

2013 University of Arkansas at Pine Bluff Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The School of Agriculture, Fisheries and Human Sciences administers the 1890 research and Extension programs at the University of Arkansas at Pine Bluff (UAPB). The School consists of three academic departments, Agriculture, Fisheries and Human Science. Federal, state and private funds of approximately 11 million (both federal and extramural) supported 115 ongoing projects with most of the research projects conducted at the UAPB campus site, and some activities occurring at the UAPB Lonoke and Marianna farm sites. Additional studies were conducted on private cooperating farm sites in Jefferson, Lee, St. Francis, Monroe and Phillips counties and with other institutions such as the Felsenthal National Wildlife Refuge.

Three new Evans-Allen research projects were approved and two Evans-Allen projects were completed. The knowledge gained by these research activities were extended to families and communities through a variety of outreach and Extension programs. The extension program has structured programs in 29 counties with staff housed in 10 counties.

Research and Extension in Agriculture are conducted in the areas of plant science, animal science and agricultural economics. The efforts in the Department of Human Science are directed toward human nutrition, food safety and family life. A newly developed project in the textiles program includes the utilization of new applications for biomaterials such as traditional fibers and new modified regenerated proteins like spider silk and cellulosic fibers in relation to aspects of sustainability of materials.

The Agriculture and Human Science components of the Research and Extension programs are designed to provide information and assistance to small-scale and limited resource farmers and disadvantaged families and youth. The Aquaculture/Fisheries program supports both the state's aquaculture industry and recreational fishing as an avenue for enhancing tourism as an economic engine for the state. Research and Extension in Agriculture are conducted in the areas of plant science, animal science, natural resources and agricultural economics. The efforts in the Department of Human Science are directed toward human nutrition, food safety, family life and textiles.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	23.5	0.0	21.3
Actual	0.0	21.6	0.0	26.8

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- External University Panel
- Expert Peer Review

2. Brief Explanation

Our research and Extension programs are monitored annually through a performance appraisal system that assures adherence to planned goals. Each department in the school of Agriculture, Fisheries and Human Sciences has an internal peer review system that evaluates research proposals prior to their implementation. A peer review panel process is in place to review extension publications and internal research publications. The performance appraisal system is also used to assign credit for published papers, fact sheets, manuscripts, funded grants, presentations, contacts, output and outcomes.

External review of the Agriculture Department was conducted during the fall 2011 and concluded in fall 2012. One of the suggestions for the review was that the Department should develop an advisory board for review of academic programs. Although there is an advisory board for research and Extension program, none exists for academic programs. The Regulatory Science Program which is a component of the Agriculture Department, is scheduled for external review in the fall of 2013.

The Regulatory Science Center completed a program self study report in 2013. The Regulatory Science Center is scheduled for external program review in 2014. The Department of Human Sciences has completed an accreditation self-study report for the Council for Accreditation of the American Association of Family and Consumer Sciences (CAAFC), and received a site visit during the Spring 2012 semester. As a result of this process, the Department of Human Sciences received re-accreditation for a ten year period which will expire in the fall 2022. The Department's next self-study report to CAAFC will be due September 1, 2021. A self-study for accreditation for the Didactic Program in Dietetics Education was completed in 2011. Accreditation for the program is pending, contingent upon two students graduating the program on or before the end of 2014; at least four students are scheduled to graduate the program before the end of this time period. The child development center was re-accredited by the Arkansas Department of Human Services/Division of Child care and Early Childhood during 2011.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder individuals

Brief explanation.

The Research Director/Dean of the School of Agriculture, Fisheries and Human Sciences was made permanent in September 2012. The Director used the formal stakeholder input developed by the Agriculture Research & Extension Council and the Aquaculture-Fisheries Center of Excellence Advisory Committee as external advisors for the School's extension and research programs. He also evaluated the makeup of these two stakeholder groups for effectiveness in the input process. Both stakeholder groups are providing meaningful suggestions for programmatic improvements. The Agriculture Research and Extension Council has met during both the summer and winter of 2013.. It is scheduled to meet again summer of 2014.

The UAPB Aquaculture/Fisheries Center (AFC) receives input and interacts with stakeholders on an almost daily basis with personnel in the Center. Individual farmers, representatives of trade associations, and board members interact frequently with Center Researchers and Extension specialists. The interaction often is initiated with a request for some specific type of information. The specific questions often expand into broader discussions as the state of knowledge in particular areas through which additional research needs become readily apparent. For the natural fisheries research and Extension areas, the primary stakeholder defined for the UAPB Aquaculture/Fisheries Center is the Arkansas Game and Fish Commission (AGFC). The increased interaction with the Arkansas Game and Fish Commission in recent years has facilitated greater communications.

Formal input is obtained through the representation of the Arkansas Game and Fish Commission on UAPB'S National Aquaculture/Fisheries Advisory Council. Additional opportunities for interaction and input are available at the statewide meeting of the Arkansas Chapter of the American Fisheries Society (AFS). Many AGFC managers and biologists attend these meetings. Also, the increasing involvement of Center scientists on committees of the Southern Division of the AFS and at the national level provide opportunities for additional input because a number of AGFC personnel continue to be active in those settings.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Open Listening Sessions
- Use Surveys

Brief explanation.

Stakeholder input is a core component of all 1890 research and Extension programs. Means for acquiring input varies depending upon the nature of the research or Extension program and the diversity of relevant stakeholders. These include local and state agencies, community groups, producers and other targeted audiences, as well as business and industry groups. Producer meetings, advisory groups, conferences, and focus group discussions are major means for gaining input. Our stakeholder input process is structured individually by departments/schools to represent the differences in audiences served. This approach is taken because the clientele's needs for research and Extension assistance in programs other than aquaculture are broad in scope, local in nature and geographically limited. While the Aquaculture Program provides research and Extension support for all aquaculture producers in the state, other programs support under-served and diverse audiences.

The Agriculture Research and Extension Advisory Council (AREAC)

The AREAC was originally organized in 2003 to add structure to the stakeholder input process for Research and Extension programs in agriculture. The Council formally meets once a year, but members have recently requested at least two meetings each year. Members are also in continuous contact with research and Extension faculty and administrators on a less formal basis. The AREAC was re-organized in 2010 with only slight changes in the membership structure that would allow the Council to be more responsive to the research and Extension needs of the Agriculture and Human Sciences Departments. Members will serve on the Council for a three year rotating basis. Membership includes seven (7) producers engaged in a variety of agricultural enterprises (i.e. alternative crops, row crops, livestock, etc.) one (1) retired Extension professional (from 1862 system) two (2) federal agency (NRCS, FSA) representatives, four state agency (Arkansas Department of Environmental Quality, Rural Development, Arkansas Land and Farm Development, and Arkansas Natural Resources Commission) representatives and two (2) industry (Monsanto,

Delta Yams) representatives. The broad based representation of Council membership provides a broadened perspective of challenges facing producers and promotes the creation of partnerships to address the challenges.

