareness education program for upper elementary school children was developed at the direction of the state diabetes task force to include in the recommended school health resource list in response to state legislation. The legislation requested the development and implementation of age and grade appropriate curricula for diabetes awareness education in the school system, and was enacted following the death of a 10-year-old boy with unrecognized type 1diabetes and in recognition of the increased incidence of type 2 diabetes in children and youth in the state.

An Extension nutrition specialist and 4-H agent, who are both Registered Dietitians, wrote the curriculum, which was reviewed by a team including Extension and 4-H faculty, La. Dept. of Education nutrition and science specialists, a school nurse, and a physician from the LSU Health Sciences Center.

The curriculum follows the state education department's content standard benchmarks and provides information about type 1 and type 2 diabetes, the two major types of diabetes, and the symptoms of diabetes, and encourages children to alert an adult if they or a friend experience those symptoms. The curriculum also focuses on healthy eating and physical activity to

maintain a healthy weight, which may help prevent or delay type 2 diabetes.

The curriculum includes a series of four lessons with lesson plans, fact sheets, power point presentations, an interactive exhibit, and evaluation instrument.

The curriculum was pilot-tested in 4-H club meetings in Lafourche Parish and Franklin Parish and has been provided to parish agents for presentation to youth.

Approximately 1000 youth have participated in the Help a Friend, Help Yourself Program. Evaluations from program participants show an increased awareness of diabetes, its symptoms and the importance of healthy eating and physical activity to prevent or delay the development of type 2 diabetes. An outgrowth of the program is the formation of small food and fitness groups that meet regularly to receive additional information about healthy eating and physical activity and participate in nutrition and exercise activities.

Source of Funds

Regular state funding - no special funds

Multi-state: 20% of the program is a result of a multi state effort. 2 FTES were devoted to the youth diabetes effort, with an FTE valued at $80, 136. Therefore, the dollar value of the multi-state effort was $32,054.40.

Multi-function (integrated extension-research) efforts are estimated at 75% of the total number of FTEs expended in the program. These efforts included research-extension collaboration in agent training, formulation of recommendations and publications. The dollar value of the multi-function effort is $120,204. (2 FTEs x 80,136 per FTE x .75).

Expanded Food and Nutrition Education Program in Louisiana

Heli J. Roy, April Cintron; Human Ecology

Key Theme: Human Nutrition

Recent data indicates 18.3% of Louisiana's population and 24.7% of Louisiana's children live in poverty, which places Louisiana in second for the highest poverty level in the United States. According to America's Health Rankings 2006 Louisiana ranked 50th, as the unhealthiest state due to factors such as high rates of obesity and childhood poverty. Poverty is linked to nutritional status, health status and educational attainment. Approximately 65% of Louisiana's population was either overweight or obese, while 64% of persons below the poverty level in Louisiana were overweight or obese. One in three Louisiana school-aged children is overweight and 1 in 4 overweight children have the early signs of Type 2 diabetes. Louisiana also has a high teen pregnancy rate. Research shows that teen pregnancy rate is linked to poverty and educational level. 19% of children in Louisiana live in homes were the household head did not complete high school.
The mission of the Expanded Food and Nutrition Education Program is to empower limited resource families and youth to improve their health, to have a better quality of life through improved diets, and to make a better selection when buying foods by managing their food budgets and related resources. In 2005-2006, the LSU AgCenter's EFNEP program was supervised by 9 agents in 10 parishes. Thirty EFNEP nutrition educators conducted a special nutrition education program for low-income families with young children. The program consisted of a 12 lesson curriculum and was used by nutrition educators to educate the enrolled participants in either individual or small group settings. To graduate from the program, participants completed a minimum of 10 of the 12 lessons. Ninety-two percent of the 1,108 enrollees completed the program. Through EFNEP, families learned about healthy eating, making nutritious choices, and extending limited resources when shopping for food. EFNEP also worked cooperatively with other food assistance programs such as food stamp, WIC and commodity foods.

In 2005-2006 there were paired entry and exit food recalls taken on 1,037 homemakers enrolled in the EFNEP program. Results are as follows:

*At entry, 66 percent of homemakers consumed no fruit and only 16 percent consumed the recommended number of 2 or more servings of fruit a day! However, at exit 61 percent consumed 1 or more fruits daily with 34 percent consuming 2 or more servings of fruit per day.

*Upon program initiation 69 percent of homemakers consumed no vegetables and only 29 percent consumed the recommended 3 or more servings per day. By program completion 47 percent were consuming the recommended daily intake of 3 or more vegetables servings per day with 86 percent of all homemakers consuming at least 1 vegetable per day.

*Dairy intake increased from 40 percent to 55 percent. 2 or more servings of milk were consumed by only 13 percent at program entry, increasing to 28 percent by program exit.

*Meat consumption of 2 or more servings increased from 46 percent to 56 percent.

*The consumption of breads and cereals (6-11 servings) increased from 25 percent to 34 percent from program entry to exit.

*Upon entering EFNEP, 8 percent of homemakers consumed at least one serving of each of the food groups. At exit, 30 percent of homemakers consumed one or more servings of each of the food groups.

At Program Exit:

*64 percent (564) more often planned meals in advance.

*57 percent (499) made healthy food choices when deciding what to feed their family.

*47 percent (409) more often prepared food without adding salt.

*72 percent (631) more often read labels

*48 percent (425) reported that their children ate breakfast more often.

There were 6177 EFNEP youth enrolled during FY05-06.

Source of Funds

Smith-Lever 3b + c

Goal 3 – Research Program Reports

Probiotic weight loss yogurt

Kayanush Aryana, Marlana Guillory; Animal Sciences

Key Theme: Dairy Foods Development

Obesity is a major health problem in the United States. According to United States Surgeon General, obesity related complications cause about 300,000 Americans to die every year. In 2005, the Center for Disease Control and Prevention stated that medical costs of obesity reached $75 billion. A novel form of (-) hydroxycitric acid is being marketed as a weigh loss ingredient. It is an all natural ingredient clinically proven to reduce body weight, curb apetite, burn fat and maintain healthy cholesterol levels. It has a Generally Recognized As Safe (GRAS) status and so can be used in yogurt manufacture. The manufacturers` of this ingredient claims that "no other diet ingredient has been proven safer and more effective". The manufacturers recommend a consumption of no more than 4500 mg per day. Low fat dairy foods have been cited as possibly having an anti-obesity effect by modulating adipocyte metabolism. Dairy calcium and certain whey fractions play a role in the anti-obesity effect. Yogurt is a dairy product that can be consumed as a snack or a dessert. Probiotics are live microorganisms which when administered in adequate amounts confer a health benefit on the host. Lactobacillus acidophilus is one of the most effective forms of probiotic (good helpful) bacteria discovered. Health benefits of Lactobacillus acidophilus are: it can provide immune support for infections or cancer, provides a healthy replacement of good bacteria in the intestinal tract following antibiotic therapy, reduces occurrence of diarrhea in humans (children and adults), aids in lowering cholesterol, improves the symptoms of lactose intolerance. A probiotic weight loss yogurt is a much needed product.

Probiotic weight loss yogurts were manufactured with a constant amount of Lactobacillus acidophilus (10E9 cfu/g yogurt mix) and (-) hydroxycitric acid incorporated at the rate of 0, 1.5, 3.0 and 4.5 g per 8 oz of yogurt. The pH, syneresis, viscosity, lactic acid bacterial counts, color and sensory characteristics were evaluated at weeks 0, 1, 3 and 5 of yogurt manufacture. Product characteristics were studied at weeks 0, 1, 3 and 5. Product manufacture was replicated three times. The pH of the control was significantly higher than the treatments. With an increase in the weight loss ingredient (WLI) there was a significant decline in pH. With an increase in storage time there was a significant decrease in pH. Syneresis is the whey released from the product. As storage time increased the syneresis increased. The control had significantly (p<0.05) higher syneresis compared to the treatments. Within the treatments as the amount of WLI increased the syneresis decreased. The viscosity of the control declined with storage time. The viscosities of the treatments increased on storage. The viscosity of the treatments were significantly lower than the control. With an increase in WLI there was a significant decrease in viscosity. The lactobacilli counts of the control were significantly higher than the treatments. There were significant differences amongst all treatments and the counts significantly declined with an increase in WLI. Week 0 had significantly the highest counts. The counts at week 1 were significantly higher than counts at week 3 which in turn were significantly higher than those at week 5. Compared to the control, the treatments had significantly lower L* (lightness - darkness), implying that the treatments were darker. As the usage of the WLI increased and as storage time increased there was a significant steady decrease a* (red - green) values and a significantly and steady increase in b* (yellow - blue) values indicating that the product became increasingly greenish yellow. This can be explained by an increase in syneresis (released serum) over time. The dissolved riboflavin in the whey / serum is responsible for the greenish yellow hue of the serum. There were no differences between the flavors of the control and yogurts with WLI incorporated at 1.5g. The flavor scores significantly dropped with an increase in WLI to 3.0 and 4.5g because the yogurts became increasingly sour. The yogurts with 4.5g WLI had significantly the lowest body texture scores compared to the control and other treatments.

Incorporation of WLI did not adversely effect the appearance of the product and increased its b* values. The WLI (-) hydroxycitric acid, incorporation lowered product pH, syneresis, lactobacilli counts, flavor scores, body texture scores and L* (lightness) values. A successful probiotic weight loss yogurt can be manufactured with the weight loss ingredient (-) hydroxycitric acid usage level of 1.5g per 8 oz of yogurt. Probiotic weight loss yogurts can successfully be manufactured especially for obese consumers.

Source of Funds

Hatch and State Funds

Health beneficial bacterial dose effect on yogurt characteristics.

Kayanush J. Aryana, Douglas Olson, Michelle Faciane; Animal Sciences

Key Theme: Dairy Foods Development

Lactobacillus acidophilus offers a range of health benefits which include: providing immune support for infections or cancer and a healthy replacement of bacteria in the intestinal tract following antibiotic therapy, reducing occurrence of diarrhea in humans (children and adults), aiding in lowering cholesterol, and improving the symptoms of lactose intolerance. Antitumor effect of L. acidophilus was reported by Goldin and Gorbach (1984). To provide health benefits, the suggested concentration of L. acidophilus is 10E6 cfu/g in a product. The L. acidophilus counts decline over the shelf life of yogurt and ice cream. This implies that a dose greater than 10E6 cfu/g of L. acidophilus needs to be incorporated during yogurt manufacture to end up with at least 106 cfu/g over the shelf life of the product. Increases in inoculation doses of L. acidophilus could favorably or adversely affect characteristic influencing yogurt quality.

Two separate experiments were conducted. In experiment 1, yogurt mixes were inoculated with minor (0.05%) increments in doses of L. acidophilus namely 0, 0.05, 0.10 and 0.15% v/v of yogurt mix. In experiment 2, yogurt mixes were inoculated with major (10 fold) increments in doses of L. acidophilus namely 0 (control), 0.0239%, 0.238%, and 2.33% v/v of yogurt mix. The pH, syneresis, viscosity, lactic acid bacterial counts, color and sensory characteristics were evaluated over the shelf life of the product. Product manufacture was replicated three times.

Minor (0.05%) increments in doses of L. acidophilus increased syneresis (released whey) and lactobacilli counts, decreased pH, but did not affect color (L*, a* and b* values) and flavor, appearance and body and texture scores of the yogurts. With major (10 fold) increments in doses of L. acidophilus there were minor differences in properties of the control yogurt and the yogurt inoculated with 0.0239% L. acidophilus. Yogurts inoculated with 0.238% L. acidophilus had slightly lower lactobacilli counts, higher pH, more syneresis, and higher apparent viscosities than the control yogurt and the yogurt inoculated with 0.0239% L. acidophilus, but their flavor scores and body and texture scores were comparable to the control yogurt and the yogurt inoculated with 0.0239% L. acidophilus. Excessively high inoculated levels of L. acidophilus (2.33%) prolonged the yogurt incubation time and resulted in an inferior quality yogurt. This yogurt had lower lactobacilli counts throughout storage and lower L. acidophilus counts from wk 4 to 7 of storage than the yogurt inoculated with 0.238% L. acidophilus. The present study showed that increasing L. acidophilus doses at low (0.05%) levels results in benefits but increasing doses at high (10 fold) levels results in a less healthier (lower acidophilus counts) and a poor quality product. Health benefits from L. acidophilus (high acidophilus counts) and good quality yogurts can best be obtained using low doses (up to 0.15%) of this health beneficial bacterium.

Source of Funds

Hatch and State Funds

Yogurt Manufactured With an Immune Enhancer

Kayanush J. Aryana, Olga Cueva; Animal Sciences

Key Theme: Dairy Foods Development

Arabinogalactan possesses immune-enhancing, mitogenic, antimutagenic, gastroprotective, antimicrobial, and prebiotic properties. Scientists have found that arabinogalactan blocks bacteria and viruses from attaching and binding to cell membranes in the liver and other organs, thus preventing infection from starting. Arabinogalactan has been shown in both human and animal studies to enhance the number of immune cells present in the blood. Human studies, conducted at several major U.S. universities, showed increased immune cell proliferation at consumption levels of about 1.5 g/day. Larch arabinogalactan is approved by the U.S. Food and Drug Administration (FDA) as a source of dietary fiber, but also has a potential therapeutic benefit as an immune stimulating agent and cancer protocol adjunct. The larch arabinogalactan has a caloric content of 1.4 kcal/g and do not increase insulin levels. Larch arabinogalactan is a prebiotic fiber. It is not digested, but passes through the stomach and small intestine into the large intestine where it is actively fermented by beneficial intestinal microflora, thereby increasing beneficial anaerobes, such as bifidobacteria and lactobacillus, while decreasing

Clostridia (11,15). Yogurt is a fermented product made using lactobacillus and incorporation of larch arabinogalactan can favorably or unfavorably alter quality characteristics of an immune enhancing yogurt.

Fat free plain yogurts were manufactured by incorporating an immune enhancer larch arabinogalactan at 0, 1.5, 3.0 and 4.5 g per 228 g (8 oz) cup of yogurt. The total solids in the control (no larch arabinogalactan) were kept constant with the treatments by adding nonfat dry milk to the control. Viscosity, syneresis, pH, color and sensory evaluation (flavor, body and texture, appearance and color) of the yogurts were determined at 1, 7, 14 and 21 days after yogurt manufacture, and microbial counts were determined at 7, 14 and 21 days after yogurt manufacture.

Use of the immune enhancer, larch arabinogalactan, significantly effected pH and instrumental color but did not influence apparent viscosity, syneresis, and the sensory attributes namely flavor, appearance and color, body and texture. Incorporation of immune enhancer, larch arabinogalactan, did not adversely effect most of the characteristics of fat free plain yogurt especially the sensory characteristics. Use of immune enhancer larch arabinogalactan, can be recommended in yogurt manufacture at levels as high as 4.5 g per 228 g (8 oz) cup of yogurt.

An immune enhancing yogurt can successfully be manufactured.

Source of Funds

Hatch and State Funds

Yogurt Manufactured Using A Novel Dietary Fiber with Several Health Benefits.

Kayanush J. Aryana, Brad Trammell; Animal Sciences

Key Theme: Dairy Foods Development

A novel dietary fiber namely Ceolus Fiber DF-17, is being marketed as a dietary fiber with excellent physiological functions. It is a dietary fiber composite consisting of water-insoluble dietary fiber (microcrystalline cellulose) and water-soluble dietary fiber (resistant maltodextrin). It combines the advantages of the water-insoluble dietary fiber (microcrystalline cellulose); namely improvement in bowel movements, increased amount of feces, prevention of colon cancer and the advantages of the water-soluble dietary fiber (resistant maltodextrin); namely lowering serum cholesterol level, improving glucose tolerance and improving intestinal flora.

Many Americans are not getting sufficient fiber in their diet. The American Dietetic Association recommends that a healthy diet should include 25 - 35 g of dietary fiber daily. Milk does not contain fiber, hence a milk product like plain yogurt does not contain fiber. Incorporation of a novel dietary fiber with several health benefits in dairy products would add to the choices of foods available to consume fiber

Fat free plain yogurts were manufactured using standard procedure. Ceolus Fiber DF-17 was incorporated at the rate of 0, 0.5, 1 and 1.5%w/v yogurt mix. Product manufacture was replicated three times. Product characteristics were studied at weeks 0, 1, 3 and 5.

Incorporation of Ceolus Fiber DF-17 did not adversely effect the flavor and appearance of the product. Ceolus Fiber DF-17 addition favorably effected the viscosity, syneresis, body and texture of the product. Ceolus Fiber DF-17 can be recommended for incorporation to as high as 1.5% w/v in yogurts. It is possible to enjoy the health benefits of Ceolus Fiber DF-17 in yogurt. A dairy product containing a fiber with several health benefits can successfully be manufactured contributing to the choices of foods available to increase fiber consumption.

Source of Funds

Hatch and State Funds

Dietary Resistant Starch Has A Great Impact on the Expression of the Genome in Cells of the GI Tract

Michael Keenan, Jun Zhou, Richard Tulley, Maren Hegsted, Anne Raggio, Kathy McCutcheon, Susan Newman, Ian Brown, Anne Birkett, Roy Martin; Human Ecology

Key Theme: Human Nutrition & Health

The gastrointestinal tract (gut) is a very important organ system in the body. The gut interacts with the brain through the endocrine and nervous systems to affect food intake, and plays a major role in our immune defenses. The American population does not consume enough whole grains, fruits and vegetables, which are our sources of fiber in the diet. Too little fiber in the diet may result in early onset of chronic diseases. Fiber is a complex group of substances, but fiber can be categorized into fermentable and non-fermentable. A variety of dietary fiber sources is beneficial for health. However, fermentable fibers result in the production of short chain fatty acids (SCFA), such as acetate, propionate and butyrate. The SCFA are preferred energy sources for cells of the large intestine, affect the health of the gut, and may affect signaling from the gut to the rest of the body.

Our group had demonstrated that resistant starch (RS), a fermentable fiber, in rat diets resulted in increased transcripts of peptide YY and glucagon-like peptide 1 in cecal cells. These gut hormones affect energy balance. The gut produces many hormones and sends signals (nervous, immune, etc.) to other organs. Studies could be performed measuring several hormones and signals, a few at a time. Instead, our group performed a gene array on the cecal cells of the large intestine of rats to investigate the effect of RS on expression of the entire genome. Three treatment groups were included: a standard control diet (SC), a resistant cornstarch (RS) diet, and an energy control (EC) diet. Inclusion of RS in a diet results in dilution of the energy density because of reduced digestibility compared to highly digestible cornstarch included in SC. Non-fermentable cellulose was added to the EC diet to reduce energy density to match the RS diet. Through the performance of a gene array with the three treatments, our research group would be able to tease out the effects of energy dilution (SC vs. EC), fermentation (RS vs. EC), and possible additive effects of both energy dilution and fermentation (RS vs. SC).

LSU AgCenter, Pennington Biomedical Research Center and National Starch and Chemical Company scientists study mechanisms of benefits of fermentable fibers in the diet. Our research team performed a gene array and determined that dietary resistant starch (RS) produced vast differences in expression of the rat cecal (first segment of large intestine) genome compared to controls. Transcripts for several hormones were increased for RS compared to an energy control group (gene, fold increase): amphiregullin, 25.6; epiregulin, 7.8; proglucagon, 6.9; adrenomedullin, 5.3; interleukin 1α, 5; resistin-like gamma, 3.6; natural killer cell protease, 2.6; presenelin, 2.1; vascular endothelial growth factor; 2.8; and peptide YY, 1.6. Pathways significantly affected by dietary RS included several for cell proliferation as well as the apoptosis (cell death) signaling pathway. Several anti-cancer genes (e.g., polo-like kinase 3, 25.2; glutathione S-transferase Yc, 10.6; histone deacetylase 6, 2.1) were also positively affected by RS. One hypothesis is that dietary fermentable fiber results in self destruction of tumor cells while promoting proliferation of the gut. Feeding RS may be a breakthrough for treatment of obesity, diabetes, and cancer, because it is a natural way to increase endogenous gut hormones. These hormones, as well as neural and immune signals will proceed from the gut to other tissues and organs throughout the body. Recent scientific literature has shown that resistant starches may be effective in treating mammary, prostate and esophageal cancers. This supports our hypothesis that dietary fermentable fibers will improve the health of the whole body and not just the gut. A reformulation of the diet to include fermentable substances such as resistant starches may lead to a healthier phenotype for consumers through nutrient gene interactions. Thus, this has far reaching implications and demonstrates how the LSU AgCenter is leading the way to improve the nutrition and health of not only Louisiana consumers, but also consumers throughout

Source of Funds

State, Hatch, Biotechnology AgCenter Interdisciplinary Team, National Starch and Chemical Company

Bioprocessing and Value-added Processing of Food and Agricultural By-products

Marybeth Lima, Cristina Sabliov, Dorin Boldor, Sam Godber, Zhimin Xu, Steve Linscombe; Biological and Agricultural Engineering

Key Theme: Improved Food Processing Technology

Food and agricultural products represent an important part of the state's economy. Methods to process these foods efficiently, economically, safely, and with minimal environmental impact are important. This research focuses on rice, which contributed almost $300 million to the state's economy in 2005. Our objectives were to develop methods for the efficient milling of existing and newly developed rice varieties and to develop methods to extract and characterize high-value components of the rice bran layer. Rice bran is a waste product of the rice milling process, and finding ways to use bran will alleviate environmental impact. This research has important economic impact for the state. Additionally, components extracted from rice bran have significant health benefits.

Research was conducted in two broad areas: (1) optimizing the yield and quality of common Louisiana rice varieties (Cocodrie, Cheniere, and Cypress) through milling, and (2) optimizing the concentration of high-value, healthful components in rice bran through milling and extraction. Deliverables include a model that enables rice millers to adjust machinery to produce optimal yield and quality of three Louisiana rice varieties, and methods that increase the amount of healthful components obtained from processing rice bran up to 20 fold over conventional methods. These healthful components include rice bran oil (healthy lipid profile and excellent cooking and taste characteristics), oryzanol and vitamin E (antioxidants), protein (high quality and hypoallergenic), and rice bran saccharide (an anti-tumor agent). Methods include rice bran fractionation, in which the overall bran layer is split into several fractions, and microwave assisted extraction, which enhances the efficiency of extraction of high-value, healthful components.

In terms of optimizing the yield and quality of common Louisiana rice varieties, models were developed that enable a miller to optimize rice yield and quality based on measures that the miller can choose to maximize or minimize. The yield is the percent of whole rice obtained after processing (milling); the percent broken, whiteness of the kernel, transparency of the kernel, and the degree of milling (DOM), a measure of bran removal from the rice kernel, are quality parameters that are important for economics and consumers. A miller can choose the degree of importance of each yield and quality parameter, and will obtain milling settings that can be used to optimize the processed rice accordingly. This model has direct economic benefits because parameters that increase the economic value of rice can be maximized.

In terms of value-added studies, we found that different rice varieties have different concentrations of high-level components in their bran layers. The goal of this research is to produce maximal amounts of high-value components from rice bran for use in pharmaceuticals, functional foods, or other products of interest. Our most important finding is that high-value components contained in the rice bran layer tend to be concentrated in the outer bran layer, or bran layer fraction (this was true of all varieties tested). Thus, much less bran needs to be processed to obtain a higher than average concentration of component (compared to the concentration of component over the entire bran average). Rice bran saccharide (RBS) in the rice variety Cheniere gave the best results, with 54% of the total amount of RBS concentrated in the outer 17% of the bran layer. This work is significant because the process for obtaining high-value, healthful components from rice bran oil is up to 20 times more efficient than standard processes.

Source of Funds

The Louisiana Board of Regents
The Louisiana Rice Research Board
The College of Agriculture Undergraduate Student Research Grants Program
LSU AgCenter Functional Foods Pilot Program

Meeting the 2005 Dietary Guidelines for Americans: A "daunting challenge" for food-stamp recipients in Southeast Louisiana

Carol E. O`Neil, Jeffrey Gillespie, Pamela Monroe; Human Ecology

Key Theme: Human Nutrition

The Dietary Guidelines for Americans (DGA) provide nutrition and dietary advice to reduce the risk of chronic disease in healthy Americans. The 2005 DGA recommend high intake of fruit, vegetables, dairy, and whole grains when compared with previous versions. Low-income populations are especially vulnerable since they are at high risk for diet-related chronic disease. To meet the 2005 DGA, major dietary changes will need to occur. The cost and availability of healthy foods, are key issues in determining whether low-income populations can afford to meet the 2005 DGA. It's important to know whether these individuals can purchase these foods with the monetary resources available to them.

In 29 supermarkets and in East Baton Rouge Parish and seven surrounding parishes, the cost and availability of two weekly food lists from the TFP and other commonly consumed foods were determined. Two-week cycle menus were planned to meet the 2005 DGA for a reference family of four. Linear Programming analysis was used to plan a market basket of a cost-minimizing combination of foods that will meet the DGA. Further, it is not known whether the food lists designed to support the Thrifty Food Plan are affordable and available to the FS-reliant population in Southeast Louisiana. Finally, food group intake, energy/nutrient intake, and diet cost were assessed in 64 female FS recipients in Southeast Louisiana. From one 24-hour dietary recall collected at the beginning of the monthly resource cycle (Day 1) and one at the end (Day 2), nutrient intakes and diet costs were able to be analyzed between different time frames. Participants were divided among food security status (food secure or food insecure), weight status (obese or non-obese), and fast food consumption (consumed or did not consume fast food [FF]) groups for all analyses.

The maximum Food Stamp (FS) benefit for a family of four is $471/month, and the average FS benefit for is $326/month. The cost of the 2-week menus was $615.89, $144.89 higher than the maximum, and $289.89 higher than the average FS benefit for a family of four. The cost of the linear programming (LP) marketbasket was $325.50, $145.50 lower than the maximum, and $0.50 lower than the average FS benefit for a family of four. The LP marketbasket had a limited variety of foods that are difficult to organize into menus. The average cost of foods was $117.01for week one and $112.19 for week two. These average costs were 54% and 47% more than the average FS benefits received, respectively. Only 7/29 stores carried all 86 items on the TFP plan. The menu items most frequently missing were pearl barley and garbanzo beans. The average cost of the food lists at stores located in areas with lower median household incomes was $116.36+- 9.93. The average cost at the stores located in areas with higher median household incomes was $113.67+- 12.38. Low-income individuals were least likely to meet recommendations for whole grains, milk, fruit, and vegetables. Low intakes of these groups, in combination with high intakes of refined grains and low-quality meats, as seen among participants, place them at high risk for vitamin/mineral deficiencies. Mean intakes of vitamins/minerals in all groups failed to meet the established Dietary Reference Intakes for fiber; vitamins A and C; folate; potassium; calcium; and iron. The diet of low-income individuals is poor, and the high cost of healthy foods makes it difficult for them to meet the DGA. We are currently working to revise the menus and the LP marketbasket to make them more cost available and culturally acceptable.

Source of Funds

Southern Rural Development Center Grant
HATCH Funds

Wild Woods Wanderings Environmental Education Camp

Michele Abington-Cooper; 4-H Youth Development

Key Theme: Natural Resources Management

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. camp; 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 2006, reaching 44 4-H teens, 3 science teachers, 7 adult volunteers, and 3 4-H Agents. This year a 4-H volunteer from Mississippi attended as a mentor for one of the teams of teens. The camp was held at the Poverty Point State Commemorative Area near Epps, Louisiana, 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 much 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 their “;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.

Beginning in 2004 a new type of evaluation was used for Wild Woods Wanderings. A total of 41 questions identifying terms, practices and concepts related to environmental topics common to the bottomland hardwoods ecosystem were addressed by youth participants. Students were asked to identify prior knowledge and post-knowledge by multiple choice answers. Four (4) possible answers were given for each of the questions tested, and were identical for each of the 41 questions given. Students identified pre- and post-knowledge or understanding by selecting the possible answers listed:

A. Never heard of it B. Know something about it C. Know quite a bit about it D. Knowledge and experience with application

Analysis of the data collected assigned numerical information for the possible answers. Values assigned to the data were as follows:
A = 1 B = 2 C = 3 D = 4
Based on the numerical assignment, data could be analyzed as:

1-2 = Little or no knowledge or understanding of the term, practice or concept
3 = Substantial knowledge or understanding of the term, practice or concept
4 = Knowledge/understanding and experience applying the term, practice or concept

RESULTS:
Answers to the 41 questions in the pre-assessment resulted in a score of 1.726667, less than the 1.873403 for 2004
Answers to the 41 questions in the post-assessment resulted in a score of 3.058965, greater than the 3.029036 average for 2004. The increase toward substantial knowledge or understanding and experience applying the terms, practice or concept for 2006 was 1.85. This is an increase of .22 over the scores for 2004.

The average ranking for all activities during both weeks was 4.05 on a Likert scale of 1-5, with 5 being the highest score. The average ranking for curriculum activities was 4.00. The most popular activities were Night Maneuvers at the Tensas National Wildlife refuge and map and Compass Skills. The Public Policy Activity average ranking was 4.08. In answer to the question, "Would you participate again?"; the reply was 4.47.

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. A private donor contributed $500. The Tensas River Refuge Association provided funds for the food for the camp as well as Advanced Camp.

The LSU AgCenter's Extension Natural Resources Program

Michael Dunn **Ag Economics and Agribusiness**

Key Theme: Natural Resources Management

The most recent data available reveals that forest - related enterprises in Louisiana provide approximately $1 Billion in gross farm income and almost $5 Billion in primary value added to Louisiana' economy. These forest resources are predominantly owned by private landowners and managed by the private sector. In order to achieve, promote and sustain Louisiana' natural resources, the LSU AgCenter's Extension Natural Resources program develops and implements diverse educational programming for natural resource stakeholders.

The Extension Natural Resources Program (ENR) is comprised of four area forestry/wildlife agents and five specialists. As a group, ENR develops and implements a broad spectrum of programs designed to provide clientele such as forest landowners, forestland managers, loggers, arborists, and public sector stakeholder groups with the latest in technical, environmental, policy, and economic information. These programmatic efforts include regional forums, field days, short courses, continuing education for natural resource professionals, publications, and personal

In 2006, ENR developed and implemented approximately 25 unique programs that were delivered to various clientele, including landowners, professional natural resource managers, loggers, arborists, the general public, wood utilizing companies and sole proprietorships, and nature enthusiasts. These programs included formal workshops, regional workshops, regional forums, 4H educational programming, publications, websites, and other individual methods. Over $200,000 in self-generated funds helped pay for these programming efforts, which is equivalent to approximately 39% of the total funding allocating by the state and federal governments for natural resource-related extension programs.

The ENR program directly reached over 20,000 people through public events such as Expos, 4H sponsored events, and direct communications. ENR directly worked with approximately 1,800 clientele through professional, organized educational programs. Program evaluations have shown that, overall, clientele attending our educational programs communications. place a personal value for these programs at approximately $2,250 per individual per workshop, which equates to a net positive impact of $4,050,000, or a benefit multiplier of approximately $8.00 for every $1 appropriated by state and federal government for natural resources extension programming. In addition, for specific programming efforts attendees have reported by as much as 66% that the knowledge received will better assist them in natural resources conservation and management. Evaluations of some programming efforts revealed through surveys that, on a 1 to 5 scale, attendees knowledge increase from 2.7 before to 3.9 after attending.

Source of Funds

Renewable Resources Extension Act (RREA), State, and Federal Appropriations, and Self-generated funds

Louisiana Wildlife News

Don Reed **Renewable Natural Resources**

Key Theme: Wildlife Management

Wildlife plays an important role in the economic and recreational life of Louisiana citizens. Numerous citizens are often seeking information on a wide variety of wildlife topics dealing with everything from nuisance wildlife and wildlife species management to current wildlife news.

To meet this growing need, a bi-monthly publication titled "Louisiana Wildlife News" began distribution in March of 2006 in order to keep clientele abreast of the latest wildlife news in our state, along with covering topics dealing with nuisance wildlife and selected plant and animal wildlife species.

This publication has become an important resource for county agents to increase the wildlife knowledge base of their clientele. Additionally, numerous individuals outside of the AgCenter regularly request to receive electronic copies of the newsletter.

Source of Funds

LSU AgCenter Communications staff organizes the newsletter into a web-based format for state-wide distribution.

Parish Wildlife Field Day

Don Reed **Renewable Natural Resources**

Key Theme: Wildfire Science and Management

Hunters and land managers from Terrebonne Parish were interested in learning numerous things concerning the management of white-tailed deer in their parish. These people wanted this information in order to better manage their hunting lands for private recreational use and income generated hunting leases.

A landowner field day was held in the parish in which a variety of management topics were covered dealing with white-tailed deer.

Seventy-five individuals attended the workshop and based on random interviews following the program, 100 percent of respondents indicated that the program had greatly to moderately increased their knowledge base on the management of white-tailed deer.

Source of Funds

LSU AgCenter

Louisiana Natural Resources Symposium

Todd Shupe **Renewable Natural Resources**

Key Theme: Natural Resources Management

Louisiana is blessed with one of the country's richest and most diverse renewable natural resources. It is important that these resources are utilized in a sustainable manner for future generations.

Therefore, the Louisiana Natural Resources Symposium was held on the campus of LSU in 2006.

Post workshop surveys indicated the program was a tremendous success. A diverse audience of over 100 attendees was educated regarding many aspects of conservation, utilization, and sustainability of our renewable natural resources.

Source of Funds

LSU School of Renewable Natural Resources
Louisiana Cooperative Extension Service
Southern Regional Extension Forester
USDA Forest Service, Southern Research Station
Boise Cascade
Louisiana Forestry Association
Louisiana Society of American Foresters
The Nature Conservancy of Louisiana
Mockler Beverage Budweiser
Louisiana Beer League

Timing, Soil, and Rate Enhance Effectiveness and Sustainability of Fertilizing Loblolly Pine Forests

Michael Blazier **Renewable Natural Resources**

Key Theme: Forest Resource Management

Pine forests of the southeastern United States currently produce nearly 25% of the world's forest products. Timber production is vital to the rural economies of these states; for example, forests of Louisiana constitute its most valuable agricultural crop. This prominence as a timber-producing region is being challenged by the rise of short-rotation timber production in Central and South America as well as the loss of forestland capable of producing forest products via urban sprawl and forest fragmentation. As such, it is vital to increase productivity in forests in which timber production is a primary objective with intensive management practices that promote crop tree growth. Improving soil fertility through fertilization can enhance forest productivity, but it is imperative to understand the soil and stand conditions that optimize fertilizer uptake and use for fertilization to be economically and ecologically viable.

A series of studies were conducted in north and central Louisiana based at the LSU AgCenter Hill Farm Research Station within research project LAB03705 to explore tree growth, tree nutrition, and soil nutrient dynamics as affected by: (1) fertilizer type, (2) fertilizer rate, (3) fertilization timing relative to mid-rotation thinning, and (4) soil Information gained by this research may bolster the success of the forest products industry in the southeastern United States by improving the management skills of forest owners and managers. If fertilizing mid-rotation loblolly pine plantations with N fertilizer, it is important to consider soil texture and timing relative to thinning. Forest demand for N is 2 to 8 times greater post-thinning, so stands will likely respond more fully to N fertilizer applied post-thinning.

However, on soils with sandy texture it may be beneficial to postpone fertilization until at least one year after thinning because in the year after thinning there is a natural increase in soil N on such soils. Currently, most forests are fertilized with N within one year of thinning, so postponing fertilization could improve the ecological and economic effectiveness of fertilization on upland sandy soils common in the Western Gulf. Phosphorus fertilizers can likely be applied to stands irrespective of the timing relative to thinning because phosphorus, unlike nitrogen, remains elevated after fertilization for 10 to 20 years. This gives foresters flexibility in timing of phosphorus fertilization, which may enhance economic return potential. Repeated application with 5 Mg ha-1 of poultry litter up to 5 years (which is 3 to 4 times conventional fertilization frequency) did not lead to nutrient leaching problems on a loblolly pine agroforest on a sandy site highly prone to leaching. However, repeated applications with 10 Mg ha-1 (which is 2 times conventional rates) led to nutrient leaching, which could contaminate groundwater. Thus, litter application rates as high as 10 Mg ha-1 should be avoided on sandy soils. Because agroforests can be repeatedly fertilized with 5 Mg ha-1, increased adoption of this land use type may alleviate phosphorus pollution of watersheds attributable to poultry litter application to conventional pastures in the Western Gulf.

Source of Funds

State, USDA, MeadWestvaco, Weyerhaeuser, International Paper, Forest Capital Partners

Detecting Effects of Forest Regeneration Practices on the Productive Capacity of Pine Plantations

Thomas Dean **Renewable Natural Resources**

Key Theme: Forest Resource Management

The productive capacity of the forests within Louisiana is threatened by several factors. In addition to the multiple croppings timberland in Louisiana has experienced, modern management attempts to produce greater quantities of wood and fiber from timberland to replace a declining forest inventory. According to the last Resource Planning Act (RPA) assessment of forest resources released in 1997, harvests in the south central region of the US exceed net production by a factor 1.1. Removals, which include timberland harvested and timberland removed from the timberland base, exceeded net production by a factor of 1.2 during the same period. Greater expectations from timberland in Louisiana is also expected from the migration of

timber-related activities along the Atlantic seaboard to the west Gulf region because of urban sprawl. The nearly exclusive use of rapidly growing, resource demanding families of loblolly pine on industrial lands may also tax the productive capacity of timberland. By the daily performance of their responsibilities, resource managers and foresters in particular conduct informal experiments of site potential on a daily basis. The outcomes of these decisions are typically summarized into numbers of acres treated by various treatment categories and mean response such as percent survival. While such reporting may be a useful measure of activity and quality, much potentially useful information is just archived and unutilized.
A project was initiated in 2001 to retrieve data archived by the Louisiana Department of Agriculture and Forestry on forest regeneration cost-share projects with private landowners in the state. This data consisted of location, type of site preparation applied, number of trees planted, species planted, and 1-yr survival. A spatial database of these records was created so that the survival and site preparation treatment could be displayed on a map of the state. Existing spatial databases were overlain on these data such as soil association and aerial photography to seek correlations with regeneration success and the physical environment. Included in these data were results from Cooperative Research in Sustainable Silviculture and Soil Productivity to provide some results from replicated field.

State foresters are now able to enter their regeneration data directly into the database system, decreasing the interval between data collection and display on the map of Louisiana. Detailed soil information for the southern parishes has now been included to give foresters ready access to soils information to plan site preparation prescriptions. As a result of analyzing the decisions of prudent forests, a site preparation decision tree has been implemented on the system.

Additional tools have been created to develop a variety of reports and graphics to analyze survival and distribution of site preparation treatments by year and by forest district. By given a spatial element to commonly collected forestry data and relevant geophysical variables, foresters can quickly ascertain the success of various treatments and variation of treatments across the state.

Source of Funds

Biological Control of Common Salvinia an Invasive Aquatic Fern

Seth J. Johnson, Dearl Sanders; **Entomology**

Key Theme: Riparian Management

Non-indigenous weeds invade about 700,000 hectares of wildlife habitat per year in the United States and the annual management costs for non-indigenous aquatic weed species is approximately $100 million. Common salvinia, Salvinia minima Baker is a free flowing aquatic fern which occurs in nature as a sporophyte. Common salvinia is a native of South America and was probably introduced to North America during the late 1920s and early 1930s and Louisiana around 1980. It now infests over 100,000 hectares in Louisiana. Common salvinia can invade relatively calm and slow moving freshwater and multiplies rapidly, covering the surface of water and sometimes the floating mats can be as thick as 20-25 cm. It is considered one of the six most troublesome aquatic weeds in Louisiana. Due to its aggressive growth submerged plants are killed because sunlight does not reach them. Common salvinia also displaces native surface plant species including duckweed (Lemna spp.), which is an important source of food for migrating waterfowl species. Ducks will not land on the surface of water covered with common salvinia which reduces the recreational value of infested areas and negatively impacts the $80 million waterfowl sport in Louisiana. Common salvinia degrades the quality of water and makes it unsuitable for organisms inhabiting it, including fishery resources. Common salvinia mats also impede the movement of boats, making it almost impossible to navigate in heavily infested waters. The use of herbicides to control common salvinia infestations is often an expensive and impractical undertaking.

Cyrtobagous salviniae Calder and Sands is an aquatic weevil native to Brazil, Bolivia and Paraguay which has been used for the biological control of giant salvinia, Salvinia molesta Mitchell, in a number of countries including Australia, Fiji, Ghana, Republic of South Africa, and others. Cyrtobagous salviniae can also survive and complete its life cycle on common salvinia. A population of this weevil was found to be established on common salvinia in Florida in 1960.

The Florida weevil is smaller than the Brazilian weevil and is credited with keeping a check on the spread of common salvinia in that state and its absence in Louisiana and Texas has probably lead to common salvinia becoming a nuisance in these two states.

The LSU AgCenter has initiated a biological control program against common salvinia in Louisiana. A colony of salavinia weevils was established with weevils collected on Lake Talquin in north Florida, an area that should make them environmentally adapted to conditions in south Louisiana. The colony is maintained in LSU AgCenter greenhouses in 150 gallon tanks supplied with field collected common salvinia. Experimental releases have been made at five locations and after establishment and overwintering is confirmed the weevils will be mass produced in ponds and distributed widely in infested areas. Experimental efforts are underway at the LSU AgCenter Aquaculture Research Station to mass produce the weevil in an outside pond supplied with geothermal heated water from a deep well that maintains a water temperature of 75°; - 78°; F. Weevil reproduction is maintained with four hours of supplemental light to simulate summer hours of day-length. Winter production of salvinia weevils in outside ponds has never been done before and will give us a big head start on mass releases planned for the Atchafalaya Basin and other areas in south Louisiana this summer.

Successful biological control of common salvinia will reduce the weed to an occasionnal nuisance weed which is its status in Florida. Control of salvinia will have positive environmental, economic and recreational benefits and it will be achieved without the addition of herbicides to the affected aquatic ecosystems.

Source of Funds

State and LA Department of Wildlife and Fisheries

Mapping Conditions of Coastal Wetland Forest

Richard Keim Renewable Natural Resources

Key Theme: Coastal Wetland Management

Coastal wetland cypress-tupelo forests in Louisiana are degrading because of increased flooding a salt-water intrusion. These problems are largely caused by hydrological modifications to the Mississippi River delta, and pose a threat to coastal security as well as ecological functions. There are several potential restoration and management strategies to improve conditions, but the spatial extent and severity of the degradation is not known because of poor data. There are strong and broadly based desires to develop management and restoration plans for this ecosystem, but plans are severely hampered by lack of information.

We developed new methods to interpret satellite data for the purposes of assessing conditions in cypress-tupelo wetland forests. To do this, we first collected intensive data on vegetation conditions, including species, density, and vigor, from 29 large plots in cypress-tupelo forests in the southern Lake Verret Basin in southern Louisiana. We then compared these characteristics to LANDSAT satellite data to develop maps of conditions. This required developing new statistical methods for simultaneously analyzing multiple satellite images taken in multiple seasons and over the course of several years. The results of the work are twofold: (1) immediate production of maps of the forest condition in the study area; and (2) a new method for analyzing satellite data that can be readily applied to other places for broader mapping. We have produced a map that allow fine-resolution interpretation of coastal forest condition in the southern Lake Verret.

Source of Funds

Louisiana Governor`s Office of Coastal Activities

Effects of marsh terraces on submesed aquatic vegetation, fish, crustaceans, and waterbirds

John A. Nyman; Renewable Natural Resources

Key Theme: Riparian Management

Historically, some wetland loss in coastal Louisiana resulted directly from human activity (for example, conversion to agricultural areas or canals and spoil banks). Today however, most wetland loss proceeds without direct human action via the conversion of wetlands to shallow, open-water habitat. Managers and researchers continually search for better restoration tools. Marsh terracing is a new tool that became common in the early 2000's. Terraces are short ridges of sediment dredged up in marsh ponds at elevations so they will flood at high tide. They have been constructed in Galveston Bay, Texas and in

coastal Louisiana where restoration using freshwater and sediments from the Mississippi and Atchafalaya rivers is not an option (primarily southwest Louisiana). Terraces should perform as expected, but the technique is so new that there has been no way to confirm if they work as intended.