The Aquaculture-Fisheries Center of Excellence Advisory Committee

The primary advisory committee that provides feedback and input into the UAPB Aquaculture/Fisheries Program is the National Aquaculture/Fisheries Advisory Council. It includes representation from catfish, baitfish, and sport fish farms, feed mills, Arkansas Game and Fish Commission, U.S. Fish and Wildlife Service, and other state university programs. Some committee members also serve as representatives for other state and national aquaculture industry organizations, so that these individuals contribute a much broader perspective to advisory committee meetings than their formal capacity might otherwise suggest. At the 2011 Advisory Committee meeting, recommendations included continued work on new feed formulations, marketing structures, cash flow and financial management, diseases, new chemicals approved for non-food fish, new hatchery techniques for public stocking programs, and more training for AGFC biologists. The Chicot County Extension programs derive their input from this committee's advice. Lonoke County gain stakeholder input into program development from these meetings. The Lonoke County Agricultural Office, operating as part of the 1862 State Extension Service also hosts an annual advisory committee meeting. UAPB Aquaculture/Fisheries Center staff is invited to participate in these meetings to facilitate information transfer between the 1890 Cooperative Extension Program, the 1862 State Extension Service and industry members.

In addition to the National Fisheries Advisory Council, there are a number of advisory subcommittees that specialize in specific areas and meet regularly to contribute towards the Aquaculture/Fisheries Center's program planning and development. These include the UAPB Facilities Subcommittee, the Catfish Subcommittee, and the Lonoke Aquaculture Subcommittee.

Members of the Facilities Subcommittee meet on a regular basis to plan UAPB Aquaculture/Fisheries Center facility expansion and develop resources for new facilities. The Catfish Subcommittee meets twice a year and the Lonoke Aquaculture Subcommittee meets once a year to plan the annual UAPB Lonoke Aquaculture workshop, which is primarily focused on bait and ornamental fish aquaculture.

The Young Scholars Advisory Committee Structure

A Young Scholars Task Force, including some of the children and parents enrolled in the program, oversees the planning, implementation and evaluation of the program in both counties.

One of the children serves as chair of the task force while another child serves as secretary. In addition to program parents and children, membership includes representatives of partnering agencies, governmental, officials, and state legislators. Our specialists in agriculture, family and community programs work with 1862 county agents, as requested, to organize clientele groups through community-based organizations, schools and the faith-based community. Both research and Extension programs in Aquaculture/Fisheries and in Agriculture and the Family and Consumer Sciences Extension program utilize an advisory committee structure as a major component of the stakeholder input process. The Human Sciences Research program employs other mechanisms to obtain stakeholder input.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals

Brief explanation.

Informal input from stakeholders is presented and discussed at formal meetings with research faculty and staff. Strategies are developed to address identified concerns as appropriate. Faculty are represented on all structured committees for purposes of participating in the discussion and gathering the input from stakeholders that will later be presented back to faculty and staff. An example of input from a structured committee currently being implemented is an evaluation of fall green planting dates initiative in 2011 and plans to develop and install a commercial kitchen for evaluation of value added processing of vegetables and fruit. The commercial kitchen is currently under construction and will be available for use by mid-summer 2013.

The most recent stakeholder meeting resulted in suggestions by the group for conducting research that will provide a foundation for introducing additional herbicides for weed control in sweetpotato production. Both graduate research projects and a faculty research program have been developed to address this stakeholder issue. Conversely, an individual stakeholder suggested that the research we currently conduct with straight head disease in rice was not important for our clientele. This is an instance where the Director must weigh the comments of the individual with the needs of the overall state and other agricultural clientele. Other suggestions included holding additional meetings each year during Agriculture Field Days, and taking care not to shift a disproportionate amount of the attention to the new foundation sweetpotato seed program to the detriment of other 1890 agricultural programs.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- In the Action Plans
- To Set Priorities

Brief explanation.

The input from stakeholders has been incorporated into outreach efforts with sweetpotato outreach programs and enhanced technical support for value-added processing with various agricultural commodities. The most recent stakeholder meeting resulted in suggestions by the group for conducting research that will provide a foundation for introducing additional herbicides for use in sweetpotato production. Both graduate research projects and faculty research programs have been developed to address this stakeholder issue.

Brief Explanation of what you learned from your Stakeholders

Input from stakeholders through the agricultural Extension agents and program assistants in the field continue to play a major part in program development. Farmers and packing house operators continue to voice the need to support growing sweet potato production in Arkansas. Sweet potato research was expanded in the area of product development and the Extension program has given increased attention to farmer production problems.

The Aquaculture-Fisheries Advisory Committee continues to give input for the research and Extension programs. This year the Committee focused on the continued development of the Ph.D. program in Aquaculture-Fisheries and the economic plight of producers in the region. The Committee strongly supported the development of this graduate program because of the direct impact it would have on the research and Extension.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	1709245	0	2088859

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	1874471	0	2229297
Actual Matching	0	1624767	0	1810130
Actual All Other	0	0	0	0
Total Actual Expended	0	3499238	0	4039427

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover				
	0	278973	0	220788

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Families, Youth and Communities
2	Food Safety
3	Climate Change
4	Global Food Security and Hunger
5	Childhood Obesity
6	Food Safety in Aquaculture
7	Sustainable Energy

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Families, Youth and Communities