The LSU AgCenter, working with the U.S.G.S., Louisiana Cooperative Fish and Wildlife Research Unit developed research plans and obtained funding to conduct replicated studies of the effects of marsh terraces on submerged aquatic vegetation, fish, crustaceans, and waterbirds. Five different research projects, funded by three governmental agencies and a non-governmental organization were initiated and completed between 2001 and 2006). We found that terraces sometimes increased, and never decreased, the abundance of submerged aquatic vegetation, fish, crustaceans, and waterbirds. We also found that terraces supported different species than natural marsh. Preliminary results of the research were presented at regional and international professional meetings. Five manuscripts have been initiated; one peer-reviewed publication has resulted and others are anticipated.

Resource managers are beginning to receive the information that they need to more accurately predict the effects of a new, popular wetland restoration and mitigation tool. Before collaborative studies were conducted by the LSU AgCenter and the U.S.G.S. Louisiana Cooperative Fish and Wildlife Research Unit, there were no data that could be used to test whether or not marsh terraces performed as expected. Resource managers working with the Coastal Wetland Planning, Protection and Restoration Act Task Force and the Louisiana Sea Grant have invited us to present our findings them so that they can incorporate the findings into their deliberations. The result should be a more efficient allocation of limited restoration funds.

Source of Funds

In addition to being supported by the LSU AgCenter, this study was funded by the Louisiana Department of Wildlife and Fisheries, the U.S. Fish and Wildlife Service, the Coastal Restoration Enhancement through Science and Technology (CREST) program, and the Gulf Coast Joint Venture.

Research Emphasis at the Coastal Area Research Station Since Hurricane Katrina

Richard Parish **Coastal Restoration**

Key Theme: Natural Resources Management

Prior to hurricanes Katrina and Rita, the Coastal Area Research Station was named the Citrus Research Station and was devoted primarily to research on citrus -- mainly Satsuma and navel oranges -- with some limited work on commercial vegetables, other fruit and termites. The station was almost completely destroyed by the hurricanes. Most of the buildings were destroyed and the rest were heavily damaged. Most of the citrus trees died due to the flooding and residual salt. Approximately 75% of the citrus trees were removed within a few months of the storm, and many more are dying. The primary activity at the station now is rebuilding the infrastructure so productive research can once again be conducted.

The primary research area currently envisioned for the Coastal Area Research Station is development and evaluation of salt-tolerant coastal plants. These plants have been demonstrated to be capable of growing in brackish water and are quite effective at stabilizing eroding shorelines and marsh areas. Although coastal stabilization has long been recognized as important to Louisiana, the 2005 hurricanes revived interest in and support for research on coastal plants. The LSU AgCenter has been working in this field for many years at other sites, but the Coastal Area Research Station is an excellent site for expansion of this work. The ground is low (elevation of about 1.0-1.5 feet above sea level), the soil has high salt content and water from the Mississippi River is readily available. Plans are being completed for a series of ponds, elevated artificial sand dunes and a can yard to support expanded work in coastal plants.

Research on Formosan subterranean termites was underway at the Coastal Area Research Station before the 2005 hurricanes and has been expanded since. This station provides an excellent site for this research since the station was already infested with Formosan termites and is very isolated. Several projects on Formosan termites are currently underway at the station under the direction of project leaders from the Department of Entomology.

Citrus research will continue at the Coastal Area Research Station but on a smaller scale. The first project proposed for reactivation is a study of subsurface drainage to reduce the water table and reduce the salt content in the soil under rows of

citrus trees. Prior work in this area is very promising. The drainage work will likely be complemented by flushing/leaching with either fresh water or river water.

The station will also continue to support research projects initiated by other faculty from the LSU AgCenter. Current examples include soybean sentinel plots to detect Asian soybean rust and a trial of ornamental sweet potatoes.

The specific emphasis of the Coastal Area Research Station may be changing, but the goal of providing useful research information to the people of Louisiana and specifically to Plaquemines Parish and other coastal areas remains the same. The new emphasis on coastal plants will help all of the coastal parishes of Louisiana.

Source of Funds

LSU AgCenter, Louisiana Office of Risk Management, and FEMA

The Atchafalaya River Basin: An Ecosystem in Peril

Allen Rutherford **Renewable Natural Resources**

Key Theme: Wetlands Restoration and Protection

Seasonal overbank flooding of the Atchafalaya River in Louisiana forms the Atchafalaya River Basin, which is North America's largest bottomland hardwood swamp. The Basin is used by commercial and recreational hunters and fishers, as well as for many non-consumptive activities (e.g., boating, canoeing, kayaking, bird watching, eco-tourism, etc.). The total economic impact of commercial finfish and crawfish the in the Basin has been conservatively estimated to exceeded 72 million dollars, with the economic impact of recreational hunting and fishing exceeding 265 million dollars. The estimated economic impact of bird watching and other non-consumptive activities in the Basin currently exceeds 40 million dollars. In addition, the Basin has served as a source of income for local fishermen and trappers since the 1700s. Even though the seasonally flooded habitats of the Basin are sparsely populated, a unique and thriving ";Cajun"; culture has arisen in more developed areas adjacent to the area.

Natural processes accelerated by human activities, such as levee construction, poorly planned water management activities, and exotic plant introductions have contributed to water quality problems in the Basin. In addition, sediment input from the Atchafalaya River to these backwater areas has hastened the natural succession of this economically and culturally important aquatic ecosystem. Low dissolved oxygen levels that occur seasonally in the Basin have been shown to be more widespread and remain lower, longer than historic values.

Because these activities are reducing the extent and quality of aquatic habitats in the Basin, and can dramatically impact fish and crawfish populations, we have conducted studies to examine the impacts of water quality on the biotic community. We have also developed a long-term fish and water quality monitoring program to aid in the assessment of state and federal management activities designed to restore historic conditions in the Basin floodplain. The information from studies on relationships between water quality and biota will ultimately benefit all (e.g., natural resources managers, recreational and commercial activities, eco-tourism) that have historically utilized the enormous natural resources found there.

Source of Funds

U.S. Army Corps of Engineers
U.S. Geological Survey
U.S Fish and Wildlife Service
Louisiana Department of Natural Resources

Metribuzin and Atrazine Retention Adsorption By Sugarcane Residue

H. M. Selim **Agronomy & Environmental Management**

Key Theme: Herbicide Assessment in Soils

The influence of crop residue on the fate and efficacy of applied herbicides in soils is one primary focus associated with conservation measures in today's agriculture. We are not aware of published research that correlates the effectiveness of residue remaining on the soil surface, following sugarcane (Saccharum Spp. Hyb.) harvest, on the retention of applied herbicides and their movement in the soil. In this study, we quantified the retention of two commonly used herbicides namely, atrazine and metribuzin, by the sugarcane residue in an effort to characterize their behavior in soils. Changes in the characteristics of herbicide retention as a function of the age of the residue while decaying in the field were also investigated. Such information is a prerequisite for quantifying the role of the residue in minimizing leaching losses of applied chemicals in soils.

The objective of this study was to quantify the retention of atrazine and metribuzin in soils when sugarcane residue was present. Adsorption experiments were performed to quantify atrazine retention by the sugarcane residue as a function of time. Atrazine retention was consistently stronger than metribuzin and was well described using a linear model. A partitioning coefficient (Kd) for herbicide retention increased with reaction time from 18.77 to 25.46 mL/g after 1 and 21 day, for atrazine, and 10.58 to 14.20 mL/g for metribuzin. Moreover, atrazine retention did not change significantly with the age of the decaying residue over three growing seasons. Consequently a single retention parameter is necessary to describe atrazine or metribuzin retention regardless of when herbicide application is made. Based on four growing seasons (1999-2003), the amount of crop residue remaining on the soil surface following harvest ranged from 3 to 7 tons/ha. Based on first-order decay, the rate of residue decay on the soil surface ranged

Atrazine and metribuzin retention by the sugarcane residue exhibited strong kinetic behavior as indicated by increased retention with time. Strong retention is beneficial in minimizing potential runoff losses and downward movement in the soil. Moreover, atrazine and metribuzin retention did not change significantly with the age of decaying residue. We conclude that for each herbicide, atrazine and metribuzin, one retention parameter is needed to quantify retention behavior regardless when the herbicide is applied.

Source of Funds

State, Hatch, and Multi-State

Colloid Mobilization and Arsenic Transport in Selected Louisiana soils

H. M. Selim **Agronomy & Environmental Management**

Key Theme: Soil Quality

Arsenic (As) is a toxic element and is almost always present in soil, water, plants, and aquatic systems. High concentrations of arsenic can be introduced in soils and wetlands through industrial waste disposal, mining activities as well as insecticide applications. Elevated As concentration is a public health issue with the potential to impact wetlands, aquatic environments and the surrounding soils. Thus, understanding of the complex interactions of arsenic in the environment is a prerequisite in the effort to predict their behavior in the vadose zone. A wide range of interactions including ion exchange, surface complexation, and precipitation contribute to the removal of arsenic from aquatic solution by solid constituents. In general, adsorption to soil and sediment is the major pathway of attenuating arsenic bioavailability and toxicity in natural environments. Traditionally, the transport of arsenic is assumed to occur entirely in aqueous or soluble phase. However, significant portion of mobile arsenic in the groundwater is present in colloidal form, i.e., arsenic minerals or adsorbed on mineral surfaces. The potential of colloids mobilized from soils or sediments in facilitating the transport of strongly sorbed contaminants have been studied by several researchers. Iron oxides have long been recognized as important soil constituents affecting the retention and transport of inorganic arsenic [As(V) and As(III)] in soils. If colloidal iron oxides with adsorbed arsenic were mobilized in the soil system, it may cause colloidal facilitated transport of arsenic. Colloid generation and transport in soils is of great concern because of the suspected colloid-facilitated transport of contaminants to groundwater. In

this study was investigated the relationships between the mobilization of colloidal Fe oxides and transport of As(III) in soils with different properties. Specifically, we conducted sorption/mobilization column experiments to assess the potential for rapid mobilization of arsenic from soils by the release of colloids upon reducing ionic strength of the influent.

Research was conducted to quantify colloid mobilization and its effect on the transport of arsenite [As(III)] in Olivier and Windsor soil columns. Input solution of 10 mg L-1 As(III) in 0.01 M NaCl was first applied to saturated columns, followed by leaching with deionized water (DIW). Turbidity, electrical conductivity (EC), and pH of column effluents were monitored. Total and dissolved concentration of As, Fe, and Al were analyzed. Mobilization of colloidal amorphous material and enhanced transport of As(III) was observed when the input solution was replaced with DIW. The peak of colloid generation coincided with peak concentrations of Fe, indicating mobilization of Fe oxides and facilitated transport of As(III) adsorbed on oxide surfaces. Mobilization of colloidal particles was observed due to flow interruption in Olivier column which suggests the kinetically controlled colloid generation. Moreover, our results indicate significant effect of organic matter in stabilizing aggregates of colloidal particles.

Changes in chemical composition of solutions in aquifer and vadose zones may result in colloid facilitated transport of contaminants such as As in soils. For example, landfill leachate often contains high concentrations of heavy metals with high ionic strength. Displacement by rainfall or irrigation water which typically has low ionic strength could result in mobilization of arsenic associated with colloidal particles and potential contamination of surface or groundwater. Another possible case is the freshwater intrusion to a contaminated coastal aquifer, which is often saturated with saltwater. Moreover, the extent of colloid generation and its effect on contaminant transport is heavily relied on the chemical and mineralogical composition of the geological materials.

Source of Funds

State, Hatch, and Multi-State

Managing Rare Species and Habitat and Advanced Best Management Practices

Charles L. Shilling **Renewable Natural Resources**

Key Theme: Forest Resource Management

Master Logger certification is required of all logging contractors supplying timber to manufacturers who have met the standards of AF&PA's Sustainable Forestry Initiative (SFI). SFI loggers must complete training in OSHA safety requirements, environmental concerns, selected forestry practices and improved business management techniques to become certified Master Loggers. To maintain certification, loggers must annually complete 6 hours of Continuing Logger Education (CLE) in one of those areas. Foresters earn Continuing Forestry Education (CFE) credits as approved by Society of American Foresters.

A 6-hour workshop, entitled Managing Rare Species and Habitat and Advanced BMPs, was held in 6 locations throughout Louisiana in 2006. 250 foresters and loggers attended. The workshops consisted of PowerPoint presentations, demonstration of on-line information available through the Louisiana Department of Wildlife and Fisheries (LDWF) and each participant was given 8 pieces of literature. In addition to LDWF personnel, foresters from Plum Creek, Temple-Inland, International Paper Company, and SFI staff of Louisiana Forestry Association (LFA) contributed to the workshops.
250 individuals maintained certification in the Louisiana Master Logger Program by earning either CLE or CFE credits in the workshops.

Source of Funds

Renewable Resources Extension Act (RREA), State Extension funds, and workshop registration fees. Printed materials furnished by the LFA.

Prescribed Burn Manager Certification

Charles L. Shilling **Renewable Natural Resources**

Key Theme: Forest Resource Management

Liability associated with managing smoke from prescribed burns conducted in forest settings may be reduced if prescribed burn managers meet certification standards; workshops are a part of the certification process.

Two Prescribed Burn Manager Certification Workshops were held in July 2006; one at LSU, Baton Rouge, LA and one at La Tech, Ruston, LA. The format of the workshops was PowerPoint presentations and each participant received four pieces of literature.

43 (100%) professional land managers and landowners passed the Prescribed Burn Manager certification exam administered at the end of the workshops.

Source of Funds

Renewable Resources Extension Act (RREA), State Extension funds; services and materials furnished by Louisiana Department of Agriculture and Forestry.

Managing Non-game Birds

Charles L. Shilling, Donald P. Reed; **Renewable Natural Resources**

Key Theme: Wildlife Management

Game birds are the primary species for which land is managed in Louisiana. But, there is a significant number of citizens whose major past time is bird watching and/or managing backyards or small woodlots for non-game birds. Many urban and suburban homeowners need information about how to manage for non-game birds.

A workshop was conducted on the LSU campus in May 2006; 29 people attended. In the morning session PowerPoint presentations were made concerning travel patterns of neo-tropical migrants, preferred flowering and fruiting plants for non-game birds, and planting and landscape designs favorable to non-game birds. The afternoon session centered around tours of selected backyards and small woodlots that were noted for attracting non-game birds. Five pieces of literature was made available to each participant.

Participants indicated that they learned from both the PowerPoint presentations and the field tours, and that the knowledge they learned would aid in improving their non-game bird habitats.

Source of Funds

Renewable Resources Extension Act (RREA), State Extension Funds, and workshop fees.

Application of Microsoft Excel in Forestry

Charles L. Shilling, Quang V. Cao; **Renewable Natural Resources**

Key Theme: Forest Resource Management

Continuing education in computer technology and software is essential for consulting foresters to maximize on their time and service to clients.

A workshop was developed to review the basics of Microsoft Excel and then expound on the specific application of the software in forestry. The workshop was offered two times on the LSU Campus in July 2006. Participants were shown

PowerPoint presentations, had hands-on sessions in a computer lab, and were given notes and take-home exercises and examples for future references.

15 consulting foresters indicated that they learned new techniques and approaches in the use of Excel, and that the workshops would make them more effective in their work.

Source of Funds

Renewable Resources Extension Act (RREA), State Extension funds and workshop fees.

Louisiana Ecosystems and Plant Identification: An Interactive Virtual Tour

Michael Stine, Mary S. Bowen; Renewable Natural Resources

Key Theme: Plant Identification

There is a significant demand for help with the identification of plants. One of the challenges in delivering this information online is presenting enough detail to separate similar species while at the same time showing how plants fit into their environment. This results in needing to show close-up images of individual plants, and wide angle images of entire areas, along with text to explain what the website user is viewing.

We have been developing a website called Louisiana Ecosystems and Plant Identification: An Interactive Virtual Tour (http://rnrstreamer.lsu.edu/ecosystems/webtour/enter.htm) that provides all of this information. The user can navigate through different ecosystems as if they are standing in the middle of the image and look around in all directions. The user can see which species occur in that ecosystem and then go to other pages where detailed images are available. We currently have 48 sites categorized by habitat type, and links to 240 individual species.

Our website has had over 8000 users, and monthly usage has doubled in the past year. In addition to use of images online, a series of posters showing leaves, flowers, fruit, etc. has been developed in order to further the distribution of this information. A total of 3000 sets posters were printed for use by science teachers and for use at workshops.

Source of Funds

Louisiana Department of Agriculture and Forestry

Identification of Important Habitat for Migrating Birds in the Maurepas Swamp

Philip C. Stouffer Renewable Natural Resources

Key Theme: Wildlife Ecology & Management

Hundreds of millions of birds of over 100 species migrate over the Gulf of Mexico each year. This includes the entire population of many species that breed in eastern North America. Before crossing the Gulf in the fall, and after crossing in the spring, these birds require appropriate habitat for refueling. For forest species, such as warblers, tanagers, and thrushes, forested stopover habitat is especially critical for successful migration. The wetlands surrounding Lake Maurepas include some of the largest stands of bald cypress/tupelo forest in the state. Unfortunately, most of this forest is degraded, and some has turned to open marsh due to forces such as saltwater intrusion, subsidence, and nutria herbivory. Our objective was to determine the extent of use of the swamp by migrating birds. How will birds respond if additional swamp forest becomes degraded, or opens up to treeless marsh?

We used weather radar to determine when and where migrating birds occur in the Maurepas Swamp. Birds appear on radar, and can easily be distinguished from rain by their abrupt appearance just after dusk. Most forest-breeding species will forage during the day, then fly up to >1000 ft just after dusk to resume migration. From their radar signals, we could determine the number of birds and where they spent the preceding day. We then matched up these bird locations with a habitat map constructed by Dr. Gary Shaffer at Southeastern Louisiana University. We found that birds migrating in the spring were

most associated with the forests south of Lake Maurepas, and avoided open marsh. In the fall, birds preferred more intact forest, especially to the northeast of Lake Maurepas. At a broader geographic scale, we always found more birds in the heavily-forested Pearl River basin than in the Maurepas Swamp.

Everyone in Louisiana has become familiar with both the plight of our wetland systems and their important economic and ecological roles. The forested wetlands surrounding Lake Maurepas are currently being lost.

Source of Funds

US Environmental Protection Agency

Weed Control Program Options in Louisiana

Paul R. Vidrine, Derek Scroggs; Agronomy & Weed Science

Key Theme: Crop Protection & Environmental Management

The soils in the Red River Valley of Louisiana are unique in that they have high pH values ranging from 7.5 to 8.1. This type of soil characteristic presents challenging opportunities to weed scientists and producers, especially when considering the use of preemergence herbicides. Under these circumstances weed control programs rely heavily on postemergence herbicides. Also, herbicides may persist longer in high pH soils and may extend into the following season, creating crop rotation problems for growers.

Research related to weed management in row crops has addressed crop response and weed control comparing traditional herbicides to the new transgenic technologies, which consists of crop varieties and hybrids genetically altered to tolerate applications of non selective herbicides. Results indicate that both systems of weed control are effective with crop safety and it is the producer's decision to select a program based on each individual needs. However, utilizing the transgenic technologies of tolerant/resistant varieties allows growers with high pH soils access to weed control programs that have no soil carryover problems in rotational crops the following year.

Modern weed control research is conducted to evaluate and compare traditional herbicide systems with new transgenic variety systems for crop safety and weed efficacy. From these systems producers can determine which system of weed control program best suits their farming enterprise. The evaluation of traditional and new technologies focuses on utilizing precise herbicide applications while realizing the need to address specific species shifts and herbicide resistant weeds. Programs that are offered to growers are aimed at the most efficient manner of weed removal, while costing the least, and limiting the amount of pesticides released in the environment thereby benefiting not only the producer but the general population as well.

Source of Funds

State and Agrichemical Companies.

Rice Weed Control Research in Northeast Louisiana

Bill Williams, Ann Burns, Eric Webster, Mike Stout, Kelly Tindall, Rakesh Godara; Agronomy & Weed Science

Key Theme: Crop Protection & Environmental Management

Rice is an important commodity that in the last five years has contributed as much 250 million dollars annually to Louisiana's economy. The value of weed control in rice often goes unnoticed due to effective management programs. However, if left unmanaged weeds are undeniably among the most important factors limiting rice production. For example, red rice and barnyardgrass can reduce yields by as much as 60%. Furthermore, weeds like red rice also reduced quality thereby lowering the value of harvested grain. Weeds are constantly evolving and adapting to management strategies. Without new technology and/or changes in management strategies weeds soon overcome and overwhelm existing management programs. As a result, the development of new technologies and management strategies for weeds in rice are high priorities at the Northeast

Research Station.

Rice weed control research at the Northeast Research Station focuses on the development of integrated weed management systems that incorporate new and current technologies that are the most economically and ecologically sound options available to the rice producers. This research is designed to evaluate weed management programs for the major seeding and tillage methods used by producers.

Research at the Northeast Research Station develops the information needed to make informed decisions concerning new technologies, crop rotations, and the most cost effective and environmentally friendly programs for controlling weeds in rice. It is estimated that the development of new weed management technologies in rice has increased net returns of up to $114 per acre in the last five years. Much of this is due to more economical programs, improved weed control, and improved yields. The development of improved weed management technology also benefits the environment. Many of the new herbicides target enzyme systems that only exist in plants, making them extremely safe to mammals and invertebrates. Improved programs for managing cool-season weeds, and in the case of Clearfield rice for managing red rice, has allowed the development of reduced tillage systems resulting in less sediment and herbicide runoff from rice fields.

Source of Funds

Rice Research Board, State, Hatch, USDA-SARE, commercial grants

Character Development School Model Helps Schools Fulfill School-wide Positive Behavior Support and Character Education Mandates

John W. Arceneaux **4-H Youth Development**

Key Theme: Character/Ethics Education

The Louisiana Department of Education established school requirements for school-wide positive behavior support (SWPBS) and character education as methodologies for improving student behavior and academic success. Schools faced with determining how to integrate these worthwhile initiatives, so they do not take away from but enhance instructional time, requested from Louisiana 4-H a research-based school model which combines both initiatives and could be implemented in phases.

Research has demonstrated that at every developmental level - elementary, middle school, and high school - students who experienced quality character education programs outperformed comparison groups on measures of social behavior and academic learning. This finding, published in the fall 2003 issue of the Journal of Research in Character Education, resulted from a comprehensive literature review by Jack Benninga and colleagues on the relationship between academic performance and high-quality character education.
The Louisiana 4-H character development program school model was developed as a resource for schools to comply with these mandates. The model incorporates the components of both SWPBS and character education into a positive youth development system that creates a caring school community. One that meets youth needs - belonging, mastery, independence and generosity - and enhances academic success.

The model is structured on the character education guidelines, character virtues and desired academic and behavioral outcomes identified by The What Works Clearinghouse of the U.S. Department of Education and Louisiana Department of Education. The Eleven Principles of Effective Character Education, of the Character Education Partnership, provide the methodology guidelines and the Six Pillars of Character, of CHARACTER COUNTS!, are the character framework.

The Eight Essential Elements of 4-H Youth Development - a positive relationship with a caring adult, a safe environment, an inclusive environment, engagement in learning, opportunity for mastery, opportunity to see oneself as an active participant in the future, opportunity for self-determination and opportunity to value and practice service to others - meet the belonging, mastery, independence and generosity needs of students. SWPBS Tier 1 student needs are met through school-wide positive behavior and character development support and the developmental needs of the Tier 2 and 3 youth are met through individual development plans.

Caddo Parish school personnel provided guidance in the development of the school model and representatives from each elementary, middle and high school were trained on the school model in September, 2006. The representatives brought the information to their SWPBS school leadership teams and began the process of implementing the practices and components of the model. School-model pilot projects will be implemented in two Caddo Parish elementary schools in the 2007-08 school year. These projects will include control groups and evaluations will be performed. The pilot schools will serve as models for other schools within Caddo Parish and throughout the state.

A parish youth development coalition is being formed in Red River Parish and will focus on character development parish-wide. A community volunteer is leading the initiative and is forming a task force to move forward with the development of the coalition and formation of a 501.C3 non-profit organization. Supporting character development in the public and private schools will be a goal of the coalition. In February, 2007, a community volunteer will begin providing character development training, once a month, to each grade of the parish's junior high school. This is the third component of the school model to be implemented in the school. The coalition will serve as a character development community involvement model for others.

The school model enables standardization of recommended practices and will be provided throughout the state to schools on a component and complete school model basis. Schools currently having some of the components in place will be encouraged to phase in the complete model. Schools will become character development partners with Louisiana 4-H, share their success stories and serve as mentors for others.

Source of Funds

The Louisiana state legislature appropriated $300,000, for the 2006-07 physical year for the LSU AgCenter to provide character education services throughout Louisiana.

The Louisiana Center for Rural Initiatives: Strengthening Research and Extension Efforts to Improve Community Development in Rural Louisiana

James N. Barnes, Dora Ann Hatch, Cynthia Pilcher, Kay Lynn Tettleton; Ag Economics and Agribusiness

Key Theme: Community Development

Rural Louisiana continues to face significant challenges to improve local economies. For example, one out of every four people in rural Louisiana lives below poverty and roughly three quarters of rural parishes have been defined as persistent poverty counties and education completion rates in rural areas lag those in urban.

Despite these serious challenges, we know surprisingly little about the socioeconomic conditions and trends in rural areas of Louisiana. In addition, we have limited stakeholder input from rural residents regarding rural development research and extension strategies to improve community rural development.

The Louisiana Center for Rural Initiatives (LCRI) was created to understand more about the socioeconomic conditions and trends in rural areas of Louisiana as well as gather rural stakeholder input. LCRI is an interdisciplinary team of social scientists and policy professionals engaged in research and extension programs that contribute to sustainable community and rural development in Louisiana. LCRI, as created by Act 796 of the Louisiana Legislature, is a consortium initiative between the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Research and Extension Center (SU Agricultural Center). LCRI is housed in the Department of Agricultural Economics and Agribusiness at LSU and operates a satellite center, the Delta Rural Development Center, in Oak Grove, La.

On September 6, 2006, the LSU AgCenter's Delta Rural Development Center took one of its first steps to gather rural stakeholder input to better develop and deliver rural development research and extension programming. LCRI and the Delta Rural Development Center received a small grant to conduct a workshop with rural residents to assess their perspective of current research and extension needs to improve community rural development. Almost 50 people (of the more than 400 people invited) from public and private organizations as well as rural residents participated in the workshop on September 6, 2006.

The structure for conducting the workshop was provided by the Southern Rural Development Center at Mississippi State University. James Barnes, Director of the Delta Rural Development Center, along with LSU Agricultural Center community rural development agents, Cynthia Pilcher, Kay Tettleton and Dora Ann Hatch facilitated the workshop at Calhoun and Winnsboro in Northern Louisiana using distance education technology. Participants were asked to identify the top three areas of future work to strengthen community development in rural Louisiana. The top three priorities included:

Education and workforce development - rural communities struggle to: (a) assess workforce skills needed and the role of economic incentives (salaries, taxes) to improve recruitment of businesses; (b) develop of a rural entrepreneurship educational strategy; (c) access community and technical college classes; and (d) provide enhanced educational opportunities for youth and redesign of high school learning.

Economic development (agriculture and non-agriculture) - lack of entrepreneurial environment, limited access to high-speed internet, poorly trained workforce, drug usage and a reduced farming sector continue to limit development of rural communities in Louisiana.

Natural resource and environmental management - rural Louisiana would benefit by (a) improving solid waste management strategies; (b) strengthen water distribution infrastructure and enhance water quality; (c) expanding access to public areas for recreational use; and (d) adopting more conservative land uses to preserve natural resources and reduce pollution.

Gathering of rural stakeholder input provides three fundamental impacts aimed at improving community rural development in Louisiana. First, rural stakeholder input provides a set of suggested priorities for rural development research and extension programming which means our work within LCRI and the Delta Rural Development Center becomes increasingly more relevant, timely and focused on the most important community development needs in rural Louisiana. Currently, LCRI, the Delta Rural Development Center and community rural development agents are developing new and adjusting existing extension programming to focus more on rural entrepreneurship, value-added agricultural enterprise development, leadership and rural tourism. Secondly, LCRI and the Delta Rural Development Center can now adjust human and other resources to build a more effective research-extension programming infrastructure to meet these rural development priorities. Thirdly, LCRI and the Delta Rural Development Center will be able to leverage resources more effectively when collaborating with other institutions within Louisiana, such as the Southern Agricultural Center, as well as other institutions of higher education in the South. The same type of workshop was also conducted throughout the states in the South during 2006. The top priorities for rural development research and extension programming across the South can now be identified in a systemic way based on rural stakeholder input. This means LCRI and the Delta Rural Development Center can identify other states with similar priorities and develop projects which address community rural development needs using fewer resources.

Source of Funds

Kellogg Foundation
Southern Rural Development Center
LSU Agricultural Center
Department of Agricultural Economics & Agribusiness

The Louisiana Center for Rural Initiatives: Improving Health Care Delivery to Promote Economic Growth in Rural Louisiana

James N. Barnes, Dr. Matthew Fannin; Ag Economics and Agribusiness

Key Theme: Human Health

While Louisiana is facing a health care delivery crisis in the New Orleans metropolitan area since Hurricane Katrina, rural areas in Louisiana have faced a long-term challenge of attracting health care professionals. Rural parishes face a disproportionate share of health care professional shortage areas in primary care, dental care, and mental health (Department of Health and Hospitals 2006). Further, rural parishes have the highest death rates from heart disease and stroke as well as the highest infant mortality rates in the state. The remoteness of these rural parishes makes it difficult for their residents to access the primary and preventative care necessary for the average person to maintain quality health. The health status of residents can have a major impact on economic growth similar to educational attainment (Bloom, Canning, and Sevilla 2004). A healthy workforce misses fewer work days and labor is more productive during work hours. This potential impact is even greater in rural economies of Louisiana that are more dependent on occupations that require greater physical activity such as those parishes dependent on the food and fiber system (Fannin and Henderson 2005).

Research to date on attracting physicians to rural areas has shown that physicians who are most likely to practice medicine in rural areas are those physicians who were originally raised in rural areas or who participated in a rural residency program (Rabinowitz et al. 1999). Yet, programs that have attempted to attract rural students into medicine or place medical students in rural settings have failed to reduce the health care professional shortage given an increasing demand for these individuals. More research is needed to identify additional characteristics that may increase the health care professional supply in rural Louisiana, and through increased health status of citizens, increased economic growth for the state.

The Louisiana Center for Rural Initiatives (LCRI) was created to understand more about the socioeconomic conditions and trends about rural economies in Louisiana, including its health care sector. The LCRI is an interdisciplinary team of social scientists and policy professionals engaged in research and extension programs that contribute to sustainable community and rural development in Louisiana. The LCRI, as created by Act 796 of the 2004 Louisiana Legislature, is a consortium

initiative between the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Research and Extension Center (SU Agricultural Center). The LCRI is housed in the Department of Agricultural Economics and Agribusiness at LSU and operates a satellite center, the Delta Rural Development Center, in Oak Grove, LA.

Using data from the American Hospital Association, we reviewed the alternative types of contractual arrangements used when recruiting physicians to rural areas in the U.S. We developed econometric models to understand the economic incentive tradeoffs to understand why a rural hospital used one arrangement over others. Our findings were published in two journals, The Journal of Rural Health and the Southern Business and Economic Journal. In both articles, we identified several contracting practices rural hospitals have used to recruit physicians, especially those in Louisiana, Mississippi and Arkansas. The first impact of our work was the acquisition of a $100,000 grant from Louisiana Economic Development. The grant funds will be used to recruit a Ph.D. student to further investigate the economics of physician recruitment and other aspects of health and economic development issues in rural Louisiana.

Secondly, the research conducted will lead to the development of extension based products that can be used by rural provider organizations to identify whether their contract incentives with health care professionals are optimally aligned. This research will also improve future recruitment of health care professionals to rural areas by identifying an existing accepted taxonomy of contractual terms between providers and health care professionals. Identification of these terms will lead to development of best contracting practices.

Thirdly, this research will be able to evaluate provider organizations that adopt “;best contract practices”; based upon the research and evaluate how they impact both health care costs and quality of health care outcomes of patients in rural areas. More directly, this research over the long term would evaluate how increases in health status at the overall parish level increase major economic development variables such as per capita income growth, employment growth, and population growth

Source of Funds

LSU Department of Agricultural Economics & Agribusiness
LSU Agricultural Center

The Louisiana Center for Rural Initiatives Launches Board Training Program to Strengthen Community Entrepreneurship Efforts in Rural Communities

James N. Barnes, Dora Ann Hatch; **Ag Economics and Agribusiness**

Key Theme: Promoting Business Programs

New business formation has been identified as one of the most important entrepreneurship activities necessary to spur economic growth of economies in the 21st Century, urban and rural alike (Kauffman Foundation, 2006). Given the high rates of unemployment in rural Louisiana, spurring entrepreneurship activities of various types seems to be a viable rural economic development strategy.

However, spurring entrepreneurship activities can be accomplished using many different yet complementary strategies for rural economic development. The most obvious is to provide entrepreneurs in rural communities with access to networks, information, resources and institutions to reduce their costs of establishing new businesses. Another strategy could also be to focus improving community entrepreneurship by encouraging better coordination of local resources within a given community to enable the development of infrastructure assets that could be accessed by local entrepreneurs. For example, a chamber of commerce might provide access to internet and other technological infrastructure assets to encourage expansion of downtown businesses into e-markets, such as using eBay to buy supplies or sell products.

But there is a fundamental problem when encouraging community entrepreneurship: often community leaders may not agree on how to develop infrastructure assets to improve the coordination of local resources and do not have access to a method that can help form consensus. And because community organizations such as chambers of commerce are governed by a board of local residents, the problem becomes more about how board members can effectively work with each other to encourage this type of community entrepreneurship. If board members cannot learn to work with each other, the entire process of

encouraging community entrepreneurship can be stymied. Hence, it seems reasonable that one approach to encourage community entrepreneurship is to provide board members in rural communities with the tools to learn how to manage their resources more effectively to encourage community entrepreneurship while building trust among members and improving accountability.

The Louisiana Center for Rural Initiatives (LCRI) was created to understand more about the socioeconomic conditions and trends about rural economies in Louisiana, including how to spur community entrepreneurship activities. The LCRI is an interdisciplinary team of social scientists and policy professionals engaged in research and extension programs that contribute to sustainable community and rural development in Louisiana. The LCRI, as created by Act 796 of the 2004 Louisiana Legislature, is a consortium initiative between the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Research and Extension Center (SU Agricultural Center). The LCRI is housed in the Department of Agricultural Economics and Agribusiness at LSU and operates a satellite center, the Delta Rural Development Center, in Oak Grove, LA.

In 2005, the LCRI through its Delta Rural Development Center began piloting a program called “;Healthy Boards (HB).”; The HB program teaches board members how to work with each other to build trust and strengthen accountability. Dr. James Barnes created the program and refined it to be relevant for a variety of community organizations, such as agricultural organizations, health care providers and chambers of commerce. The program teaches several research based principles that can be used to strengthen the governance and improve coordination of local resources to encourage community entrepreneurship.

In 2006, two steps were taken to launch the program. First, the research based principles used to teach effective board governance were developed and later published in two articles in the Journal of Extension. Next, the marketing brochures and curriculum were completed to offer the program to rural community organizations.

During 2006 and with the assistance of LSU Agricultural Center community rural development agents Dora Ann Hatch and Cynthia Pilcher, the program was delivered to more than 70 people working in chambers of commerce (at Vidalia, Oak Grove, Lake Providence, Bastrop and Jackson), an agricultural organization, Heifer International, which had participants from Mississippi, Louisiana and Arkansas, as well as a health care organization, the Emergency Nurses Association. The core of the HB program can be viewed at http://www.lsuagcenter.com/drdc by clicking on the subtopic rural governance and leadership.

The fundamental impact of the program was to build trust among board members in agricultural and non-agricultural organizations to encourage community entrepreneurship. Results from post program surveys indicated more than 87 percent of all participants stated that after taking the program trust increased among their respective board members. More than 95 percent of participants agreed they would recommend the program to other types of boards operating in rural communities.

Source of Funds

LSU Department of Agricultural Economics and Agribusiness
LSU Agricultural Center

Continuing Education for Louisiana Arborists

Hallie Dozier **Renewable Natural Resources**

Key Theme: Urban Gardening

Hazards associated with arboriculture mean almost prohibitively business operating costs, including insurance costs, equipment maintenance and high worker turnover. Louisiana it is the only state license program that includes a continuing education component, this requirement designed to improve safety and professionalism among arborists and to reduce accidents among arborists and others.

Most Louisiana licensees own their business and employ 2-3 workers. By law, only one licensee is required to be on the work site or nearby, so the 500 or so state licenses represent some 1,000-1,500 additional tree workers, who are not required to participate in the continuing education, and thus may not benefit from the materials presented therein.

After the hurricanes of 2005, hundreds of unlicensed, out of state operators were allowed to do emergency work (e.g., removal of downed trees), though guidelines were not strictly enforced. Unlicensed crews effectively out-competed local workers for jobs, leading to higher than normal license and worker turnover. Additionally, the urgency of the situation, poor coordination and influx of unlicensed, poorly trained workers resulted in poor quality work in many sectors.

The continuing education program emphasized training on safety and professionalism and added programming LSU AgCenter followed these steps to provide quality educational programs for Louisiana arborists: 1) reviewed broad program goals (enhance safety and professionalism among arborists); 2) identified training topics and suitable training experts; and 3) implemented seven training sessions across the state involving 518 participants designed to improve business operations: client and worker retention.

Program participation is not an indicator of impact because participation is required for all licensed arborists. Workshop evaluation forms completed by participants at the close of each event indicate that participants find the

Source of Funds

Funding for this program came from registration fees for the sessions (est. $52,000 in revenues). Registration fees covered all workshop-related expenses (facility rental, speaker travel and fees, meals and refreshments, equipment and educational materials distributed to the arborists).

ENGAGING YOUTH, SERVING COMMUNITY PROJECT

Juanita Johnson, Karol Osborne, Berteal Rogers, Kris Mayers, Carolyn Robinson, Sarah Sims; Youth Development

Key Theme: Developing After School Programs

In the America After 3 PM Survey conducted by the Afterschool Alliance, Louisiana parents and guardians were asked about their children's regular participation in various afterschool care arrangements. It was reported that, while most Louisiana children, 69%, spend some portion of the hours after school in the care of a parent or guardian, 21% of Louisiana's K-12 youth are responsible for taking care of themselves. These children spend an average of more than 6 hours per week unsupervised after school. In contrast, only 15% of Louisiana's K-12 youth participate in afterschool programs. On average, afterschool participants spend 6 hours per week in afterschool programs. Participation averages 2.8 days per week for 1.8 hours per day.

An after-school project, the Engaging Youth, Serving Community (EYSC) was conducted in a three-parish area: Madison, East Carroll and West Carroll parishes. The Madison Parish group served as the project's design team and provided training and support for the other two sites. The purpose of the project was: Inclusion of youth in developing policies that affect communities where they live and involving youth in problem solving and implementing of solutions that address community needs. We worked with a committee of 20 youth and adults to plan, implement and evaluate a model to involve youth in policy and decision making and in community action to give participants the collaborative experience and the opportunity of working in a diverse group. Participants gained skills and experiences such as strategic planning, decision making, public speaking, working in partnership with adults, organization and resource management and evaluation and assessment through participation in workshops, conference retreats and training activities.

Source of Funds

USDA, National 4-H Council, Smith-Lever

CITIZENSHIP LOUISIANA FOCUS PROGRAM

Juanita Johnson, Ken Spoto, Joe Bairnsfather, Christina Guillory, Karol Osborne, Will Woods; Youth Development

Key Theme: Community Development through Youth

The Citizenship Louisiana Focus (CLF) Program provides high school youth the chance to explore the political process firsthand with the state's capitol, Baton Rouge as its classroom. The CLF curriculum revolves around group activities, challenging youth to think critically and participate in lively discussions about current issues and policies by becoming active in civic activities. Being an active citizen is not just about voting. It involves gathering information, making informed decisions, listening to others, analyzing information, understanding compromise, understanding who is going to be the best person to represent you, and then making a choice. The program involves youth in deliberate debates that are a training ground for creating active citizens because the youth are involved in reading, analyzing, talking, listening, and making choices in a structured and safe environment. Participation in the program helps youth gain a greater understanding of the importance of civic and social responsibilities.

The annual Citizenship Louisiana Focus conference brings together a diverse group of youth and adults from across the state who are interested in civic education. CLF is a fast-paced three days, with a specifically designed curriculum revolving around four distinct group activities that are each creatively challenging participants to think critically and participate in debates about current issues and concerns relating to youth problems. Included in the program are seminars, a mock senate activity, community leadership workshops and current issue reporting through a letter-writing research and development exercise.

CLF is a civic education and leadership program organized by the Department of 4-H Youth Development with the help of a team of parish Extension Agents. 4-H delegates from across the state broaden their appreciation and respect for themselves and others in the world through civic workshops, committees, field trips and social events.

Participants learn and practice skills intended to make them better citizens and successful individuals. An evaluation of the program indicates that CLF increases youths` sense of their capacities and commitments through participation in simulations, service learning, and exposure to role models. Of these, simulations and exposure to role models had the broadest impact. Will Woods, County Agent and a former CLF chaperone indicated that, "Citizenship Louisiana Focus is a good program that helps the 4-H'ers develop leadership and socialization skills as they build relationships with other students from across the state"; The program not only promotes civic learning and provides youth opportunities to gain skills and knowledge to participate in a democracy, but also teaches the skills and dispositions essential to youths' social and working lives: team building, working across differences, collaboration, listening, and negotiating.

Source of Funds

Louisiana 4-H Foundation, the National 4-H Council, the U.S. Department of Agriculture, the Louisiana Highway Safety Commission, the Louisiana Office of the Attorney General and the LSU AgCenter

YOUTH HEALTH AND SAFETY: UNDERAGE DRINKING AND DRIVING

J. Johnson, S. Russell, C. Robinson, K. Singleton, S. Givens, J. McCann; Youth Development

Key Theme: Youth Awareness of Alcohol

Underage drinking cost the citizens of Louisiana $1.1 billion in 2005. These costs include medical care, work loss, and pain and suffering associated with the multiple problems resulting from the use of alcohol by youth. This translates to a cost of $2,241 per year for each youth in the State. Louisiana ranks 20th highest among the 50 states for the cost per youth of underage drinking. Youth violence (homicide, suicide, aggravated assault) and traffic crashes attributable to alcohol use by underage youth in Louisiana represent the largest costs for the State. Young people who begin drinking before age 15 are four times more likely to develop alcohol dependence and are two and a half times more likely to become abusers of alcohol than those who begin drinking at age 21.2.

In six parishes across Louisiana including, St. Helena, East Carroll, West Carroll, East Baton Rouge, Caldwell and Calcasieu youth and adults came together to learn more about the latest research on the impact of underage drinking on both individuals and the community, and to discuss how their community could best prevent underage alcohol use by organizing youth service-learning projects. The LSU AgCenter, representatives from Louisiana's Office of the Attorney General and local officials, parents and youth joined community leaders and organizations (spanning health, education, law enforcement, and highway safety) to encourage parents and guardians to talk with their children early and often about the negative effects of

alcohol. These community forums hosted by trained facilitators eliminated barriers to participation by bringing community members together to share common experiences and concerns and to develop cohesion and unity.

The community forums were the main events of project where youth and adults completed Action Plans to host teach-ins to educate other youth and family members about the perils of underage alcohol consumption. Also, the LSU AgCenter teamed with Louisiana's Office of the Attorney General to help increase youth awareness about the dangers of underage drinking and driving through the U Drink U Drive U Walk campaign. The Attorney General's Office provided U Drink, U Drive, U Walk awareness materials like Tee-shirts, key rings, pens, bookmarks, book covers, stickers and stadium seats in order to help youth and adults create action plans and implement the program in their communities. Community groups conducted youth-led activities including floats in community parades, booths at parish-wide events, seminars, school-wide assemblies and, a parish-wide Youth Health Fair.