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being		55%		100%
806	Youth Development		45%		0%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	1.3	0.0	0.0
Actual Paid Professional	0.0	1.3	0.0	0.4
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	289183	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	297191	0	25737
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Four focused programs were addressed in the Families, Youth and Communities Program. These included the **Arkansas AG Adventures and Awareness Program, 1890 Nutrition Education Program, Teens on the Go, and the Young Scholars Program**. The **Arkansas AG Adventures and Awareness Program** was implemented in the southeastern region of the state for students in elementary through high school. Activities consisted of field days at the University of Arkansas at Pine Bluff Small Farm Outreach and Water Management Center, camps at the Arkansas 4-H Center, exhibits, and displays at educational fairs and conferences, community and classroom workshops, in multiple locations throughout the state. Students participated in planned hands-on activities involving taking and identifying soil samples, conducting experiments with soils on how to improve it for agriculture and forestry production, scouting for insects, planting and maintaining field crops, learning the history of agriculture, and surveying with GPS. The **1890 Nutrition Education Program** was implemented in Jefferson County for low-income adults and youth, because the 1890 Extension Program had no nutrition presence in Jefferson County. Jefferson County rates high in nutrition related diseases such as diabetes, high blood pressure and obesity. The 1890 **Expanded Food and Nutrition Education Program (EFNEP)** and the **Families First-Nutrition Education and Wellness System (FF-NEWS) Program**, a SNAP-Ed project, are implemented in the Delta Region of the state, Cross, Woodruff and Phillips counties. **Teens on the Go** is a newsletter that was developed for students in grades 7-12. Students received 6 issues of the newsletter during the school year. This is the 34th year the Extension Family and Child Development Specialist, (Dr. Irene K. Lee), has developed the newsletter. Topics for 2013 included: 1) Words Can Hurt; 2) Head of the Class-- Treat Your Teacher Well; 3) Lost in Love: Keeping True to You When You're One of Two; 4) Tangled Web: The Intersection of Sexuality, cell phones, e-mail, and the Internet; 5) The Power and Peril of Cults; and 6) My Name is Eric and I'm an Addict. The **Young Scholars Program** was implemented in a housing project in Monroe County, located in the Delta Region of the State. This is the 17th year for the program. The children, referred to as **Young Scholars**, met 5 days a week, year-long, in an after-school program that emphasized math and science skills. Parents enrolled in the **Young Scholars Program** met weekly in small groups and focused on the curriculum for the children, as well as on parenting education, stress management, coping and job related skills, family relationships, and economic-and self-sufficiency skills.

2. Brief description of the target audience

The target audiences included students in elementary through high school and home schooled children and youth, teachers, counselors, Extension agents and families in Arkansas, Jefferson, Lonoke, Monroe, Pulaski, White, and Prairie counties (Arkansas AG Adventures and Awareness Program), students in grades 7-12, state-wide (Teens on the Go), low-income, minority children and their families who live in a housing project (Young Scholars Program, Monroe County), and low-income adults and youth in Jefferson County (1890 Nutrition Education Program).

3. How was eXtension used?

Some Extension faculty members used eXtension for subject matter up-date.

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	501	570	4450	60585

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	6	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- The number of participants in these programs will include direct and indirect contacts with youth and adults.

Year	Actual
2013	66521

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	To increase performance in school (Young Scholars Program), help students develop decision-making skills (Teens on the Go), help families gain economic security (parents enrolled in the Young Scholars Program), improve the ability of low-income adults and youth to make healthful food choices (1890 Nutrition Education Program), and to increase understanding and awareness of agriculture as a scientific discipline with many career opportunities (Arkansas AG Adventures and Awareness Program).

Outcome #1

1. Outcome Measures

To increase performance in school (Young Scholars Program), help students develop decision-making skills (Teens on the Go), help families gain economic security (parents enrolled in the Young Scholars Program), improve the ability of low-income adults and youth to make healthful food choices (1890 Nutrition Education Program), and to increase understanding and awareness of agriculture as a scientific discipline with many career opportunities (Arkansas AG Adventures and Awareness Program).

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	64962

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Public officials, educators and the public in general continue to express concerns about the well-being of children and their families. The well-being of children are linked to the communities in which they live. In Arkansas 7.6 percent of children live in severely distressed communities. These children have some tough odds to overcome.

What has been done

Several high-impact programs of long duration have been implemented. The Young Scholars Program in its 17th year is reaching the entire family. Teens on the Go is celebrating its 34th year. The children in the Young Scholars Program are referred to as Young Scholars. They met in an after-school program 5-days a week year-long. They were taught math and science skills using agriculture and human sciences subject matter.

Results

In the Young Scholars Program, program leaders have seen a major transformation in the children and families. The children have improved in school attendance and performance. Many are either enrolled or have finished college. Students credit Teens on the Go as teaching them valuable lessons in life, including decision making skills.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The slow economy affected the Young Scholars Program. As families lost jobs many moved away. This affected enrollment and attendance. The 1890 Nutrition Education Program was a short-term program that was implemented in Jefferson County because of the high rate of nutrition-related diseases reported in the county.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

There are 52 children and 38 parents enrolled in the Young Scholars Program. Evaluation of the Young Scholars Program indicates that a high percentage of the children have made the honor roll and all have passed the bench-mnark tests .Many of the families credit the money management phase of the program with helping them learn to control debt and improve their financial situation. Seeing the success of their children, some parents have completed the GED, others have enrolled in the community college, some have graduated, and one has finished the University of Arkansas at Pine Bluff.

Students had an opportunity to evaluate Teens on the go. One student wrote this: "Teens on the Go is a great way to help teens deal with difficult situations in life. Teens on the Go taught me to do the right thing. Teens on the Go are helpful way in teaching students like me valuable lessons in life."

Key Items of Evaluation

Evaluation of the Young Scholars Program indicates that a high percentage of the children have made the honor roll and all have passed the Bench-mark tests.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Safety

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies		1%		20%
502	New and Improved Food Products		10%		20%
503	Quality Maintenance in Storing and Marketing Food Products		88%		20%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins		1%		40%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.3	0.0	0.7
Actual Paid Professional	0.0	0.4	0.0	0.7
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	81772	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	63573
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The objective of this study was to determine the effect of edible coatings on microbiological quality of fresh cut sweetpotatoes stored at 4°C for up to 14 days. Freshly cut sweetpotatoes were treated with 1% chitosan and 1% hydroxypropyl methylcellulose. Sweetpotatoes without edible coating were considered as control. The microbiological quality of fresh-cut sweet potatoes were evaluated under modified atmosphere packaging in low O₂ permeability bags flushed with gas composed of 2% O₂ and 5% CO₂ with a balance of N₂ or air packaging in high O₂ permeability bags containing ambient air during 14 days at 4°C. Packages were sampled during storage to determine the effects of sanitizer washing treatment on the microbial load. Aerobic plate counts and yeast and mold counts were determined using standard procedures, by plating appropriate dilutions of homogenates on plate count agar and potato dextrose after incubation of 48 h at 37°C and 5 days at 25°C, respectively.

2. Brief description of the target audience

Local farmers and limited resource farmers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	15	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Three abstracts and three presentations at the scientific annual meetings. Three peer reviewed publications. Three presentations and/or workshops to farmers.

Year	Actual
2013	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase number of small farmers and producers who adopt UAPB's Fresh-Cut Processing Technology and utilize it for market development of their fresh-cut produce.