Source of Funds

Louisiana Office of the Attorney General, Louisiana Highway Safety Commission

Sparta Education Program Promotes Conservation

Karen M. Martin, Jason Ables, Joan Almond, Bill Branch, Robin Bridges, Lauribeth Coker, Cathy Judd, Jason Holmes, Lisa Holmes, Rebecca Kelley, Donny Moon, Allen Nipper, Becky Owen, Carol Remy, Markaye Russell, Teresa Price, Amanda Sewell, Amanda Simmons, Cynthia Stephens, Gary Stockton, Diane Uzzle

Key Theme: Water Quality & Availability

Our drinking water comes from two major sources - surface water and groundwater. Surface water includes rivers, lakes, streams and reservoirs. Groundwater includes underground aquifers. The Sparta Aquifer serves 15 north Louisiana parishes. Fifty five percent of the water usage is for public supply according to the U.S.G.S. (2000). Increased water use is reducing the amount of available water in the Sparta Aquifer and the Sparta Aquifer is losing 12 million gallons of water per day that aren't being replaced. Falling water leads to less water in wells, more saltwater intrusion, and reduced recharge capacity. To help prevent the depletion of these aquifers there are easy, practical ways to conserve water without depriving yourself or changing your lifestyle.

This past year parishes in the Sparta Aquifer region participated in a comprehensive water conservation education promotion. Youth and adults were provided educational materials and involved in programs focused on creating awareness about water conservation. Fact sheets and displays were prepared and utilized at a variety of locations. Events were held at parks, hospitals, schools, community locations and during the annual Ag Expo. Parish 4-H programs focused programming efforts during monthly school 4-H meetings on environmental and water education. Monthly parish 4-H newsletters and local newspapers published water conservation tips. Public service announcements about water conservation and Sparta awareness were recorded by parish 4-H members, Volunteers and AgCenter Faculty and were played on local radio stations KXKZ and KPCH.

Fifty-five thousand Sparta Aquifer fact sheets and a Home Water Survey were distributed to students in Bienville, Claiborne, Jackson, Lincoln, Morehouse, Ouachita, Union, Webster, and Winn to teach about the Sparta Aquifer and provide water saving tips for students to take home. 225 posters highlighting water saving tips were placed throughout the area at schools and businesses. 1600 teacher packets which included lessons, water trivia and conservation tips were provided to elementary, middle and high school teachers. The Sparta Educational Trailer was stationed at locations throughout the region at events such as fairs, festivals, field days, trainings, trade shows, project days, and parish meetings as well as at grocery stores and libraries. Fifty eight 4-H members and adult volunteers worked by sharing educational information about the Sparta Aquifer with the public. Approximately 10,000 people visited the exhibit and Water Conservation fact sheets were disseminated. People viewing the exhibit asked questions and indicated they learned new ways to conserve water. In addition to efforts with the Sparta Educational Trailer, youth and adults helped promote the effort by preparing posters, working at events, and conducting programs and contests reaching over 5000.

Over 800 youth at 4-H Camp learned about aquifers and provided ideas of ways to conserve water. Public service announcements that were played on local radio stations KXKZ and KPCH generated interest and many community members

commented on having heard the announcements and found them useful.

The French Quarter Formosan Termite Management

Alan L. Morgan, Dennis Ring; Entomology

Key Theme: Integrated Pest Management

Coptotermes formosanus Shiraki (the Formosan termite) is a serious pest in several parts of the U.S. and is one of the most destructive insects in Louisiana. It attacks both living trees and structural wood. The management of this pest is critical to the economic well-being of not only Louisiana, but the US. Estimates of property damage, repairs, and control measures exceed $1billion per year in the U.S., of which over $500 million is in Louisiana. Loses include the collapse and demolition of structures and defaults on mortgages. State and local government is being forced to expend limited resources and funds to repair public and government buildings. Termite damage and costs associated with it impacts not only the homeowner, but also builders, real estate agents, bank and mortgage companies, insurance companies, state and local governments, the nursery industry and landscapers.

A wide-area termite management program was implemented in the French Quarter of New Orleans by the LSU AgCenter and USDA's Agricultural Research Service in 1998. The program is now in its fourth phase and approximately 1500 properties within a 60 block area have been treated for termites. Efforts are underway to bring 100% of the properties in the test area into the program. In addition, an educational program is underway to make residents and property owners more aware of the Formosan termite, the damage that it causes and methods to control and management this insect.

Since the inception of the program, data has indicated a 50% reduction in the number of reproductive alates (winged termites) in the treated area of the French Quarter Property owners. There are also indications that property owners in the French Quarter with property located outside of the test area are adopting the termite management methods and treatments being used in the program. Physical inspections are being made in all of the properties in the test area to locate and treat hidden infestation, of Formosan termites. Data indicates that about 60% of the trees that were infested with Formosan termites have no termites 72 months after treatment. Other methods of termite management such as the use of pressure treated wood in building and repairing structures is beginning to be adopted. There is a general overall increase in knowledge by the general public and property owners of the area in matters concerning termite management techniques as indicated by the number of property owners outside of the program area that are now using treatment methods recommended and used in the program.

Source of Funds

USDA, Agricultural Research Service

Community Leadership Camp; Economic Development Program (CLED)

Karen B. Overstreet, Sanford Dooley; Economic Development

Key Theme: Community Development

The LSU AgCenter, rural electric cooperatives and Louisiana Economic Development partner with local entities to improve the quality of life in rural parishes. Empowering local citizens to assume responsibility for resolving some of their own issues increases the likelihood that they will support necessary activities. Students are included in the program as a way to encourage their participation in community decisions.

A series of three hour classes held once a week for 10 weeks is conducted by the AgCenter, LED and others. The local parish/community must take ownership of the program by developing a steering committee, recruiting a class, and handling local arrangements and finances. To date, 25 programs have been conducted with about 800 graduates.
A follow up survey of several classes revealed the following:

27% held office prior to participating in the class.
An additional 30% either ran for office or were appointed to a board, commission, etc. after completing the class.

92% of the respondents serve as volunteers in their communities.
50% said their volunteer efforts have increased since completing the class.
82% have been involved in community projects since completing the class.

The program has led to local recycling programs, farmer's markets, job fairs, welfare to work projects, recreational trails, community enrichment centers, housing and retirement facilities, downtown development, industrial parks, business retention and expansion programs, daycare centers, and efforts to improve water, drainage, zoning and transportation issues local businesses; organizations, utility companies and state dept. of economic development.

Community or Area Wide Fire Ant Management

Dale Pollet **Entomology**

Key Theme: Integrated Pest Management

Everyone is affected by fire ants through stings, damage to equipment by mounds, loss of production in crops and animals, damage to livestock and wildlife and loss of power through damage to electrical systems in homes, farms and business. The loss of time and money caused by fire ants has grown dramatically to both the general public and to agriculture. the entire state of Louisiana is infested.

A program has been developed to educate the public and farmers to help manage the fire ant. A card was produced and distributed throughout the state to inform the public about the program, listing contacts to help set up and organize interested groups. Spreaders were supplied to 18 parishes to assist with the application of Insect growth regulators to manage this pest. The spreader are made for attachment to 4-wheelers or riding lawn tractors with hitches to treat large areas and can be requested through the county agents offices. demonstrations with various commodities and groups have been set up. Communities, subdivisions, Master Gardeners and farmers across the state were educated about fire ant management and then implemented the program. A poultry farmer said that the program saved him about $1000 in electrical equipment and motors and increased his production by reducing stress on the birds the workers and by reducing his feed loss. A cattle farmer said he could use the program to manage fire ants in the calving area to reduce losses at birth. A hay farmer said it saved her money on damage to equipment, down time, and reduced injury to her and the workers,(video on web). A police jury reduced down time and allowed for easier cleanup at public areas and the university saw a reduction in problems for tailgaters and visitors as well as students and workers on campus. Several subdivisions have said it was a pleasure to go outside and not see fire ants or have to worry about stings to pets and children. A pecan grower said the program reduced damage to his equipment and made for easier

Source of Funds

Funding is through a state and industry grants.

The LaHouse "Rebuild Safer, Stronger, Smarter Homes" Initiative

Claudette Reichel **Biological and Ag Engineering**

Key Theme: Home Safety

Hurricanes Katrina and Rita caused an unprecedented amount of damage to homes and displaced hundreds of thousands in Louisiana. Families and the region`s recovery is hampered by lack of inhabitable housing, financial capacity to rebuild or restore damaged homes, and severe labor and material shortages and price hikes. 2. Massive mold growth in damaged homes caused health hazards, concern, confusion and very high remediation costs. 3. The cost and generating capacity of energy has escalated need and demand for energy efficiency. 4. Strong statewide uniform building codes were enacted, including wind standards, create a major learning curve and shortage of The LaHouse demonstration, in mid-construction with its hazard resistant features exposed, was opened to the public and media as an educational resource following the storms.

A Rebuild Safer, Stronger, Smarter Homes educational outreach program was launched and implemented, involving collaboration and support (funding) from U.S. Dept. of Energy, Building Science Corp., FEMA, URS, and many corporate

and foundation partners.

- An interagency housing information exchange group was assembled to foster program connectivity and communication.
- "Best Building Practices for the Gulf Region"; curriculum and materials were developed and seminars conducted in 6 cites by national experts.
- Additional hurricane resistant construction seminars were conducted and materials developed with industry collaborators. inspectors.
- LaHouse provided technical tours for professional groups, conferences, FEMA employees, media reporters and storm victims.
- Presentations about post-storm housing issues and lessons were made in national, state and local venues.
- New consumer education materials, and agent training, were developed on mold remediation and health effects.
- The Storm Recovery Guide publication was revised; guidance on hazard-resistant and energy saving home restoration was added.
- The content of the Building Your La. House - Homeowners Guide book was updated and is being reformatted into a web based content management system for both the LSU AgCenter site and the La. Road Home web site for disaster recovery grant applicants.

The LaHouse project and program have involved more than 260 collaborators and sponsors, including national and local government agencies, corporations and organizations.

Source of Funds

U.S. Dept. of Energy Building America Program, FEMA, La. Office of Homeland Security and Emergency Preparedness, Building Science Corp. (in-kind), and approximately 200 LaHouse contributors.

Salt Water Intrusion on Rice Land in Southwest Louisiana, Its Effects and Remediation

John Saichuk, Gary Breitenbeck; Agronomy & Environmental Management

Key Theme: Soil Assessment & Remediation

In the fall of 2005 hurricane Rita struck the southwestern coast of Louisiana pushing ahead of it a tidal surge of brackish to salty water. Water reached depths of four or more feet and remained for several days or weeks in some places. When the water receded it left in its wake in addition to the mass destruction of property and livestock varying amounts of salt. The immediate question was how much and how extensive was this deposition.

The LSU AgCenter in conjunction with other governmental agencies and the agricultural industry took on the task of sampling soil in the affected areas. These samples were taken in a systematic manner to provide an estimate of the extent of the problem. The Soil Testing Lab of the AgCenter developed a method to handle the volume of these samples to facilitate a rapid turn-around. Dr. Gary Breitenbeck designed and started research to provide guidance to farmers regarding crop safety and soil remediation.

The AgCenter took the lead in establishing a protocol for mapping, sampling and analyzing soil samples taken throughout the salt affected areas of southwestern Louisiana. AgCenter personnel involved included county agents.

Source of Funds

All funding was internal. Funds were provided and accounts set up to purchase equipment where needed and to cover the expenses of analyzing hundreds of soil and water samples taken in a very short period of time.

Parents Preparing for Success - A Statewide Effort

Diane D. Sasser, Donna Shaffers, Loren Marks, Emily Braud, Rebecca White; Human Ecology

Key Theme: Parenting

Parents are a child's first teacher, role model, inspiration, moral guide, and protector. Research indicates that the first three years are critical in the brain development of a child and that high quality care is essential in meeting a child's needs for intellectual, social, physical, and emotional development. Recent developments in neuroscience provide information indicating that a baby's early interactions with parents, caregivers and others in his or her environment, specifically prenatal through the first three years of life, actually affect the size and structure of the mind as it develops. Therefore, rich and varied interactions have a strong, positive impact on the size and structure of the brain. Conversely, neglect, abuse, and highly chaotic environments tend to have negative effects on brain structure and function (Ramy & Ramy, 1999; Shore, 1997). Parent and infant bonding (which occurs within the sensitive time in the first hours to days after birth) and subsequent attachment is vital to an infants well-being by contributing to their emotional grown which also impacts their development in other areas like physical growth (Brazelton, 1994).

Research shows the following are indicators that contribute to the converse, child abuse and neglect: inadequate parenting skills and lack of knowledge regarding child development, unrealistic expectations of the child, perception of child as a means of satisfying the parent's needs, lack of empathy for the child's needs, and self-centered parents (Carroll, K.E., 1996). The LSU AgCenter provides parenting education classes throughout Louisiana. Family and Consumer Science educators (professional and paraprofessional) are offering 6 classes (18 hours) of parenting education workshop each week every six weeks. LSU AgCenter professional faculty members are providing the service in 51 locations across
Twenty five educators reached 1888 parents in 2006 and 47% of these (887) completed the entire series of 6 classes.

Program evaluation of a selected portion of the training program indicated parents showed statistically significant knowledge gain after attending six workshops sessions in the Parents Preparing for Success Program. Additionally, it the state. was found that parents are practicing some of the skills they learned, implementing more developmentally appropriate practices that are beneficial to children.

Source of Funds

Louisiana Department of Social Services

Louisiana Master Gardener Hurricane Relief Fund

Robert J. Souvestre Horticulture

Key Theme: Hurricane Recovery

Thirteen Louisiana Master Gardener™; Extension Volunteer Programs representing 30 parishes (almost half of our state) were directly impacted by Hurricanes Katrina and Rita. The LSU AgCenter, in cooperation with the Louisiana 4-H Foundation, developed a Louisiana Master Gardener Hurricane Relief Fund to help rebuild their programs and communities. Funding was solicited nationally and the following states responded with monetary and in-kind gifts and service: AL, AR, CA, CO, FL, IL, IN, KS, LA, MA, MD, MN, NC, NJ, NY, OR, RI, SC, VA, WA, WI, WV, and WY. Over $11,000 dollars have been collected and awarded. Fifteen projects received funding in eight parishes: Avoyelles, East Baton Rouge, Jefferson, Orleans, St. Helena, St. Tammany, Terrebonne and Washington. In addition, a number of parishes received donated horticultural publications to reestablish their parish LMG libraries and volunteer assistance from out-of-state MG programs.

Master Gardeners played an important role in the hurricane recovery process. This was made possible by donations. Master Gardener programs are varied and diversified and touch a great number of people, directly and indirectly, from youth to seniors. Projects that were awarded funding include restoring the Jean Lafitte Nature Study Park, Common Grounds community gardens, Lafreniere Park ";sun garden,"; Woodmere Elementary Outdoor Classroom, Darcey Park tree replacement, rose garden at City Park Botanical Garden, Habitat for Humanity landscaping, Pelican Greenhouse restoration

at NO Botanical Garden, Growing of Landscape plants for reestablishing domestic landscapes, and the Grand Isle Butterfly Dome.

These are remarks from Master Gardener programs that received assistance.

"The impact of this grant was not only to help restore the Botanical Garden, but to give moral support to the staff and volunteers who were so bravely trying to restore a treasure in New Orleans in the midst of their own personal crises."

"The new trees, although small in stature compared to those destroyed, in time will add value and beauty to the park for its neighbors and their children. The impact thus far is positive as people are slowly returning to the park. This is truly the only place within several miles to enjoy the beauty of nature while watching the little ones play."

"The Butterfly Dome has become a major landmark and icon of Grand Isle. To date over 12,000 people from all over the world have visited the dome. The grant that helped us in restoring the butterfly dome was such a blessing. Some of the pride and hope of Grand Isle residents was restored when the restoration got under way. A place of beauty, teeming with flora and butterflies, had been restored while the local residents were busy repairing what could be repaired and clearing the tons of debris left by the devastation of hurricanes Katrina and Rita. The tourists, visitors, and local residents will benefit by the island once again having this educational and entertaining attraction. We thank you again for helping us rebuild this educational facility and tourist attraction on Grand Isle."

"The LaTerre Master Gardeners successfully completed landscaping fifteen homes in the Habitat Bon Jovi Subdivision in Gray, Louisiana. Residents of this subdivision were people displaced by hurricanes Katrina and Rita. Having contact with the homeowners was especially rewarding. Seeing their delight at the newly landscaped yard and their appreciation was definitely a gratifying experience for all of us. We were able to help others, join together as a team to develop a plan and then see that plan come to fruition. On behalf of the LaTerre Master Gardeners we sincerely thank you for your generous contribution in allowing us to reach our goal of impacting our community."

"Hurricanes Katrina and Rita left destruction in St. Helena Parish, but recovery included unexpected gifts. Our community, school, staff and students thanked us and we sincerely thank all of you. 'First Impressions' do count. School pride can be a powerful tool for building character and rebuilding a community. Due to vastly changed landscapes and business environments following Hurricane Katrina, the Northshore Spring Garden Show offered the opportunity for local homeowners to obtain relevant information on restoration of their landscapes."

"The garden will be used by the teachers for science projects. The addition of this colorful and animated garden to the grounds of Woodmere Elementary has brought beauty and interest to a place and a group of youngsters that have endured much loss in the past year."; ";The public education at the Foundation Center in Lafreniere Park reached several hundred people with information that was extremely helpful in restoring landscapes damaged by Hurricane Katrina and, on behalf of the project team, we appreciate receiving the funds that enabled us to be able to accomplish this project."

Source of Funds

Smith-Lever 3b+c, self generated funds, parish LMG Associations, FNP funds, donations, other states

Building Financially Literate Youth

Jeanette A. Tucker, Beverly Bailey; Ginger Boutwell, Margaret Burlew, Melissa Cater, Deborah Cross, Sheri Fair, Terry Foster, Carolyn Leperi, Kathy Mauthe, Laura Lea Perault, Cynthia Stephens, Cindy Richard, Adrianne Vidrine, Denise Zeringue; 4-H Youth Development

Key Theme: Literacy

On a nationwide survey of financial literacy, Louisiana high school seniors scored only 47.2%. Teenagers spend an average of $91 per week. Ten percent of teens 12-19 have their own credit cards. Over 1/3 of students have an ATM card. University administrators state that they lose more students to credit card debt, than to academic failure. Graduating college students have an average of $20,402 in combined education loan and credit card balances. The fastest growing group declaring

bankruptcy is young adults 20 - 24. Research has shown that as little as 10 hours of personal financial education positively affects students' spending and saving habits. Ideally, graduating Louisiana high school seniors will have developed sound money management skills. In response to this need, Louisiana lawmakers enacted legislation in 2003 to require money management be taught in Free Enterprise classes in all public schools beginning the 2004-2005 school year.

To prepare high school teachers to teach the required money management content, 67 six-hour workshops were conducted across Louisiana during 2003-2006 by the AgCenter Family Resource Management team of educators. A short-term goal of this initiative is for Free Enterprise teachers and other educators to become proficient in educating students in personal financial management. The long-term goal of this educational program is to produce a financially literate and economically self-sufficient future workforce who will, in turn, be equipped to contribute to the economic vitality of their community, state, and nation. The National Endowment for Financial Education High School Financial Planning®; curriculum was used as a basis for the training. Topics addressed include financial planning and goal setting, careers, budgeting, savings and investments, credit, and insurance. The workshop and educational materials were provided to the teachers at no charge. To enhance program outreach, this initiative has been shared at five national conferences, one regional conference and at the Louisiana School Boards Association Annual meeting. The teacher training initiative will continue during the summer of 2007.

A total of 582 teachers from 351 schools in all 64 Louisiana parishes participated in the workshops. Participants represented public, private, parochial and home schools; learning centers, correctional institutions and the Louisiana Youth Challenge Program.

Participants' self-assessment of their preparation to teach high school students about money management increased significantly. Teachers were asked to rank, on a scale from one to five, how well prepared they felt they were to teach high school students about money management before and after the workshop. Scores increased 36% from 3.36 before the session to 4.56 after completing the session. 566 teachers report that they will use the HSFPP and other information shared at the workshop to teach approximately 50,535 students each year (89 students each).

Participants' comments include the following: ";I now have confidence to teach financial planning."; ";I learned how to teach finance at a student level."; ";The workshop provided structure for many of the topics that I taught ";off the cuff"; last year."; Students can relate to this program more than seeing it in a textbook."; ";The information on credit and budgeting will be most beneficial for my students."; ";I plan to follow the entire course instruction and implement it into the overall Free Enterprise program."; Participants benefited both professionally and personally from the training sessions. One participant wrote, ";We refinanced our home because of a conversation I had with you (after the workshop). You have saved us a fortune!";

The real measure of the program's success is its impact on students. Analysis of student evaluations suggested:
* Student assessments showed an increase in overall knowledge gained, with mean scores increasing from 62.69 to 70.03.
* Students posted the greatest knowledge gain in budgeting, a key skill for future financial success. Mean scores increased from 61.48 to 76.52.
* Scores measuring students' knowledge about insurance followed with mean scores increasing from 54.11 to 63.45.
* Saving and investing scores increased from 47.28 to 55.36. Students posted lowest pre-test scores on this topic.
* Scores on the credit portion of the survey improved from 63.28 to 69.58.

Evaluation of this LSU AgCenter program reveals that instruction in the HSFPP curriculum increases student's knowledge, thus preparing them to become financially literate consumers and self-sufficient, productive members of the state's workforce.

Source of Funds

Consumer Credit Counseling Service-Baton Rouge/Money Management Incorporated, Louisiana Bankers Association, Louisiana Public Broadcasting, National Endowment for Financial Education, LSU AgCenter, Louisiana Jump$tart Coalition for Financial Literacy, Credit Bureau of Baton Rouge, Help Ministries d/b/a Debt Free, McGraw Hill and LSU AgCenter

Improving Childcare Quality in Louisiana

Rebecca E. White, Cheri Gioe, Emily Braud, Diane Sasser; Human Ecology

Key Theme: Child Care/Dependent Care

Everyday in Louisiana, thousands of children are left in childcare arrangements. High quality childcare is a critical issue for improving developmental outcomes and the quality of life for children. Although quality of childcare is critical, research indicates that most childcare is poor to mediocre. However, research has shown that education and training of childcare providers directly correlates with higher quality care environments for children. It is estimated there are over 20,000 childcare providers in Louisiana. The state of Louisiana requires all childcare providers in licensed centers or who are registered family childcare homes to obtain continuing education annually. There is a significant need to provide accessible education and training for these childcare providers.

The LSU AgCenter conducts the Louisiana Childcare Provider Training Program, providing continuing education classes throughout Louisiana for childcare providers. Louisiana childcare providers in center-based and family-based settings are offered educational opportunities to obtain required hours of childcare provider training. LSU AgCenter professional faculty members are providing the service in over 35 locations across the state.

Four hundred forty-eight (448) educational classes were conducted by 19 Family and Consumer Sciences agents for childcare providers in 2006. Nine thousand four hundred fifty (9450) training certificates were awarded to childcare providers who participated in three-hour training sessions offered by the LSU AgCenter.

Program evaluation of a selected portion of the training program indicated childcare providers showed statistically significant knowledge gain after attending four training sessions in the Right from Birth training series. Additionally, it was found that childcare providers are using the information they learned and implementing more recommended care practices that are beneficial to children.

A research study was conducted of the Louisiana Childcare Provider Training Program by Carrie Ota, a Master's candidate in Human Ecology (LSU Advisor Dr. Cynthia DiCarlo). This study examined the Right from Birth childcare provider training series as it related to changes in child caregiver responsive behaviors.

Source of Funds

Legislature, Louisiana Department of Social Services, participant registration fees

Promoting Hands Out and Heads Up for Healthy Hearts: The Louisiana 4-H Service-Learning Program

Janet Fox, Renee Castro; Jeannie Crnkovic; Joe Barrett; Louise McDonald; Lola Boone; Katherine Pace; Ken Spoto; Beverly Bailey; Todd Tarifa; Tina Guillory; Blair Hebert; Ada Palermo; Christy Sorenson; Beverly Madere; Ann Gauthier; Chantel Williams; Kim Jones Angie Arnould; Jan Coussan; Charles Hebert; Layne Langley; Steve Borel; Lisa Benoit; Josh Domingue; Shaney Hill; Robin Walker; Hilton Waits; Shannan Waits; Lisa Holmes; Jennifer Bell; Becky Kelley; Donnie Moon; Lisa Arcemont; Debbie Bairnsfather; Lanette Hebert; Karen Martin; Mark Tassin; Sarah Williams; 4-H Youth Development

Key Theme: Service Learning

Service-learning yields "added value" to multiple participants from schools, non-profit organizations and communities having multiple benefits for each. Research shows that when service-learning is designed in particular ways, students show gains on measures of academic achievement. Some researchers found that many service-learning tasks help students to improve higher order thinking skills such as analysis, problem solving, decision-making, cognitive complexity, and inferential comprehension because they are exposed to relevant tasks that require them to use these types of skills. Service-learning has been shown to promote responsibility, trustworthiness, and caring for others. Many studies show that young people who engage in service-learning are less likely to engage in risky behaviors such as smoking, unprotected sexual

relationships, and drug use. Service-learning helps young people develop stronger ties to their schools, communities, and society. Through their service-learning experiences, many students come into contact with adults in careers that would otherwise remain hidden to them.

The National and Community Service Act (1990) laid the foundation of service-learning as it:

Promotes learning through active participation in service experiences
Provides structured time for students to reflect by thinking, discussing and/or writing about their service experience
Provides an opportunity for students to use skills and knowledge in real-life situations
Extends learning beyond the classroom and into the community
Fosters a sense of caring for others
The State 4-H Service-Learning Team, supported by local 4-H agents and 4-H members, has been laying the groundwork for the Service-Learning Initiative. Parish teams made up of youth, adult volunteers and 4-H Agents participated in a Statewide Service-Learning training to build a strong foundation for success for parish service-

Williams learning programs. As a result of the training, parish teams applied their knowledge to develop service-learning projects designed to meet the needs of local parishes. The parish service-learning programs focused on a wide range of topics from disaster relief to health issues to literacy to environmental issues to children's needs.

After participating in Parish 4-H Service Learning Programs, youth participants indicated the following of their experiences:

96% of participants felt that they showed people they care by participating in the service-learning program.
94% of participants felt it was important to think about ways to improve their community.
94% of participants feel it is important to have the chance to volunteer or help out in their community/parish.
94% of participants feel it is important to help make their community/parish a better place to live.
93% of participants felt their service-learning project met a community or parish need.
92% of participants reported that their service-learning project made them think about the needs of their community/parish.
92% of participants understand the needs of their community/parish as a result of their service-learning project.
92% of participants feel comfortable talking with other youth in their community/parish.
91% of participants feel they can use what they learned from their service-learning project in other volunteer opportunities.
91% of participants feel it is important to have adults they can turn to when they need help.
91% of participants learned throughout the service-learning project.
88% of participants now have a better understanding of what others are going through in their community/parish.
88% of participants felt their service-learning project allowed them to be creative.
87% of participants felt they can relate better to others that may seem different.
86% of participants felt that they are more comfortable solving problems.
86% of participants felt that they are more responsible.

Enhancing Youth Leadership Skills Through State 4-H Leadership Boards

Janet Fox, Jennifer Bell; Lois Brister; Amanda Caruso; Jeannie Crnkovic; Ada Palermo; Todd Tarifa; Tanya Walker; 4-H Youth Development

Key Theme: Leadership Training and Development

As we enter the third millennium, one of the most pressing issues facing youth organizations is how to effectively facilitate the development of leadership skills in youth today. To become productive and contributing individuals who can be proactive in determining the course of tomorrow's world, today's youth must develop positive skills. Preparing today's youth for their roles as tomorrow's leaders is a challenge we all face (Culp and Cox, 2002).

The Louisiana 4-H program is committed to developing leadership skills in both youth. One of the methods in which leadership skills are developed and enhanced is through the State 4-H Leadership Board experience. More than 80 youth serve on one of four statewide youth leadership teams including the Executive Committee, Fashion Board, Food and Fitness

Board, and the Technology Team. These Leadership Boards give youth the opportunity to work together on a common focus while developing leadership for statewide programs. The youth serving on these boards provide valuable leadership and guidance to the positive direction of the 4-H program.

As a result of serving on one of the four State 4-H Leadership Boards (Executive, Fashion, Food and Fitness, and Technology), 4-H members indicated the following:

100% felt that they mastered skills related to the Board they served on.
100% felt they increased their knowledge of the opportunities within 4-H.
100% reported that they were able to think independently while serving as a member of the Board.
100% had a positive feeling about their future.
97% felt they increased their subject matter knowledge related to the Board they served on.
97% mastered leadership skills as well as improved their ability to communicate with others.
95% increased their organizational and planning skills.
91% rated their State Board experiences as one of the best
97% said they would recommend being a State Board Member to one of their friends.

When asked to share their leadership experiences as a result of being a Board member, the following comments were obtained:

"The lessons I learned have helped me to lead my club in a positive direction." "Being on the executive committee and state advisory committee was awesome for me. I met so many new people and I felt that my voice and ideas were really heard. It was the greatest leadership experience yet."

Some experiences that the Board members participated in and had a positive impact in their lives were:

Source of Funds

Louisiana 4-H Foundation
State 4-H Office

Protecting 4-H Youth and Adults Through the Overnight Chaperone Program

Janet Fox, Lisa Arcemont, Debbie Bairnsfather, Lanette Hebert, Karen Martin, Mark Tassin; Youth Development

Key Theme: Creating Safe Environments

Community youth organizations are focused on positively helping youth grow up and develop their capacities (Pittman, 1991). The National 4-H Impact Design team (2001) identified providing a safe environment as one of the characteristics of effective youth programs. A safe environment is one where youth should not fear physical or emotional harm while participating in the youth development experience whether from the learning environment, from adults, from their contemporaries or from spectators.

In providing safe environments, youth organizations have the responsibility to protect of the youth and adults involved in their programs. According to the National Child Abuse and Neglect System (2004), the perpetrators of abuse are individuals responsible for the care and supervision of their victims (Finkelhor and Ormrod, 2000; Lauritsen, 2003). Youth organizations are under a microscope to exercise a higher degree of care for the prevention of abuse to any child while participating in functions (Anglin, 2002).

The Overnight Chaperone Program is a three-part process that helps ensure a developmentally appropriate environment for youth. Through Overnight Chaperone Program training, the LSU AgCenter provides paid and unpaid staff with the tools to lead a positive, successful overnight situation. Conducted by local 4-H Agents, the training provides instruction on creating positive environments for youth, child guidance protection, adult protection, health and safety and crisis management. Through the screening process, the LSU Ag Center ensures that adults involved in leadership for overnight events are free from background concerns that may hinder their ability to provide a safe environment for youth. Finally, overnight chaperones sign a code of conduct form to document that they understand the responsibilities and behaviors expected of them

in their roles as overnight chaperones. Over 800 adults have completed the Overnight Chaperone Program. In a follow-up six weeks following the training, participants indicated the following:

- 98% gained information on how to create a positive environment for youth.
- 97% increased their understanding on how to maintain safe environments for youth.
- 96% are more aware of health and safety considerations in overnight settings.
- 95% feel more prepared to handle crisis situations.
- 95% are more prepared to handle emergency situations.
- 95% increased their knowledge of the signs of child abuse.
- 95% increased their knowledge of the types of child abuse.
- 94% increased their understanding on how to protect adults in overnight situations.
- 94% felt more comfortable handling discipline problems.

Participants Said:

"This training is a plus for 4-H and should have been started years ago."
"Really opened my eyes to a lot of things I have never thought of."
"The training was valuable and informative. It went beyond the other trainings I have received"
"The training was very helpful. It opened my thinking about children misbehaving and why."
"I am pleased to know we will have safe and educated parents to stay with our kids when we cannot be there."
"The training was very thorough, and done in a very good manner. I felt comfortable. I was refreshed in

Source of Funds

Extension Administration

The State 4-H Leadership Conference: Building Leadership Skills in Youth

Janet Fox, Angie Arnould; Debbie Bairnsfather; Joe Bairnsfather, Jennifer Bell; Peter Cannizzaro; Terril Faul; Jake Fontenot; Lanette Hebert; Blair Hebert Becky Owen; Amy Long-Pierre; Drusilla Levrier; Jennifer Bell; Carol Remy; Amanda Simmons; Trey Williams; 4-H Youth Development

Key Theme: Leadership Training and Development

One of the most pressing issues facing youth serving organizations is how to effectively facilitate the development of leadership skills within our youth. Helping to equip youth with leadership is critical to the future of the nation (Culp and Cox, 2002). President John F. Kennedy said, "Leadership and learning are indispensable to each other." Given the increased emphasis on leadership development in 4-H Youth Development, it is important to know if the needs youth and the organization are being met during programming. Cantrell, Heinsohn, and Doebler (1989) found that youth perceive a positive relation between life skill development and participation in leadership activities at succeeding levels of leadership responsibility. Leadership skill development increased when 4-H members had leadership experience beyond their club level. As youth develop and sharpen leadership skills, they become more equipped to be placed in roles of progressively greater responsibility.

Over 250 youth participated in the Louisiana 4-H Junior Leadership Conference held at 4-H Camp Grant Walker. The 4-H Junior Leadership Conference provides the opportunity for diverse groups of youth who are currently engaged in significant leadership and /or service learning activities to come together while further learning and developing their leadership and teamwork skills. The educational objective of the Junior Leadership Conference is to increase the leadership skills and knowledge of youth across Louisiana. The Conference features a variety of workshops focused on leadership development, communication, teamwork, service learning and youth-adult partnerships. A key element of the Louisiana 4-H Junior Leadership Conference is youth driven focus. Youth decide what's offered, preside over the sessions and teach all the educational workshops. At the Louisiana 4-H Junior Leadership Conference, youth participants aren't only learning about leadership they are practicing

"The conference was great!" "I feel like I learned something about how to be a better leader and counselor! I look forward to serving my parish!" "It was amazing." "The conference was good! It taught me more about leadership skills." "This was a very good experience for me." "The conference was overall great. I met many people and learned how to enrich my

leadership." "This was an awesome camp!" ";The conference was fun and well-organized."
"I learned a lot and feel more comfortable about myself." "It was an enjoyable trip. It left me with an increased knowledge of leadership." "It made me a more selfless person, looking out for the good of the community." These comments about the State 4-H Junior Leadership Conference was shared on the evaluation.

As a result of participating in the State 4-H Junior Leadership Conference, youth participants indicated the following:
87% of the youth was motivated to expand their leadership role in 4-H.
85% of the youth were more energized about 4-H.
86% of the youth broadened their knowledge of leadership.
81% of the youth developed their leadership skills.
77% of the youth made me more confident in my leadership ability.
79% of the youth were motivated to expand their leadership role in their parish.
74% of the youth strengthened their communication skills.
84% of the youth was re-energized about 4-H.

Source of Funds

Louisiana 4-H Foundation and Louisiana Bankers Association

4-H Summer Camp Develops Life Skills

Mark G. Tassin, Karen Martin, Lanette Hebert, Debbie Bairnsfather, Lisa Arcemont, Jane Jones, Janet Fox;

4-H Youth Development

Key Theme: Leadership Training and Development

More than 4000 youth ages 9 to 12 participate in the 4-H summer camping program in a 10 week camping session. These youth represent every parish in the state of Louisiana. The curriculum developed for the camping program targets the development of life skills. The program is designed into five tracks: Outdoor Adventures, Food and Fitness, Nature and the Environment, Dramatic Arts and Technology. 4-H youth were able to choose the track that interested them and they remained in the track of choice for entire week. The camp is designed to be more than just a fun experience. 4-H Camp strives to develop a variety of life skills that include: social skills, learning to learn, teamwork, and self-responsibility.

The 4-H camping experience was redesigned in 2006 to target life skill development of 4-H campers. Five tracks were designed and curriculum developed that emphasized the experiential learning process. The intent in the design was to make the experience more interactive and hands-on and less lecture and classroom type situation. 4-H youth were allowed to select the track of their choice and remain there the entire time they were participating in camp. Professional staff was hired to serve as instructors and coordinators of each track. Staff member were elementary teachers and trained in the discipline they were to coordinate prior to camp. College staff members were hired as track instructors and trained. High school 4-Hers utilized as camp counselors were specifically trained in the areas that emphasized the development of the 4-H campers' life skills. To measure the effectiveness and impact of the camping experience a random sample of 5 campers per track at all 10 camps was selected. These 500 campers and their parent/guardian received a survey along with forms required for their consent to participate. The survey consisted of items related to all of the life skills targeted and quantitative data was collected using a Likert-type scale.

Camper Survey
Social
98% stated they met new people at camp they would like to stay in touch with
91% indicated camp helped them respect other people
89% agreed at camp they learned being different was alright
Learning to Learn
90% felt they were better able to learn and share what they learned
86% indicated they learned something new they planned to learn more about
82% agreed they learned the importance of paying attention
Teamwork

100% stated they did their share when working with other campers
96% indicated when they worked with others they finished the job started
88% agreed their way was not the only way to be successful
Self-responsibility
94% indicated they learned to complete jobs they were responsible for
94% learned the importance of being on time
86% felt because of camp they were more confident about themselves
"Because of 4-H Camp, I know I can do a lot more than I used to because I believe in myself."

Operation: Military Kids…Supporting Military Families in Our Own Backyard

Tanya Walker **4-H Youth Development**

Key Theme: Family Resource Management

Since 9-11, Louisiana has deployed more than 11,000 civilian service members to fight the global War on Terrorism. Total civilian service member strength in Louisiana tops 20,000. Families left behind during deployment have legitimate concerns regarding family finances, employment, and childcare. Even though the youth's family structure has changed due to deployment, the community may not recognize this change and this may have profound implications to the youth and family. Post-deployment may also create concerns about the service member's employment status and re-creating a pre-deployment family environment. While the youth may not relocate, their life is changed dramatically when a parent suddenly is mobilized or deployed and leaves the family for potentially dangerous assignments. Families of National Guard and Reserve Soldiers usually do not live on military installations but are dispersed throughout the state and are therefore isolated from other families and youth who are experiencing similar deployments and separations.

To provide support networks and to deliver recreational, social, and educational programs for military youth living in civilian and military communities, a two-day, one-night winter camp was held at Camp Grant Walker 4-H Educational Center. Operation: Military Kids Camp Lagniappe II was geared toward developing team-building, communication and networking skills through fun, hands-on, age appropriate activities. In addition, each camper received a Hero Pack, a symbol of thanks to the sacrifices they make when their parents are deployed. Operation: Military Kids (OMK) is a collaborative effort with America's communities to support ";suddenly military"; kids impacted by mobilization and deployment. The 4-H/Army Youth Development Project joins Army National Guard, Army Reserve, Boys and Girls Clubs of America, the Military Child Education Coalition, the American Legion, Schools, and other community organizations to build local community support networks designed to reach out to "suddenly military" youth before, during, and after their parents are deployed. OMK focuses on those young people whose parents are in the National Guard and Army Reserve who have been and/or continue to be deployed, who live away from other suddenly military families and away from normal military support mechanisms.

Thirty-seven children of the military participated in the weekend gathering at LSU AgCenter 4-H Camp Grant Walker. "Thanks, I had great fun and met other kids who move around a lot like me." "I had fun with the catapult; I learned that teamwork was the only way we could figure it out to build it and we had to work together to launch the balls." "Thank your 4-H members for my new backpack." These Hero Packs were part of a state-wide LSU AgCenter 4-H University Service Program designed to build awareness and foster civilian community support for our military youth. In addition, Hero Packs are a tangible expression of support to military youth and families. Hero Packs are backpacks filled by non-military youth with mementos and items designed to help connect kids with a deployed parent or loved one. They are a way to hand deliver a salute to military children and youth for their strength and sacrifices while parents are deployed. As a result of their participation in the OMK camp youth enhanced their communication, teamwork, problem solving, and interpersonal relationship skills.

Source of Funds

LSU AgCenter, CSREES/USDA (Cooperative State Research, Education, and Extension Service, US Department of Agriculture), US Army Reserve.

Regenerated Bagasse Cellulose Fiber

Yan Chen Human Ecology

Key Theme: Alternative Uses for Agricultural Products

The vision of the national biomass R&D sets a goal for biobased products that by 2010 production of chemicals and materials from biomass will be substantially increased to 12% of the current production of target U.S. chemical commodities [1]. Estimated current capacity of producing biobased products (diverse chemicals, ethanol, starch, sortbitol, soybased products, cellulose polymers, etc.) is about 12,500 million pounds (5% of the target U.S. chemicals and materials). Among that are 2,500 million pounds of cellulose polymers. USDA has listed the cellulose polymer as one of the 11 categories for biobased products [2]. It is reported that the U.S. thermoplastic market was increased from 77,640 million pounds in 2001 to 86,101 million pounds in 2004, with a compound growth rate of 2.6%. However, estimated current capacity of producing biobased products (diverse chemicals, ethanol, starch, sortbitol, soybased products, cellulose polymers, etc.) is only about 12,500 million pounds. The potential of expanding the production and use of the biobased products is huge.

An initial experiment in the conversion of raw bagasse into regenerated cellulose fiber was completed. A monofilament bagasse fiber was produced. The processing techniques used in this research had two major advantages. The regenerated bagasse cellulose fiber was compared to regenerated wood cellulose fiber and nanoparticle/cellulose fibers in terms of mechanical strength and elongation. The research results indicated that the tensile strength of the regenerated bagasse cellulose fiber was considerably lower than that of the regenerated wood cellulose fiber but the elongation seemed consistent between these two fibers. In terms of the monofilament fineness under the same condition of fiber spinning, the bagasse cellulose is also similar to the pure wood cellulose. The research result also showed that adding a small amount of the nano materials to compound with the celluloses would help increase the cellulose tensile strength but reduce the extensibility.
As one of the nation's sustainable biomass resources, the sugarcane industry is playing a strategic role in the technological development of producing bioenergy and biobased products. Sugarcane not only is a major feedstock for the production of bioethanol, but also produces a large quantity of the residue, bagasse, after sugarcane refining. Because the bagasse residue has an average cellulose content of 40%, there is a great potential to use bagasse as renewable raw material to produce cellulose polymers. The reported research is trying to demonstrate an efficient way to convert the waste bagasse into regenerated cellulose fibers with enhanced performance and potential for high-end applications. Industries' interest in the utilization of agricultural crops and residues for producing specialized renewable polymers is even stronger in the future. Apart from making cellulose fibers, the biobased cellulose polymers also can be used for manufacturing specialty film and mould materials.

Source of Funds

Governor's Biotechnology Initiative, Hatch and Multi-State, and LA EPSCoR.

Biology, Ecology and Management of Red Imported Fire Ants in Louisiana

Linda Hooper-Bui, Seth Johnson, Lane Foil, Dearl Sanders, Mike Chamberlain, Claudia Husseneder; Entomology

Key Theme: Integrated Pest Management

Red imported fire ants have become a serious human and animal health problem in Louisiana and across the southern U.S. They are highly invasive and have replaced native ant species across much of their introduced range. They have been implicated in the decimation of ground-dwelling wildlife, including game species such as bobwhite.
An experiment was designed to evaluate fire ant effect on ground-dwelling invertebrates, herpetofauna, birds and small mammals in two pine-dominated ecosystems. Hydramethylnon bait was used to suppress fire ants by up to 99% in experimental plots. Monitoring of fire ants in southern Louisiana following Hurricanes Katrina and Rita in 2005 showed that fire ant abundances were greatly suppressed or extirpated in flooded areas. Donations of Esteem Bait (Valent Corp) and assistance from the New Orleans Mosquito and Termite Control Board permitted distribution of Esteem bait to returning evacuees and treatment of large areas of unflooded levees and other high ground during summer 2006. LSU AgCenter and

New Orleans Mosquito and Termite Control Board personnel distributed approximately 4000 bags of Amdro; each bag treats eight average-sized yards.