Outcome #1

1. Outcome Measures

Increase number of small farmers and producers who adopt UAPB's Fresh-Cut Processing Technology and utilize it for market development of their fresh-cut produce.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

Brief Explanation

No natural disasters affected outcomes during the 2013 time period.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Sweet potatoes coated with chitosan showed slower increase of aerobic plate counts and yeast and mold counts than the ones coated with hydroxypropyl methylcellulose and uncoated control samples regardless of packaging methods during storage. This study indicated that fresh-cut sweetpotatoes coated with chitosan maintained aerobic plate counts and yeast and mold counts 1-2 logs (10 to 100 times) lower than hydroxypropyl methylcellulose coated fresh-cut sweetpotatoes during storage regardless of packaging methods. Aerobic plate counts of all samples reached to 6.5-8 log CFU (Colony Forming Unit)/g on day 14 at 4°C, whereas yeast and mold counts reached 4-5 log CFU /g. Aerobic plate counts of chitosan coated fresh-cut sweetpotatoes in modified atmosphere packaging were 0.5 log lower than those in air packaging after 14 days of storage. Chitosan coating helped to maintain bacterial counts in fresh-cut sweetpotatoes at least 1 log less than hydroxypropyl methylcellulose coating or control during 14 day storage at 4°C regardless of gas composition in packaging bags.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
133	Pollution Prevention and Mitigation		50%		33%
134	Outdoor Recreation		50%		0%
135	Aquatic and Terrestrial Wildlife		0%		33%
307	Animal Management Systems		0%		34%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.5	0.0	0.5
Actual Paid Professional	0.0	1.7	0.0	0.9
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	155248	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	92485	0	171573
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Compile beginning and ending water quality measurements associated with swine waste treatment lagoon.

Compile beginning and ending water quality measurements associated with constructed wetland cells and varied aquatic plants.

Compile water quality measurements associated with the UAPB Demonstration Farm pond.

Develop hill-slope runoff model output for the farm watershed using the APEX model (similar to EPIC).

Conduct at least one Swine Waste Treatment System Outreach/Demonstration Meeting each year.

Conduct at least one Farm Water Quality Improvement Outreach/Demonstration Meeting each year.

Complete one peer reviewed research article every two years. Complete one fact sheet every year

. Document the number of small, local and limited resource farmers that have been assisted with swine waste treatment, odor and/or water quality issues each year.

A range of activities will be conducted in support of this program, particularly in the areas of: 1) evaluating effects on wild largemouth bass of hatchery-reared bass in small impoundments; 2) understanding factors associated with successful sportfish stockings in Arkansas waters; 3) on-farm herbicide trials; and 4) extension programming related to control of aquatic weeds.

On-farm herbicide trials will be conducted using both pre-emergence and post-emergence herbicides. Results will be disseminated through meetings, a newsletter, fact sheets and a presentation for agent use. Fact sheets on nutrient management for small impoundments and on interpreting water testing results will be revised.

Information on managing these resources will be disseminated directly to the general public, through county offices, and through natural resource agencies. Proper identification of problematic aquatic plants is essential, and this service is provided to the general public. Activities include direct contacts with the general public, indirect contacts through county extension faculty, fact sheets, freshwater aquaculture eXtension content, newsletter articles and presentations at meetings and workshops. Radio interviews reached a wider audience across rural America. A wide variety of educational activities are utilized in this program, however, reaching a major segment of the target audience still requires individual contact for effective implementation.

Data logging devices have been installed in commercial fish farms across the state. Continuous monitoring of water temperatures will provide a basis for developing a comprehensive database of changing water temperatures.

Youth fishing and aquaculture education is a continuation of a long standing program. UAPB has a youth fishing trailer which contains enough rods and reels and other type fishing gear for 80 or so youth to fish at the same time. UAPB makes the trailer available to 4-H or other interested youth groups by reserving the trailer. Assistance is provided through extension to maintain the fishing trailer and gear in a good state of repair and assist with youth fishing derbies on request.

Wild age-1 largemouth bass abundance will be determined in July 2012 using the Petersen method. Boat-mounted electrofishing in littoral areas will be used exclusively to collect fish. Age-1 largemouth bass should be effectively sampled using standard boat-mounted electrofishing methods (Jackson and Noble 1995). Thus, it anticipated that other gears will not be needed to collect representative samples of age-1 largemouth bass. Wild age-1 largemouth bass collected during the first sample period will be given a different color VIE tag than the June 2011 mark and released. A census will occur 2-7 d after the first sample period. Collected fish will be counted as tagged or tagless, length (TL; mm) and weight (g) recorded, and scales removed in length classes where age overlap is expected. The Chapman modification of the Petersen method will again be applied to provide estimates of wild age-1 largemouth bass abundance.

Daily instantaneous mortality rates will be calculated in each impoundment by regressing the natural log (loge) of wild largemouth bass population abundance on the natural log of the sampling day. The first

sampling day is loge [June 2011 capture date] and the second sampling day is loge [July 2012 capture date]. The slope of the regression will be the daily instantaneous mortality rate. One-way analysis of variance (ANOVA) will be used to compare mortality of wild age-1 largemouth bass among impoundments stocked with different densities of hatchery-reared largemouth bass. For all ANOVAs, $\alpha=0.05$ and $H_0=$ no difference. Tukey's HSD test will be used to determine significant differences between treatment levels if H_0 is rejected by ANOVA. Habitat and biotic factors measured during sampling may be used as covariates if high variation is encountered. Principal Component Analysis may also be used to examine variability among systems due to uncontrollable habitat and biotic sources of variability. Axes scores for each impoundment would be used as covariates in ANOVA to examine effects of stocking density on condition and vital rates of the 2011 year class of largemouth bass.

Growth will be determined for wild largemouth bass in each impoundment. The change in mean length from 2011 to 2012 will be divided by the number of days between the two periods to estimate growth rate (i.e., mm/d). Growth will be compared among treatment levels using one-way ANOVA. Relative weights of age-1 largemouth bass will be used as an index of condition. Relative weights will be calculated for the July 2012 census and compared among treatment levels using one-way ANOVA.

In the first phase of this planned research, largemouth bass will be emphasized because they are the most sought-after sportfish in Arkansas. AGFC's Largemouth Bass Management Plan (LMBMP: AGFC 2002) specifies that rates of recruitment, growth, and mortality are poorly known for many Arkansas waters. More recent work done with largemouth bass since 2002 has provided information from the Arkansas River, but information is scarce for many of the state's other lakes (e.g., those < 3,000 ha without large seasonal flow variation). Better understanding of natural recruitment processes for largemouth bass will shed light on factors important in understanding and identifying waters with better prospects for largemouth bass stocking success.