Experimental suppression of fire ants in pine-dominated ecosystems demonstrated that fire ants may exacerbate bobwhite quail decline and may adversely affect skink and some ant populations, but had minimal effect on other ground-dwelling invertebrates, herpetofauna, birds or small mammals. Fire ant reestablishment in flooded areas of southern Louisiana was influenced by distance to unflooded areas and by human activity. Fire ants became reestablished following Hurricane Katrina more quickly in populated areas than in less populated, but similarly flooded, areas. Returning evacuees were provided free Esteem Bait to delay fire ant reestablishment in their neighborhoods. Approximately 32,000 homes were treated to suppress RIFA in New Orleans post-Katrina.

Source of Funds

Louisiana Legislative appropriation for fire ant research and extension, Valent Corp., and others

Noni Juice Specifically Purified to Fight Cancer Recurrence

Zhijun Liu **Renewable Natural Resources**

Key Theme: Nutrition & Health

In America, approximately 10 million cancer survivors are under the constant threat of cancer recurrence. An effective, inexpensive, minimal to none side effects product from food ingredients is ideal for cancer survivors to maintain cancer-free. Noni juice from a tropical plant fruit had the ingredients that could prevent cancer recurrence by inhibiting angiogenesis (new blood vessel formation). However, the anti-angiogenic ingredient in the fruit juice is so low that it is not effective at practical doses. Through the creation of ";Super Noni"; technology it is now possible to consume a practical amount to have an effect. This technology has now been licensed to Pacific Biotech for product development.

The LSU Agricultural Center made the initial discovery fly. The antiangiogenic activity of noni juice was initially discovered by LSU Health Sciences Center scientists but LSU AgCenter's participation pushed it to a practical and licensable "Super Noni" technology. Not only this technology transfer will bring royalty incomes to LSU AgCenter, but its impact to human lives can be immeasurable. Because of this technology, a company is now able to march towards developing a high-value product that has a high probability of working!

Source of Funds

LSU AgCenter Technology Transfer Fund

Compatibility of Shorebird and Waterfowl Management

Frank Rohwer **Renewable Natural Resources**

Key Theme: Wildlife Management

National surveys consistently suggest that bird watching is a major source of tourism dollars for states that have good birding sites. Louisiana certainly fits that bill due to the great winter weather and the abundance of both resident and wintering birds. Of particular interest to many birders are bird that breed in the grasslands. Grassland nesting birds has experienced the greatest population declines of any birds in North America and hence are a major conservation concern. Included in that set of birds are many temperate nesting shorebirds, such as Upland Sandpipers, Wilson Phalarope, Common Snipe, Willets and Marbled Godwits.

Like other birds, the primary concern for shorebirds is the amount of nesting habitat available to birds and the success of the nests. There is little management done primarily for shorebirds, but there is much management for nesting waterfowl. Nesting shorebirds may benefit from this management for ducks, yet there has been little evaluation. In particular it is not known if the reduction in the size of populations of medium sized nest predators (skunks, raccoons and foxes) will affect

shorebirds. Shorebirds might benefit because of reduced predation by these mammals. However, it is possible that predator reduction would allow populations of small mammals to expand, with detrimental consequences for birds, such as most shorebirds, that lay eggs small enough to be consumed by small mammals. To address these information needs, the habitat preferences for nesting shorebirds were quantified and compared to shorebird nest success on trapped and non-trapped blocks of habitat in North Dakota.

The habitat at nest sites (n= 315) was characterized for shorebird and then at random sites in fields with shorebird nests. Two habitats (pastures and field of dense nesting cover) were examined that were either Waterfowl Production Areas or fields enrolled in the Conservation Reserve Program. Shorebirds selected more sparse nesting sites when they nested in dense nesting cover. However, when shorebirds nested in pastures the cover at nest sites did not differ significantly from the rest of the field. Shorebirds also preferred to nest in native vegetation and showed a significant avoidance of exotic invasive species like leafy spurge, thistle, and smooth brome.

Mayfield nest success for shorebirds was substantially higher than for nesting waterfowl. Moreover, nest success did not differ between trapped blocks (nest success = 50.8%) and non-trapped control blocks (nest success = 69.1%). The appearance of a higher nest success on the non-trapped sites was caused by a difference in habitat

Reduction of medium sized mammals on township sized blocks of habitat has recently emerged as a very effective way to increase waterfowl production. This study suggests that there a no negative effects of such predator reduction for nesting shorebirds. The information on habitat selection by nesting shorebirds will help managers plan for a mosaic of cover types when they are restoring habitats. The emphasis for such habitat restoration will continue to be the dense nesting cover that is preferred by ducks. However, field always have low lying habitats that cannot support the exotic brome, wheatgrass, and legumes that comprise most dense nesting cover. Soils that will not support dense nesting cover often will support lower growing native plants that make excellent nesting cover for shorebirds. The US Fish and Wildlife Service funded this research because they needed to learn the habitat preferences for shorebirds so they could integrate shorebird habitat management into their ongoing waterfowl habitat.

Source of Funds

Delta Waterfowl Foundation

What Do Louisiana and Mississippi Non-Industrial Private Forest Landowners Think About Forest Certification?

Richard P. Vlosky, Priyan Perera, Michael Dunn, Glenn Hughes; Renewable Natural Resources

Key Theme: Forest Resource Management

Certifying the forests owned by NIPF landowners is an issue which has been given less attention over the years and as a result, these groups are generally underrepresented in certification.

This study was designed to determine how well NIPF landowners understand forest certification, as well as the amount of money they may (or may not) be willing to spend to become certified. We surveyed 2400 randomly selected NIPF landowners in Louisiana and Mississippi, with 1,200 landowners from each state.

About 40 percent of the respondents believe certification is necessary on private lands. However, the landowner's lowest level of agreement is with certification on private forestlands. Respondents believe certification in US is more an issue promulgated by environmental NGOs rather than a demand driven process. Higher number of neutral responses to questions that examined the landowner knowledge on certification suggests that majority have little knowledge on certification. Private landowner organizations and approved professional foresters are the most trusted entities by NIPF landowners to administer forest certification. Results also suggest that respondents are generally not averse to having certifiers monitor their forest management activities, however, majority (77 %) are unwilling to bear the cost of certification themselves. From the results, it is evident that cost of certification continues to be a main certification issue. Voluntary certification programs often ask landowners to bear the costs of certification. In general, small landowners face higher per acre costs for forestry certification. A majority of NIPF landowners participated in the survey are not willing to pay this extra cost. Although many cited timber

production as the primary reason for owning forestlands, they are not properly managed to generate maximum output. This is bolstered from the fact that majority do not have written management plans for their properties. Certification programs should look in to possibilities to reduce the cost of certification. This study will assist small landowners in understanding opportunities and challenges in participating in certification.

Source of Funds

Sustainable Agriculture Research and Education (SARE)

A Regional Comparison of Scholarship and Service in Cooperative Extension

Richard P. Vlosky, Michael Dunn; Renewable Natural Resources

Key Theme: Extension Scholarship & Service Assessment

There is a new line of inquiry into what is scholarship and how Extension contributes scholarly work to the academic body as a whole. Combined with new demands for different methods for learning as well as new technologies for teaching and extending knowledge beyond a university's traditional boundaries, this has lead some land-grant universities to re-configure how the Cooperative Extension Service at their institution is organized and how Extension faculty are evaluated in terms of job performance and productivity.

We surveyed U.S. Extension professionals on their employment experiences and personal perceptions about scholarship and service. Further, we segmented the results by U.S. census region to identify similarities and differences between regions. Overall, 75 percent or more of respondents from all four regions said that they are expected to exhibit scholarship as part of their job although an average of 50 percent across regions said that scholarship has not been clearly defined to them by their institutional administrators. There were also significant differences between regions in what respondents believe constitute scholarship for many of the activities presented to them. This gap is likely causing dissonance in Extension employee ability to perform to established (but not clearly articulated) standards. This is further complicated by respondent perceptions in all regions that they get rewarded more for scholarship than service but their consistent opinion that service gives them a much greater sense of accomplishment and satisfaction. We suggest that both Extension employees and Extension administrators should be ";on the same page"; with regard to expectations and performance goals and objectives.

Source of Funds

Louisiana Forest Products Development Center

U.S. Home Center Retailer Attitudes, Perceptions and Behaviors Regarding Forest Certification

Richard P. Vlosky, Priyan Perera, Michael Dunn, Glenn Hughes; Renewable Natural Resources

Key Theme: Forest Products Management

After single-family housing construction, repair and remodel applications of wood sold primarily through home center retailers accounts for the second largest demand market. It is critical to survey this population as home centers have been the primary driver of certification from the demand side of the equation in the United States. Major wood products retailers, specifically Lowe's and Home Depot, have committed to providing ";certified forest products"; to consumers. Home Depot's Wood Purchasing Policy states in part that "the Home Depot will give preference to the purchase of wood and wood products originating from certified well managed forests whenever feasible." It is unclear which of the five major certification systems will ultimately be accepted by major forest products retailers. This study can help wood products industry and certification providers to better understand the home center perspective of certification and, subsequently, make cogent decisions in positioning certified products and services in this sector.

In this study, we surveyed the top 500 home center retailers in the United States to ascertain their participation in certification, perceptions of current and future forest certification trends, as well as certification systems they deem acceptable and preferable. We determined trends in home center certification strategies, certification systems under

consideration, and other related trends in the home center arena.

Results from the study better frame certification-related issues from the perspective of wood products retailers looking for the best way to market and sell their products. In addition, results can help non-industrial forest landowners understand demand for certification and develop strategies to participate in certification.

Source of Funds

Sustainable Agriculture Research and Education (SARE)

Internet-based Information Technology Adoption: A Comparison between the US Forest Products Industry and other Industry Sectors

Richard P. Vlosky, Sanna Kallioranta; Renewable Natural Resources

Key Theme: Forest Products Management

The U.S. forest products industry went through a major globalization and restructuring process in the 1990s including several mergers and acquisitions followed by mill shutdowns and overall reduced capacity. The loss of manufacturing infrastructure, combined with rapidly increased foreign competition and imports from markets with lower manufacturing and operating costs for timber, furniture, and fiber products, have brought uncertainty and pressure to change in many sectors of the forest industry. Adoption of Internet technologies is one way for the forest sector to compete.

A study was conducted of a cross-manufacturing industry sample to explore Internet adoption and success in the U.S. forest products industry in comparison to other U.S. industry sectors that are lead adopters in Internet-based exchange technologies. The findings show that, relative to non-forest industry respondents, forest products industry respondents adopted Internet technology later and are using it less in their business functions. Results also show that forest products industry respondents have been less effective in appropriating value from customers by using the Internet. Forest products companies can use the information from this study to improving customer relationships and generally understand how the Internet can provide competitive opportunities.

Source of Funds

Industry

Thermoplastics Composites Reinforced with Wood/Natural Fibers and Inorganic Nano-Particles

Qinglin Wu, Craig Clemons, K. Lian, and Yong Lei; Renewable Natural Resources

ey Theme: Biobased Products

Agricultural production in the country (e.g., sugar and rice) generates a significant amount of biomass, which consists of high quality lignocellulosic fibers. Disposal of these agricultural byproducts is so far still inefficient. As a result, how to deal with these fibers has been a significant problem for rural residents. The United States generate more than 25 million tons of plastics in the municipal solid waste (MSW) stream a year. The plastic waste is not only polluting our waterways and seas, it is also beginning to take a toll on wildlife. Due to a continuing proliferation of plastic resin types, additives, barrier layers, and colors, the recycling industry cannot sort out all the contaminates - making more and more plastic simply waste. Combining waste plastics with wood/natural fibers to produce high quality industrial products (e.g., extruded building material) provides a prospective solution for value-added utilization
The major effort has been made to find technologically feasible and economically acceptable solutions of using natural fibers and commingled waste plastics. Studies have been conducted to achieve the following objectives:

1. To establish thermal-mechanical processing parameters of natural fibers, recycled plastics, and additives;
2. To establish advanced production technology for manufacturing natural fiber polymer composites through chemical coupling, nanoparticle reinforcement, reactive extrusion, and manufacturing process optimization;

3. To establish composite performance properties through developing state-of-the-art testing technology; and
4. To transfer the developed technology to industry for commercial production, and to enhance education outreach by involving university students to participate in the proposed research.

US sales of wood/natural fiber plastic lumber used in construction are experiencing double-digit growth and should reach $3.1 billion by 2008. This research effort at LSU Ag Center will lead to the development of new technology for manufacturing thermoplastic composites reinforced with wood/natural fibers and inorganic nano-particles. The research is using the latest technology in composite development and interface analysis to deal with phase incompatibility and composite brittleness, which are some of the predominant challenges in manufacturing natural fiber and plastics composites. Technical development on new coupling agents and coupling forms for commingled plastics, composite strengthening through nano-particles, and advanced extrusion techniques represents the technology of the era.

Several folds of energy saving can be achieved by using natural fiber reinforced composite materials in comparison with synthetic materials. The products made of natural fibers can be relatively easily burnt at the end of product life to recover energy, compared with glass fiber reinforced composites. Most of the agricultural product producers are located in rural areas, thus the industry plays a significant role in stabilizing rural economics and maximizing economic contribution of the natural resources. By recycling their byproducts and using them to create bio-based composites, value will be added to the crops and will stimulate rural economic development. The use of previously discarded byproducts, use of renewable resources, use of materials that are not derived from petrochemicals can help provide a cleaner, healthier environment for citizens in the country. In summary, the technology developed from this project can lead to improved energy efficiency, significant rural economic development, and great environmental benefits.

Source of Funds
Louisiana Board of Regents` LEQSF Industrial Tie Program
USDA/DOE Biomass Research and Development Program

STAKEHOLDER INPUT

The LSU AgCenter regularly seeks stakeholder input on all research and extension education programs in order to maintain a focus on clientele needs and that its research and extension programs are delivered in a timely manner and have value and impact. During the programming year the LSU AgCenter placed emphasis on its Advisory Leadership System, which has as its primary goal that all research and extension education programs of the LSU AgCenter are: (1) effective in meeting the needs of stakeholders; (2) being delivered in a manner that makes them accessible to all people; and (3) constantly assessed for relevance to ensure that they maintain current. Regional Leadership Advisory Councils were added to the overall advisory system in 2002, in accordance with structural changes that were made in the AgCenter. These regional councils, comprised entirely of stakeholders, provide valuable service to the Regional Directors regarding how the LSU AgCenter can improve service to stakeholders in the region by marketing the AgCenter and its programs and identifying issues within the eight regions of the state. In the FY 2006 program year, all eight of the AgCenter regions conducted Advisory Council meetings with a total of about 110 stakeholders participating

Issues identified through the state-wide advisory structure that the AgCenter will continue to address during the coming year include: (1) research and extension focus on providing continued assistance to hurricane-ravaged parishes; (2) more effective marketing of AgCenter programs; (3) the need for public education regarding production agriculture; (4) increased partnerships and collaboration between the AgCenter and businesses, agencies, and organizations; (5) the future of extension in regard to staffing and maintaining a local presence throughout the parish; (6) the future of Louisiana agriculture; and (7) issues regarding rural/urban interface.

Research and extension faculty work closely with all major commodity associations, i.e., cattle producers, rice producers, cotton producers, sugarcane producers, grain producers, the Louisiana Farm Bureau Federation, family and community development associations, 4-H youth associations, and other groups to get input and guidance on AgCenter programs. These organizations not only give guidance but also support many of the AgCenter programs with monetary and physical assistance. Input and direction from these organizations and the entire stakeholder structure are the lifeblood of the LSU Agricultural Center.

Another dimension of obtaining stakeholder input for research and extension programs are the Agricultural Center Exchange (ACE) groups which meet in conjunction with the AgCenter Annual Conference. These groups cover all of the economically important commodities produced in Louisiana as well as environmental, value-added, family, youth, economic, and nutrition issues. Each session is attended by all AgCenter scientists and extension faculty (both parish-level and state-level) with programs in the respective subject-matter areas. Stakeholder input into research projects is provided by extension faculty, who bring a state-wide perspective of the highest priority needs and researchable problems. In turn, extension faculty are better able to understand the research perspective and status of progress on various on-going projects. Of considerable value is the camaraderie which has developed between research scientists and extension field faculty, many of whom did not know one another very well prior to the implementation of the ACE groups. Our human nature is to work better with people who we know, and because the ACE concept has allowed AgCenter faculty to have more contact with one another, the organization functions more efficiently and effectively.

Research Section

Louisiana Agricultural Experiment Station scientists and administrators continued to meet regularly with a number of stakeholder groups. A representative but not comprehensive list of some these commodity meetings is shown of pages 90-91. The generalized forum for these stakeholder sessions is a series of presentations of research findings and proposed research projects delivered by scientists directly to the stakeholder panels. This is followed by questions and discussions led by stakeholders, which provide focus, direction, and specific suggestions that are incorporated into the respective research projects.

On a broader dimension, Louisiana Agricultural Experiment Station scientists and administrators participate each year in the Louisiana Farm Bureau Federation annual meeting. This is the predominant agricultural organization in Louisiana, representing the entire spectrum of agriculture, natural resources, youth, and policy issues of concern in the state. Beyond the general sessions, scientists and administrators participate and interact directly in commodity advisory committees, which are constituted by stakeholders and provide another vital feedback opportunity relative to research needs and recommended directions.

Extension Section

The Louisiana Cooperative Extension Service 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 agriculture, 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 issues and concerns needed to be addressed for a better future for parish residents. Based on the forums, LCES developed a state-wide strategic plan focused on 12 initiatives: After-school Education and 4-H Adventure Clubs; Economic Development; Master Farmer; Water Resource Management; Waste Management; Coastal Restoration; Environmental Horticulture; Family Financial Management; Farm Financial Management; Leadership and Volunteer Development; Nutrition, Diet and Health; and Parenting and Child Care. Parish extension faculty reported to their stakeholders the outcome of the forums, including strategic plans to address the identified issues. Initiative teams of extension faculty (parish and state) then developed action plans and curricula to enable parish agents to conduct educational programs in the identified subject-matter areas.

A follow-up to the initial focus forum, conducted in the 2003-2004 program year, was essentially a second round of meetings with stakeholders in every parish in the state. These forums were strategic planning sessions. Issues identified in the original focus forums were re-visited, with implementation progress reports presented by extension faculty regarding these issues. Additionally, stakeholders were asked for input on other issues of concern in the parish, and these concerns were included in the parish Plan of Work.

Stakeholder input also included a segment of parish program reviews, which were initiated in 2003. The reviews are conducted by a team of extension faculty housed outside the parish, for the purpose of reviewing on-going educational programs, recognizing program excellence, and recommending programming change if need be. As one part of the review, stakeholder focus groups are conducted in the three programming areas of agriculture, family and consumer sciences, and 4-H youth development. Results from the stakeholder focus groups are included by the review team in submitting the parish program review summation. As of the FY 2005 reporting year, parish program reviews have been conducted throughout the state. Hurricanes Katrina and Rita postponed parish program reviews in the fall of 2005, but reviews were renewed in 2006.

Additionally, parish extension faculty continued to involve clientele in the traditional commodity and subject-matter advisory committees, in order to receive input on needs and problems, which could then be addressed in local education problems. From a state perspective, extension state-level faculty engaged representatives of their commodity or subject-matter area to gain input on stakeholder issues, needs, and problems.

MERIT REVIEW
Meetings with Stakeholders - (1998 – 2006)

Cotton Support Committee:	March 18, 1998 March 17, 1999 March 14, 2000 March 13, 2001 September 10, 2002 September 10, 2003 September 14, 2004 August 31, 2005 **September 12, 2006**
Rice Research Board:	October 28, 1998 December 16, 1999 December 14-15, 2000 November 12-13, 2001 November 21, 2002 November 18, 2003 November 16, 2004 June 30, 2005 December 15, 2005 **June 29, 2006** **November 14, 2006**
Soybean and Grain Research & Promotion Board:	December 1-2, 1998 December 8-9, 1999 November 30 – December 1, 2000 November 28-29, **2001** November 19-20, 2002 November 20, 2003 November 18-19, 2004 November 10-11, 2005 **November 16-17, 2006**
American Sugarcane League:	February 3, 1998 February 4, 1999 February 23, 2000 January 28-29, 2001 February 19, 2001 January 28, 2002 February 19, 2003 February 25, 2004 February 23, 2005 **February 22, 2006**
Louisiana Beef Industry Council:	May 5, 1998 October 14, 1999 October 10, 2000 October 11, 2001 January 11-12, 2002 December 13, 2003 December 16, 2004 June 27, 2005 **November 27, 2006**

Meetings with Stakeholders – (1998 – 2006) - 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 September 21, 2005 **September 19, 2006**
Louisiana Crawfish Promotion and Research Board:	August 10, 1999 July 17, 2001 February 12, 2002 May 9, 2002 May 28, 2003 June 16, 2004 April 13, 2005 **May 10, 2006**
Louisiana Sweet Potato Commission:	June 11, 1998 June 17, 1999 June 14, 2000 June 13, 2001 May 22, 2002 June 19, 2003 July 23, 2004 January 12, 2005 **January 10, 2006**
Louisiana Farm Bureau Federation:	July 3, 1999 July 15, 2000 July 12-15, 2001 July 10-12, 2002 July 12, 2003 July 8-11, 2004 July 5-9, 2005 **July 6-9, 2006**

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 4-H Youth Development on March 5-9, 2006 and a review of statewide research and extension programs in Aquaculture was held on May 30—June 2, 2006. Each review was conducted by a panel consisting of CSREES leaders and research/extension peers from other universities. The focus of each review was directed toward the future roles of research and extension professionals working in an integrated manner to address Louisiana's needs in the respective program 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 45 project reviews were conducted which led to the establishment of approved projects with initiation dates during the reporting period 10/01/05 to 9/30/06. Following the established policy, review comments were solicited from peer scientists and extension specialists and the comments and a synthesis of recommendations were provided to the originating scientist by a member of the LAES administrative team. The changes made in the proposed project by the originating scientist were then reviewed at the LAES administrative level prior to final project approval.