For the first study, twenty (20) lakes will be selected for assessment in conjunction with AGFC biologists. These lakes will represent those covered under the current LMBMP, and will contain largemouth bass populations with known or suspected poor, moderate, and high recruitment. This judgement will be based on any historical data that may exist for the lake and input from the respective district biologists. Thus, work in 2012 will focus on coordinating with AGFC to identify the lakes to be included in the study and compiling historical data on each.

2. Brief description of the target audience

The target audience includes but is not limited to small, limited resource landowners, underrepresented communities, and families.

The target audience is small impoundment owners, commercial fish farmers, and natural resource managers. Many of the impoundments are less than 1/2 - acre, are located in rural areas, and are owned by a broad cross-section of the general public in terms of income, education and other socio-economic factors.

Additional targets would include 4-H and youth groups.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	620	100	32	0

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Complete one peer reviewed research article every two years.

Year	Actual
2013	0

Output #2

Output Measure

- Document the number of small, local and limited resource farmers that have been assisted with swine waste treatment, odor and/or water quality issues each year.

Year	Actual
2013	3

Output #3

Output Measure

- Complete one fact sheet regarding water quality, swine waste management or environmental stewardship each year.

Year	Actual
2013	0

Output #4

Output Measure

- Number of project annual and final reports

Year	Actual
2013	1

Output #5

Output Measure

- Number of presentations and scientific meetings

Year	Actual
2013	2

Output #6

Output Measure

- Number of abstracts published

Year	Actual
2013	0

Output #7

Output Measure

- Number of refereed journal articles

Year	Actual
2013	0

Output #8

Output Measure

- Number of research reports submitted to stakeholders

Year	Actual
2013	0

Output #9

Output Measure

- Number of non-peer reviewed publications

Year	Actual
2013	0

Output #10

Output Measure

- Number of extension articles

Year	Actual
2013	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	The number of conservation practices utilized by swine farmers as a result of this project is an outcome measure.
2	Increase awareness of environmental issues and policies that pertain to operating small swine farms.
3	Owners and managers of aquaculture ponds, small impoundments and reservoirs that benefited from aquatic weed cases
4	Database of changing water temperature in commercial fish ponds in Arkansas
5	Effects of urban development on water quality and ecosystem health in Mississippi Bayous
6	AGFC biologists will use information on hatchery fish influence on wild fish to inform decisions regarding stocking enhancement
7	Use of information to support the management used towards the largemouth bass fishery in the Arkansas River
8	Number of research recommendations transferred to AGFC staff
9	Percent of AGFC fisheries biologists that are informed about the study results
10	Number of non-agency fisheries biologists that learned what we know
11	Number of stakeholders gaining access to the economic analysis of alternative climate change adaptation and mitigation policy
12	Number of AGFC fisheries biologists and managers that use study results to address management issues
13	Provide science-based information to resource managers that increases understanding of largemouth bass dynamics and enhances largemouth bass management in Arkansas waters
14	Provide science-based information to guide management decisions regarding stocking of hatchery-reared sport fishes to enhance wild fisheries in Arkansas waters

Outcome #1

1. Outcome Measures

The number of conservation practices utilized by swine farmers as a result of this project is an outcome measure.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Both individual farmers, adjacent land owners and society in general care about the management of small swine farmers in their community.

What has been done

Demonstrations have been developed and displayed at farm field days and farm tours.

Results

The conservation practice has been demonstrated to both the target and non-target public.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Increase awareness of environmental issues and policies that pertain to operating small swine farms.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small, limited resource landowners, underrepresented communities, and families. These clientele groups are typically the ones which own and operate small swine farms in the south.

What has been done

Demonstrations have been developed and displayed at farm field days and farm tours. Fact sheets have been developed to help disseminate the environmental issues.

Results

The conservation practice has been demonstrated to both the target and non-target public.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #3

1. Outcome Measures

Owners and managers of aquaculture ponds, small impoundments and reservoirs that benefited from aquatic weed cases

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Arkansas has over 6000.000 acres of ponds and lakes, and 9,700 miles of streams and rivers. All of these water acres are suitable habit for unwanted aquatic vegetation. At times, these water resources can be rendered unusable for their intended purpose due to weed problems. This results in hundreds of requests for assistance and the expenditure of untold thousands of dollars and man hours in attempts to control nuisance plants. Misinformation, poor planning, and improper application methods leads to wasted money and effort, and poor results in aquatic plant management.

What has been done

For the past seven years, in-service training for county extension agents has been conducted on aquatic plants and nuisance algae. For the past three years, demonstration projects have been conducted on fish farms to explore ways to retard the growth of nuisance plants, minimizing chemical use and the expense of treatment.

Results

The use of low rates of the herbicide fluridone have proven effective at control submersed plant growth when added at the time of pond filling. Other chemicals have been tried, but so far the results have been disappointing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

Outcome #4

1. Outcome Measures

Database of changing water temperature in commercial fish ponds in Arkansas

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Losses to warmer or colder water temperature due to climate change have seemingly increased over the last decade. Water temperatures that are unusually high can cause disease outbreaks in fish. Infectious and environmental diseases have a major impact on commercial aquaculture and are important in private ponds and in natural fisheries. This is the first long term monitoring study of aquaculture ponds in Arkansas.

Baitfish and sportfish farmers reported unusual fish losses exceeding 7,000 water acres in Arkansas. Primary species affected included fathead minnows, golden shiners, and bream.

What has been done

Temperature data loggers have been deployed in 18 aquaculture ponds throughout the central, northeastern and southeastern portions of the state. Data from the loggers are downloaded approximately every three months and stored.

A study was conducted to determine the extent of predation on small baitfish by lesser scaup. A migratory bird scientific collection permit was obtained from the Arkansas Game and Fish Commission and the U.S. Fish and Wildlife Service to collect 200 lesser scaup. Scaup are being collected in the field and will be brought back to the lab. Scaup will be dissected to identify quantity of fish consumed and the species of fish consumed will be identified. Five laboratory trials were conducted over the winter months (12-13 week trials) at the Lonoke Fish Disease Laboratory to evaluate the impact of three feeding regimes (1x/week; 2x/week, and 1x/month) on fish growth, survival, respiration, and lipid composition at a constant low temperature of 45 degrees Fahrenheit. Fathead minnows, hybrid bluegill, hybrid crappie, native bluegill, and redear sunfish will be utilized in the study.

Results

Currently, we have 4 years worth of continuous temperature data.

These studies are currently ongoing and no results are available at this time.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #5

1. Outcome Measures

Effects of urban development on water quality and ecosystem health in Mississippi Bayous

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Human activities especially agricultural development can largely affect water quality and aquatic ecosystem health. Agriculture is one of the biggest issues in the Mississippi River Basin. These agricultural activities are causing water use (e.g., irrigation) and potential environmental problems (e.g. eutrophication).

What has been done

Dr. Yushun Chen's group at UAPB Aquaculture/Fisheries Center have collaborated with scientists from other research groups in Arkansas and other Mississippi River Basin states, and have started monitoring agricultural storm water discharges from agricultural fields, water quality and biological condition in adjacent streams in southeast Arkansas since April 2011. The project was granted new fund and expected to complete at the end of 2015.

Results

The current results found that agricultural conservation activities may have some effects on reducing nutrients and sediments runoff to streams. More comprehensive suggestions will be provided for farmers to minimize agriculture related impacts when biological data are analyzed and ecological quantitative links have been constructed with future research efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

Outcome #6

1. Outcome Measures

AGFC biologists will use information on hatchery fish influence on wild fish to inform decisions regarding stocking enhancement

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Use of information to support the management used towards the largemouth bass fishery in the Arkansas River

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of research recommendations transferred to AGFC staff

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Percent of AGFC fisheries biologists that are informed about the study results

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Number of non-agency fisheries biologists that learned what we know

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Number of stakeholders gaining access to the economic analysis of alternative climate change adaptation and mitigation policy

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Various conventions of the United Nations and other agreements acknowledge the vulnerability of developing countries to the negative effects of climate change, particularly the low-lying coastal areas and areas prone to desertification and drought, and thus promise to present extensive support through investment, insurance, and technology transfer. As a part to the United Nations Framework Convention on Climate Change, the United States is actively engaging with the international community to find solutions and promote global cooperation on climate change.

What has been done

The Aquaculture/Fisheries Center of Excellence at UAPB, in collaboration with the International Food Policy Research Institute and the Asian Development Bank, has assessed the fisheries development strategies for four Pacific coral triangle (CT) countries - Fiji, Solomon Islands, Timor-Leste, and Vanuatu - in response to the projected impacts of climate change. Specifically, the projects has (1) carried out a study of the economic impacts of climate change adaptation strategies on the fisheries sector, using a model of the fisheries sector of each country; and (2) assessed adaptation strategies for coastal communities in the Pacific CT countries, using the results of the economic analysis study. The model undertook comparative analysis of alternative fisheries development scenarios for 2035 and 2050, while taking account of the impact of climate change in the fisheries sector.

Results

The economic (welfare) analysis conducted based on modeling results show that the national-level net economic gains due to climate change adaptation strategies are substantial. In most cases, the yearly net benefit is more than 10- to 20-fold higher than the required yearly investment cost.

We have developed a rigorous analytical tool that is capable of comparatively analyzing

alternative development scenarios, even under data-scarce situations. The model is utilized to analyze the potential effects of various climate change adaptation strategies in the four Pacific Island countries (Fiji, Solomon Islands, Timor Leste and Vanuatu) studied. More than sixty stakeholders from these four countries and other regional organizations have gained access to our models and economic analysis. Several Pacific CT counties have initiated plans to utilize the model for their national planning purposes. The model is also applicable for analyzing potential economic impact of climate change adaptation strategies on aquaculture and fisheries sector in other countries.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #12

1. Outcome Measures

Number of AGFC fisheries biologists and managers that use study results to address management issues

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Provide science-based information to resource managers that increases understanding of largemouth bass dynamics and enhances largemouth bass management in Arkansas waters

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Arkansas Game and Fish Commission (AGFC) annually spends the vast majority of their sportfish restoration funding on supporting the nation's largest warmwater hatchery system. This system supports the culture of approximately 20 different fish species that are stocked annually into Arkansas waters. Ever increasing requests for more stockings in greater numbers by fisheries

managers has prompted AGFC fisheries administrators to begin thinking about evaluation of their current sportfish stocking programs. In particular, AGFC would like to know what factors are related to successful sportfish stockings. However, it is critical to understand what comprises a "successful" stocking. This is a very nebulous concept that varies across agencies, systems, and angler groups, and perhaps even within angler groups, (e.g., black bass anglers). For the purposes of this proposed research, it has been assumed that greater long-term survival of stocked fishes typifies a "successful" stocking, with the added assumption that these additional recruits will increase population size and angler catches and/or harvest over time.

Largemouth bass is the most targeted sport fish in Arkansas, receiving about 40% of the state's fishing effort. This effort translates into about \$300 million in economic impact annually by Arkansas Black bass anglers. The goal of AGFC's Black Bass Management Program is to "enhance bass fishing opportunities for the anglers of Arkansas through harvest regulations, stocking, trophy lake management, and habitat improvements" (AGFC 2002). Thus, better knowledge of bass recruitment rates and patterns of recruitment are vital for effective management, especially when contemplating harvest restrictions and/or evaluating their effects. However, bass recruitment and the factors affecting subsequent year-class strength is poorly understood for most Arkansas waters, and based on a few scant datasets. In addition, possibly strong compensatory mechanisms existing within bass fisheries add complexity to understanding recruitment dynamics. Given that the quality of any fishery is strongly related to the strength of its different year classes, a better understanding of largemouth bass recruitment (i.e., the process that establishes year-class strength) is warranted for Arkansas. Results will be useful to AGFC by adding insight into the complex process of largemouth bass recruitment. Over the long-term, results should allow AGFC fisheries managers to make more timely and appropriate decisions concerning bass management, which supplemental stockings, introductions, and/or implementation of harvest restrictions in a given system.

What has been done

Given the above background, UAPB has initiated a first phase to this work. Beginning in May 2013, eight representative Arkansas lakes were selected for study. In these lakes, spring and fall assessments of largemouth bass populations were completed to assess fish abundance, size structure, growth, and size of the adult spawning stock. Additional data also were collected that characterized co-existing sunfish communities. From June through October, periodic assessments of the age-0 largemouth bass cohort (i.e., 2013 year class) were completed in all lakes to monitor the abundance, feeding, growth, condition, and survival of age-0 bass. Sagittal otoliths were extracted from a subsample of age-0 bass from each lake to determine fish age (in days) and ascertain approximate hatching dates and durations for the 2013 cohort. Additionally, a suite of abiotic and biotic variables were monitored in all lakes throughout year coincident with bass assessments. Continued data collection during winter and spring 2014 will further assess the survival and performance of the 2013 largemouth bass year class, as well as lake-specific conditions. Beginning in spring 2014, monitoring will continue for another year into spring 2015, though it is probable that 1-2 substitutions of study areas may be needed.