EVALUATION OF MULTI-STATE ACTIVITIES

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 2006, LAES scientists were active participants in 46 approved multi-state projects. Of these 46 projects, 19(40%) 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 other 27(60%) were Southern region-based projects. The 46 projects address each of the five national goals. To further reflect the LAES support and involvement, scientists' travel expenses to annual technical committee meetings are currently being supported from administrative funds. Finally, to further indicate involvement and support, LAES Directors currently serve as administrative advisors to 7 active multi-state research projects.

Extension Section

The evaluation of multi-state activities has been beneficial in identifying ongoing activities and opening up new opportunities for collaboration between extension/research faculty, thus strengthening the overall cooperative effort. 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 between Louisiana, Arkansas, and Mississippi on digital diagnostics, pesticide applicator training, and limited-resource management programs for young families continues. A tri-state collaborative agreement among Arkansas, Mississippi, and Louisiana began in FY 2004. The agreement included three program areas in four Delta counties in each state: Workforce Preparedness, Master Farmer program, and the Tri-state Community Development Initiative. Additional multi-state programmatic linkages occurred via the regional forester, master wildlife, and regional water quality programs. In addition, extension state faculty participated in the Southern Extension Research Association (SARE) exchange groups, the Southern Agriculture and Natural Resources committees, and numerous regional and national meetings. These exchanges provide extension faculty in different states new ideas and materials, and establish collaborations with counterparts that result in more effective and innovative programs not only in Louisiana, but in other contributing states as well. The economic development of the LCES has been greatly enhanced by collaborative work with the Mississippi-based Southern Rural Development Center, as well as the Foundation for the Mid-South, also located in Mississippi. The LSU AgCenter has taken an active role in rural economic development by establishing in 2004 the Delta Rural Development Center (DRDC). The mission of the DRDC is to enhance economic opportunities for people in the Delta. DRDC provides executive education programs for boards of any type, management teams in public and private organizations, assistance with grant writing, and other services. The LSU AgCenter is committed to helping people in the rural areas of the Louisiana Delta overcome poverty and other barriers to economic development. The establishment of the DRDC marks a new hands-on strategy to begin the difficult task of improving economic conditions in the Delta region.

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 at the point of local program delivery.

In this way new competencies are brought to both extension and research clientele. This administrative approach includes placement of specialists at experiment stations around the state. Joint appointments continued to be made in FY 2006, and the joint appointment approach continues to be of value in accomplishing the mission of the LSU AgCenter.

Several "Summits" have been held over the last two years. Summits are in-house program reviews, essentially strategic planning sessions, attended by all subject matter faculty related to the program area being assured. Often, Summits follow CSREES program reviews and where appropriate are attended by multi-unit faculty from both on-campus departments and off-campus research stations. Extension field agents with major responsibility in the program area also attend the Summits. A faculty member from the AgCenter's Organization Development and Evaluation unit usually serves as the facilitator at Summits. The format is the identification of research and extension needs, followed by the development of an action plan. Summits are held in a retreat environment to remove participants from their daily work place and create a better setting for concentration on strategic planning. Administrative support for the Summits has been substantial. AgCenter Summits held in FY 2005 included: Biological and Agricultural Engineering; AgCenter Communications unit; Horticulture; AgCenter Information Technology unit; Aquaculture; and Biotechnology. In FY 2006, a Summit was held by the Agricultural Economics and Agribusiness Department.

Research and extension faculty continued to work closely to develop joint publications, coordinated research, and conduct educational programs. Concerted efforts have been made to improve communications between research and extension personnel so as to provide improved and rapid service to clients. Special initiatives such as water quality, fire ants, Formosan termites, the Master Farmer Program, the Master Gardener Program, the Master Cattle Producer Program, and the Master Horseman Program are being jointly conducted by extension and research faculty.

Each year, research and extension faculty (including field faculty) meet in AgCenter Exchange Groups (ACE). Researchers update extension faculty on the latest research projects and results, and extension faculty in turn share their educational programs and the issues and problems their clientele are facing for researchers to review and consider in their research agendas. In addition, teams of research and extension faculty meet in discussion groups two-to-four times a year to update one another on the current research and education programs.

In the plant sciences area, research and extension faculty meet each year to review research and make recommendations on new varieties, fertilizers, pesticides, and other cultural practices which subsequently form the management practices recommended to farmers.

The LSU AgCenter continues to rely on the AgCenter Faculty Council to provide rapid response and feedback to administration and increased communication and participation in policy to faculty. The Council includes 20 elected representatives proportional to faculty rank and divided between "on-campus" and "off-campus." Off -campus members include researchers and extension agents located throughout the state. Administration has worked closely with the Council, has accepted Council recommendations for increased participation of faculty in vice chancellor and department head reviews, and has seriously taken into consideration Council viewpoint in helping to guide administrative perspective.

INTEGRATED ACTIVITES

Projected costs and returns for numerous Louisiana commodities were developed and/or updated and provided to farm management faculty. These "production budgets" are used cooperatively with extension agents and specialists and presented at producers meetings, often held in January and February. Among the crops covered are catfish, crawfish, beef, dairy, broilers, forages, cotton, soybeans, corn, grain sorghum, wheat, rice, sugarcane, and commercial vegetables.

Crop Genetics/Variety Trials/Variety Recommendations

Variety trials were conducted on corn, wheat, soybeans, rice, cotton, warm and cool season forages, sweet potatoes, and sugarcane. Trial results are published and provided to producers, seed dealers, and extension specialists/agents. Researchers participate directly with extension specialists as the varieties recommended for planting are being selected. Both research and extension faculty initially become involved in outreach activities in variety recommendations through participation in parish (county) agent training sessions and commodity producer meetings, held widely throughout the state.

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 faculty, crop consultants, and producers at seasonal producer meetings and through direct contact. Research scientists participate directly with extension faculty to prepare insect control recommendation guides which are used extensively throughout the extension system in educational activities.

Plant Health/Treatment Recommendations

When extension faculty encounter plant health diagnosis problems they are assisted by research scientists. The scientists involved conduct applied research activities on the efficacy of disease preventing agents and are active in providing assistance in the formulation of disease-preventive agents used by extension faculty in educational programs.

Food and Agricultural Biosecurity

Following the 9/11 attack, the state's agricultural community and government officials immediately sought to address future terrorists 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, a state-wide conference was held to help make farmers and ranchers more aware of the problems that could arise from the introductions of plant or animal diseases or pests into their operation. The conference was a forum for participants to interact and exchange ideas with leading biosecurity and agrosecurity experts and key policy makers from Louisiana and the nation. The LSU AgCenter continues to monitor research and action on the federal and state level, in order to contribute to and stay abreast of issues and techniques in the fight again terrorism, particularly in regard to food and agricultural biosecurity.

Food Processing/Packaging/Safety

Research and extension faculty interact to develop food safety procedures and deliver food processing and food safety information. Extension faculty conduct HACCP training sessions, with participation and assistance from research scientists. A Muscle Food Laboratory is jointly used for research studies and extension demonstrations. Food Science Department research and extension faculty for the fourth consecutive year have conducted a Food Processing Conference, with 180 attending in FY 2005. The conference serves to address timely topics in (1) economics and marketing and (2) technology and business issues. Included in the conference for industry participants were both plenary and break-out sessions.

The conference was not held in 2006 due to the hurricane.

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. Parish agents are heavily involved in the delivery of the fertilizer recommendations to the farmers.

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 remain the highest priority areas. Research scientists teamed with extension faculty to prepare the waste management sections for BMP manuals used in extension outreach programs

Master Farmer Program

The Master Farmer Program is a joint educational effort of research and extension that allows agricultural producers to be proactive and address environmental challenges using researched-based best management practices. The program's goal is the development of environmental stewardship as both a mindset and a practice of Louisiana farmers. A numerous group of agencies collaborate and cooperate extensively—in both planning and implementation—with the LSU AgCenter on this well-received educational program, some of which include USDA – Natural Resources Conservation Service; Louisiana Farm Bureau Federation; Louisiana Department of Environmental Quality; Louisiana Department of Agriculture and Forestry; Louisiana Department of Natural Resources; Louisiana Soil and Water Conservation Districts; National Oceanic and Atmospheric Administration; and state-wide producer associations, including rice, sugarcane, cotton, and cattle. To-date, more than 2100 producers have completed the program or are presently enrolled in 2006.

Master Cattle Producer Program

The Master Cattle Producer program was designed and implemented by LSU AgCenter research and extension faculty, with collaboration and cooperation, both in program planning and delivery, with agencies and associations including the Louisiana Cattleman's Association, USDA-Natural Resources Conservation Service, and the Louisiana Farm Bureau Federation. The program curriculum includes both animal management and marketing, with specific stress on environmental stewardship. In accordance with this emphasis on the importance of environmental concerns, the participants are required to take the first phase of the Master Farmer Program, which is composed of eight hours of classroom presentations on environmental stewardship. As of FY 2006, over 510 Louisiana cattlemen have graduated from the program.

Master Horseman Program

The Master Horseman Program was designed and implemented by LSU AgCenter faculty to provide a comprehensive, in-depth educational program for horse-enthusiasts state-wide. The curriculum, composed of eight sessions, includes both classroom and hands-on instruction. Teaching faculty included both research and extension professionals from the Department of Veterinary Science and the Department of Animal Science. Although coordinated by state extension faculty, parish-level extension faculty members also teach in the classroom setting and conduct hands-on sessions. Parish horse associations, working in conjunction with parish faculty, help to promote and coordinate the program. A total of 19 programs have previously been held, and 281 participants completed the program. In FY 2005, five additional programs were held, with 77 horse enthusiasts participating.

Master Gardener Program

Louisiana's Master Gardener program has provided intensive training to serious gardeners for the past 13 years. This is a state-wide voluntary program that strengthens the LSU AgCenter leadership and education in the area of consumer horticulture. The program consists of two parts: horticulture classes are taught by AgCenter faculty, other university faculty, and industry representatives. Upon completion of the course, graduates are asked to perform a minimum number of voluntary hours and continuing education hours annually to maintain their certification. Volunteer hours are varied and meet local parish needs. They include among others a wide variation such as working with school and 4-H youth, nursing home residents, hospital patients, garden shows, and answering gardening-related phone calls in local parish extension offices. Presently there are 21 on-going programs in 48 Louisiana parishes, which represent 96% of the state's population centers. The program has recently trained 381 new volunteers, increasing the active number of master gardeners to 1,420. These volunteers have provided 39,043 hours of their time to LCES educational programs. This volunteer service translates to a

$917,226 benefit to the people of Louisiana. The program nationally has a retention rate of 30%, but Louisiana enjoys a 72% retention rate. The program allows extension to "extend" education to an ever-increasing gardening audience and better meet the demand for information on horticulture.

Pest Management

Parish 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 included integrated activities engaged in by research and extension professionals in entomology, weed science, and plant pathology. These educational venues highlight integrated (research and extension) activities conducted throughout the year, and by their nature are multi-function academic activities.

Asian Soybean Rust

In May 2004, in anticipation of the arrival of Asian soybean rust in the U.S., LSU AgCenter research and extension faculty began work on a Louisiana Response and Action Plan. This planning process, conducted over a five-month period, was primarily a joint effort by the LSU Department of Plant Pathology and Crop Physiology research and extension faculty, although agriculture-related agencies were kept informed. The purpose of the plan was to outline pre- and post-confirmation of the establishment of Asian soybean rust. The document served as guide for detection, response and management of this destructive disease. The dreaded disease was first discovered near Baton Rouge, Louisiana on November 6, 2004 by an LSU AgCenter plant pathologist, and confirmed by USDA scientists as the first identification in North America. It was extremely fortunate that the discovery was made in late 2004, because it gave precious time for training sessions by land-grant university faculty for growers, consultants, and soybean industry personnel. The agricultural chemical industry was able to ramp up production of fungicides for possible use in the coming 2005 crop year. Perhaps the most significant development arising from the original discovery of Asian soybean rust in Louisiana was the establishment of sentinel plots in all soybean producing states. During the 2005 season, the disease was first found in February, near Tampa, Florida. It then spread sparsely through the Southeastern states, but in general the soybean industry was given a reprieve in 2005. This gave time for state and federal plant pathologists to refine the nationwide sentinel plot program and to evaluate fungicides for control of Asian soybean rust and for other foliar diseases in Louisiana. Because of the unprecedented preemptive measures taken by LSU AgCenter pathologists and their counterparts in other Gulf states, the soybean industry has greatly improved its position in striving to cope with the dangerous Asian soybean rust. In 2006, one industry representative stated that the Louisiana soybean industry is probably one of the most informed in the country because of the efforts of the Louisiana Asian Soybean Rust team, spearheaded by LSU AgCenter faculty.

West Nile Virus

In 2002, the threat of mosquito-borne diseases was aggressively addressed by the LSU AgCenter. The mosquito web site was established in May 2002, and became a popular resource site, with comprehensive information on West Nile virus and other mosquito-borne diseases. In June 2002, a conference was held, raising awareness and providing research scientists, extension educators, and the media a means to assure that the best available material was provided to the general public. The West Nile Virus has abated, but AgCenter faculty members continue to stress the importance of mosquito abatement as the first line of defense. At this point, most of our population has been exposed to West Nile virus, and most horses have been vaccinated or have developed natural immunity. The probable outlook for the next few years is for the virus to be a somewhat minor problem for both humans and horses, but AgCenter research and extension faculty continue to be on guard against this health risk.

Hurricanes Katrina and Rita

The LSU Agricultural family still hurts deeply from both hurricanes Katrina and Rita., which came ashore in 2005. Many Extension agents and research scientists lost their homes. Initially, four parish offices were closed , with three of these now reopened. Valuable research at experiment stations was compromised. At the onset of the hurricanes, AgCenter faculty continued to serve our stakeholders. During FY 2006, this service has continued full-force. Though much progress has been made in the hurricane ravaged part of Louisiana, a great deal of effort will continue to be needed in the future to provide even a semblance of its pre-hurricane status. Below are a few of the measures taken by the LSU Agricultural Center to assist the people of Louisiana.

Flooding of low-lying rice fields in Southwest Louisiana during Hurricane Rita in 2005 has resulted in persistent accumulations of high levels of soil salts more than one-year after the event. In some fields, salts remain elevated to such an extent that they are not suitable for production in the 2007 season. AgCenter scientists conducted field and greenhouse studies to determine the behavior of salts in representative soils. To remediate fields where salts were retained, a protocol was established based on lab and field testing. The field was flooded after a rain, the field was then water-leveled and flood water discharged after five days. After one flushing, salts in the field were sufficiently reduced to suggest a rice crop would be successful.

Both hurricanes Katrina and Rita deposited a considerable amount of salt throughout the coastal parishes of the sugar belt of Louisiana. A survey taken shortly after the water ebbed reveled soil salinity levels in several levels of 6 to 8 times the published damage threshold. Three methods were used to evaluate the effects of sol sampling on sugarcane production. the first approach was to monitor changes in salinity with time and rainfall, and determine yield at the original survey site. Secondly, microbiological-based products, designed to reduce soil salinity, were evaluated. The last method was to sample partially flooded fields to compare salinity and yield levels between the submerged and non-flooded areas of the fields.

In dealing with the devastating effects of hurricanes Katrina and Rita on the beef and dairy industry in the state, it was realized that pertinent information in printed format was desperately needed. Pertinent information gathered from multiple sources was combined with first-hand experience of LSU AgCenter faculty into a series of fact sheets and publications. The educational material contained in the compilation of fact sheets provided beef and dairy producers with the most critical information needed to prepare for and mitigate the effects of disasters involving their livestock. Being better prepared for and able to minimize the effects of a disaster curtails the economic impact to livestock producers.

An AgCenter publication , titled Use Preservative-Treated Wood When Rebuilding After a Hurricane, was distributed to over 10,000 occupants along the Gulf coast.. Moreover, the publication was accessed also through the AgCenter web site. Using treated wood will help ensure the long-term durability of a the house in this high-risk decay zone.

Prior to the hurricanes Katrina and Rita, the Coastal Area Research Station was named the Citrus Research Station. About 75% of the citrus trees were removed within a few months of the storm, and many more are dying. The primary research area currently envisioned for the Coastal Area Research Station is development and evaluation of salt-tolerant coastal plants. As a side-effect of the two devastating hurricane, the new mission of the station will help producers and researchers to deal with the disasters that led to its establishment.

Hurricanes Katrina and Rita caused an unprecedented amount of home damage and displaced hundreds of thousands of Louisiana coastal residents, and the region’s recovery is hampered by a lack of inhabitable housing, financial ability to rebuild or restore, and severe labor shortages and price hikes. The AgCenter LaHouse demonstration, in mid-construction with its hazard resistant features exposed, was open to the public and media as an educational resource following the storms. Among other feature of LaHouse in 2006, a Rebuild Safer, Stronger, Smarter Homes educational outreach program was launched , involving collaboration and support from the U.S. Department of Energy and additional corporations and associations.

Thirteen Louisiana Master Gardener Extension Volunteer Programs representing 30 parishes (almost half of the state) were directly impacted by Hurricanes Katrina and Rita. The LSU AgCenter, in cooperation with the Louisiana 4-H Foundation, developed a Master Gardener Hurricane Relief Fund to help rebuild their programs and communities. The results of the effort resulted in $11,000 collected and awarded. Fifteen projects received funding in eight parishes. In addition a number of parishes received donated horticulture publications to reestablish their parish Louisiana Master Gardener libraries.

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: __X__ Multistate Extension Activities
_____ Integrated Activities (Hatch Act Funds)
_____ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	**Actual Expenditures* FY2006**
Farm Financial Management	93,599
Food Safety	32,054
Master Horseman	96,163
Master Farmer	153,260
Natural Resources Management	142,241
Parenting Education	369,507
Poultry	116,678
Rice	641,088
Soybeans	133,907
Total	1,778,497

Paul Coreil, Director — 3/26/07 Date

*Expenditure from federal budget (Smith-Lever 3 b,c) in FY 2005 was 12.4.% of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .124 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.

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Multistate Extension Activities and Integrated Activities

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State: Louisiana

Check one: _____ Multistate Extension Activities
_____ Integrated Activities (Hatch Act Funds)
__X__ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	**Actual Expenditures* FY2006**
Farm Financial Management	866,547
Food Safety	120,204
Master Horseman	70,119
Master Farmer	183,912
Natural Resources Management	142,241
Parenting Education	246,338
Pasture, Forages, and Wheat	163,958
Poultry	291,695
Rice Production	160,272
Soybeans and Grain Production	156,225
Total	2,401,511

Paul Coreil, Director

3/26/07
Date

*Expenditure from federal budget (Smith-Lever b,c) in FY 2006 was 12.4% of total Cooperative Extension budget (state and federal). Multi-state (total) and multi-function (total) dollars multiplied by .124 to determine share of Smith-Lever funds attributed to multi-state and multi-function work.

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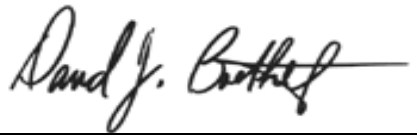
Check one: ____ Multistate Extension Activities
__X__ Integrated Activities (Hatch Act Funds)
_____ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures FY2006
Farm Production Budgets/Market Economics	$161,969
Crop Genetics/Variety Trials/Variety Recommendations	$152,883
Insecticide Efficacy/Insecticide Recommendations	$319,267
Herbicide Efficacy/Herbicide Recommendations	$178,922
Plant Health/Treatment Recommendations	$162,306
Food Processing/Packaging/Safety	$33,561
Animal Health/Treatment Recommendations	$56,845
Soil Testing/Fertility Recommendations	$42,808
Animal Waste Management	$48,704
Well-being of Rural Low Income Families	$8,624
Natural Resource Economics & Mgmt.	$24,471
Ag Engineering & Audubon Sugar	$25,496
Aquaculture	$5,738
Total	$1,221,594



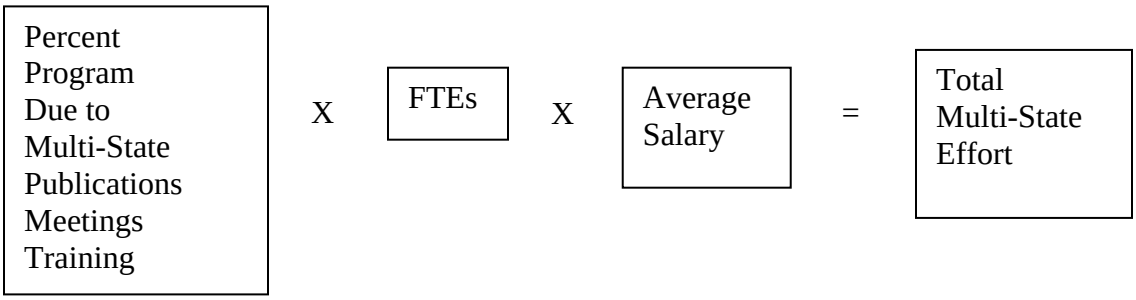
David J. Boethel, Director

3/26/07
Date

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 state faculty assist with agent and producer training in the surrounding states, and those efforts are expanding continually. Additionally, all of the recommendations and educational programs are researched-based, and research faculty are used extensively in developing recommendations, publications, agent-training, and producers meetings.

To determine multi-state work, each extension state faculty member estimated the percentage of material, ideas, or programs that were obtained from other states through publications, meetings, and other avenues of contact. The percent multi-state effort was multiplied by the number of FTEs devoted to the program times the average salary per FTE.



The calculations indicate 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 was used for multi-function (integrated) work, involving both research and extension faculty working together in a coordinated effort toward a common goal.

The reports for multi-state and multi-function are included in the body of the report. The total multi-state and multi-function activity and the federal funds accounted for are listed below:

	Total	**Federal Portion Accounted For**
Multi-State Activity	1,778,497	220,534
Integrated Activity	2,401,511	297,787

Total LCES Expenditure from Smith-Lever $ by Federal Goal

Federal Goal	Total LCES expenditure from from Smith-Lever $
1	1,001,636
2	63,198
3	598,299
4	162,766
5	1,484,667

Total Research Scientist Years and Federal Formula Funds Expended by Federal Goal

Goal	SYs	Federal Formula Funds $
1	3.1	$33,063,605
2	8.9	$2,837,923
3	2.4	$1,130,430
4	9.8	$3,947,697
5	5.0	$1,674,114