Results

Given the comprehensive nature and complexity of this project, there are no results to represent at this time. Otoliths have all been extracted from all bass (~1,000) and are approximately 75% read. All stomach samples have been processed, with the contents grouped into logical taxonomic groupings (e.g., invertebrates, zooplankton, fishes, etc.). Notes of other species collected and/or observed (e.g., other predators, shads, etc.) have been tabulated and used to classify the lakes (e.g., high-shad abundance, high abundance of other piscivores, high abundances of sunfishes, etc.). Side-scan sonar technology was purchased and will be used to characterize lake-specific macrohabitat variables (e.g., lake area, lake depth, aquatic vegetation abundance, etc.).

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

Outcome #14

1. Outcome Measures

Provide science-based information to guide management decisions regarding stocking of hatchery-reared sport fishes to enhance wild fisheries in Arkansas waters

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Arkansas Game and Fish Commission has the largest warm water hatchery system in the United States. They produce millions of sport fish each year for stocking into public waters. Annual requests for sport fish stockings total more than 11 million fish. There is a need to determine which supplemental stockings are more likely to be successful, so that limited resources can be focused on production of fish likely to survive and supplemental natural fisheries.

What has been done

This study was conducted on six Arkansas reservoirs managed by the Arkansas Game and Fish Commission (AGFC). The reservoirs were Harris Brake, Cox Creek, Barnett, Overcup, Upper White Oak, and Cargile. Crappie, marked with oxytetracycline, ranging from 38.8 to 81.1 mm total length were stocked in Fall 2010 at densities ranging from 21 to 58 fish/acre. Age-1 crappie were sampled with rapnets in fall 2011. Catches ranged from 1 to 443 crappie of the same species as was previously stocked. In Fall 2011 oxytetracycline marked crappie were again stocked in the same six reservoirs, at densities ranging from 28 to 44 fish/acre. Trap net samples in Fall 2012 resulted in catches of 0 to 100 crappie of the same species as was stocked the previous fall.

Results

No marked fish were found within the Fall 2011 samples. Likewise, not marked fish were present in the Fall 2012 samples. In several instances, the most abundant species of crappie (i.e., White Crappie or Black Crappie) was not the species stocked by the Commission. The efficacy of

supplementing wild crappie populations with hatchery produced fish was not supported by this study.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Other (Political, public relations, and economic factors are involved in almost any management adopted by AGFC)

Brief Explanation

Although all research is ultimately done to serve public interests, AGFC manages fisheries for the state of Arkansas, thus, we do not deliver our research or recommendations directly to the public. Dissemination of management research and other information, and eventually management actions are determined through the fisheries management process by AGFC, of which we only affect the science component.

Absence of sufficient resources, including a graduate student dedicated to this research, would jeopardize achievement of project objectives.

If AGFC research priorities change in the next few years, medium-term and long-term outcomes would change.

Battery failure or theft of loggers

Due to colder than normal Spring 2013 temperatures, lesser scaup remained on fish farms for several weeks longer than usual. During this time it is pressured that they consumed large quantities of small fish. This unusual weather pattern also caused fish to be exposed to colder water temperatures for a longer than normal period of time.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Results of the constructed wetland project suggest that the quality of the wastewater was improved after passing through the Swine Wastewater Treatment System and constructed wetland, with respect to the removal of total nitrogen, phosphorus, and ammonia. The annual nutrient removal percentages were 49% (phosphorus), 45% (total nitrogen) and 38% (ammonia). After treatment, wastewater concentration levels for each nutrient were below 10 mg/L each month throughout the duration of this study; which is in compliance with Arkansas state law regulation No. 6. The parameter with the highest annual standard deviation (11 mg/L) was ammonia, indicating large concentration variations of this nutrient in the wastewater; likely due to its relatively short existence in the environment before its rapid conversion to ammonium, as suggested by Hargreaves and Tucker 2004. The parameter with the second highest annual standard deviation (4 mg/L) was total nitrogen, and lastly phosphorus (2 mg/L). The standard deviations for total

nitrogen and phosphorus suggest they may have been more "stable" nutrients in the wastewater than ammonia.

Significance will be determined statistically at an alpha level of 0.05.

Key Items of Evaluation

Evaluation of this research will be initiated at some point in the future as warranted. Initial work will largely entail filling information gaps for Arkansas' bass fisheries and to provide a direction for future research. The evaluation study will likely entail a scaled-response survey of relevant biologists conducted by an independent third party. The survey would contain questions that rated the utility of the work. This survey would not be conducted for at least 6-8 years.

Evaluation of the impacts of this research will be based on email surveys to AGFC fisheries management biologists as has been done previously. This survey would be conducted using an independent third-party evaluator. This evaluation will not occur for several years at least, since this is a new project.

Temperature correlations with fish losses.

Significant reduction in lipid stores, growth, survival, and respiration will determine success.

Constructed wetlands for swine waste nutrient removal can be very effective as demonstrated by the swine waste treatment system project.

V(A). Planned Program (Summary)**Program # 4****1. Name of the Planned Program**

Global Food Security and Hunger

 Reporting on this Program**V(B). Program Knowledge Area(s)****1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
202	Plant Genetic Resources		10%		26%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants		14%		10%
205	Plant Management Systems		15%		7%
211	Insects, Mites, and Other Arthropods Affecting Plants		6%		0%
213	Weeds Affecting Plants		10%		0%
301	Reproductive Performance of Animals		6%		5%
302	Nutrient Utilization in Animals		0%		5%
307	Animal Management Systems		0%		10%
311	Animal Diseases		12%		7%
601	Economics of Agricultural Production and Farm Management		5%		13%
602	Business Management, Finance, and Taxation		12%		0%
603	Market Economics		0%		10%
610	Domestic Policy Analysis		5%		7%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures		5%		0%
	Total		100%		100%

V(C). Planned Program (Inputs)**1. Actual amount of FTE/SYs expended this Program**

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	5.0	0.0	6.5
Actual Paid Professional	0.0	18.1	0.0	20.6
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	1348268	0	2070416
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	1181133	0	1456132
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Small farm management assistance was provided by Extension Associates through direct one-on-one contact and group training to Small and Socially Disadvantaged Farmers (SSDF) and youth. Assistance included: record keeping, financial planning, vegetable and row crop production, risk management education, food safety education, the use of USDA programs, forestry management, securing housing assistance, livestock and pasture production, and FAMACHA scoring.

Winter and summer forage experiments were conducted with mixed species (cattle and goats) and two swine finishing experiments were completed.

The sweet potato Foundation Seed Program provided virus indexed sweet potatoes for production, storage, handling and marketing activities. Herb and ornamental plant trials were also conducted.

On-farm fruit and vegetable demonstrations were conducted to determine their suitability for the Arkansas Delta and Southwestern Arkansas.

Two cowpea cultivars (UAPB-1 and UAPB-2) were increased as foundation seeds; 100 rice germplasm accessions, 12 rice cultivars and 12 hybrid breeding lines were evaluated for straighthead resistance.

Literature was analyzed on major bio-based and sustainable fibers (alpaca, kenaf, linen, and spider silk); a YouTube video on kenaf was produced; 3 related papers were presented.

A wide range of activities will be conducted in carrying out this planned program. Aquaculture in Arkansas provides a local source of healthy, high protein, low fat food, and creates economic activity and jobs. To support family fish farmers, potential producers, and the general public, integrated research and extension programs were developed. Program planning was conducted through discussions with individual farmers and with farmer associations (e.g., Catfish Farmers of Arkansas, Arkansas Bait and Ornamental Fish Growers Association). Activities consisted of research studies in the laboratory and on the experiment station, on-farm research trials, extension farm visits, calls, e-mails, newsletters, workshops, webinars, freshwater aquaculture eXtension content, and presentations. Water quality and fish health services were provided to support educational programs. This activity includes a variety of projects aimed at improving productivity and competitiveness of U.S. aquaculture. Projects to be conducted in 2012 included: 1) pond production samples; 2) nutrition studies; 3) water quality studies; 4) disease work; 5) hatchery studies; and 6) economics and financial management analyses. Extension methods include farm

visits, producer meetings, newsletter, a verification blog, a field day, and e-mail lists.

Annually, Arkansas Catfish Producers lose over \$1 million worth of catfish due to catfish diseases. With the need to increase production and improve economics, new diseases are emerging such as the "hot aeromonas" seen during summers of 2010 and 2011. The new diseases have the potential to devastate the catfish industry across Arkansas. Samples will be collected from the field when the disease cases occur. The samples will be incubated at the Lake Village Laboratory and shipped to UAPB for further diagnostic procedures. The goal is to develop techniques to rapidly identify the disease and to improve treatment success results.

Currently there are no medications that are legally approved to treat the disease. The only avenue of treatment is to attain an INAD, Investigative New Animal Drug Permit from the US Fish and Wildlife Service for the use of the drug Aquaflor.

Evaluating split-pond aquaculture systems for catfish production in Arkansas is a completely new verification study offered for the first time in Arkansas in 2012 and will continue to shrink over the years to less than 10,000 acres. The loss in acreage can be attributed to importation of cheaper foreign fish products and low profitability of our product due to higher production costs such as feed and energy. A split pond system offers a new production system which should improve pond production and increase farm efficiencies.

A pond study will be conducted to identify the best alternative use of 5-inch hybrid catfish fingerlings, whether in single or multiple-batch production.

A spreadsheet-based economic risk analysis of hybrid striped bass fingerling production in ponds and tanks will be developed to compare the level of risk in hybrid striped fingerling production in ponds and in tanks. A mixed-integer model of hybrid striped bass fingerling production will be developed to examine the trade-offs among various hybrid striped bass fingerling production strategies.

A two-year linear programming model will be built to identify optimal feed strategies over a 2-year period with varying feeding strategies for channel catfish. Other mathematical models will be developed to predict the mean weight of channel catfish under a variety of stocking densities, stocking sizes, and feeding strategies.

Intensive financial management workshops will be held.

Enhancement of hatchery efficiency through applied physiology. This program will identify specific areas of hatchery inefficiency (e.g., broodstock selection, low fecundity, and fry-fingerling survival) and adapt viable alternatives to existing practices by integrating fish physiology with hatchery management.

Research will be conducted to develop better methods for the detection, control, and eradication of aquatic animal diseases. Diagnostic laboratories will assist in the diagnosis and management of aquatic animal diseases. Regulatory testing and biosecurity management will be provided to facilitate the interstate and international movement of aquaculture products.

Research will be conducted to develop methods to control predators of larval fish which cause death and disease in small fish. Laboratory, mesocosm and pond studies will be conducted to determine the LC50 value of several aquaculture chemicals to copepods.

Research will be conducted to determine the feasibility of producing a triploid hybrid striped bass.

Work to develop methods to rear alligator gar to 10-15 inches for stock enhancement will continue in 2012. Nine 0.1-acre earthen ponds will be drained and dried during the winter. Three ponds will have rye grass planted on the pond bottom in a 1-m band around the perimeter. Three ponds will have artificial structure along the pond perimeter. In the spring, the ponds will be filled and fertilized according to standard procedures for fish fry production. Alligator gar (5 dph) from the Tupelo USFWS Hatchery will be stocked into ponds at a rate of 10,000 fish/acre. A subset of fry will be weighed and measured to determine initial size of stocking. At 30 dph, fry will be seined from each of the ponds and enumerated. A subsample of alligator gar will be weighed and measured at the time of harvest. Survival and growth will be compared among the two treatments and control using a one-way ANOVA.

Thirty day post hatch alligator gar fingerlings will be stocked into concrete raceways. Three raceways will receive forage fish and formulated feed, and the alligator gar in these raceways will be hand

graded daily into three size groups (small, medium, and large) using subdividers within the raceways. This is treatment number two. Two raceways will receive formulated feed, and the alligator gar in these raceways will be hand graded daily into three size groups as described ab

Fish farmers have expressed an interest in split-pond production systems for other fish species in addition to catfish. Confining fish to a portion of the pond increases ease of feeding, harvest, aeration, and protection from avian predators. Three split-pond field research studies will be conducted this year. A winter study will determine the relative growth and survival of golden shiners in traditional and split-ponds at normal and high fish densities. The second study will evaluate zooplankton growth and standing crop in traditional and split-ponds. The waste treatment section of the split-pond may serve as a zooplankton refuge, and increase overall production compared to that obtained in traditional-ponds, where fish predation greatly reduces numbers of large zooplankton. The third study will evaluate split-pond systems for fathead minnow production. Ancillary studies in flow tanks will determine the effects of flow rate and fish density on growth of fish species, critical design parameters for split-pond systems. Results will be disseminated to farmers and dothers at the aquaculture field day, presentations, personal contacts, and publications.

2. Brief description of the target audience

The primary audience for this program consists of Small and Socially Disadvantaged Farmers (SSDF) and their families. The fiber and textile industry as well as end-product manufacturers/users should be able to utilize information generated from various fibers. Small Farms as defined by the National Commission on Small Farms are those farms with \$250,000 in gross sales or less while Socially Disadvantaged Farmers are those who have been subjected to racial or ethnic prejudices because of their identity as a member of a group without regard to their individual qualities. Identified groups include: African Americans, Hispanics, Asians, American Indians or Alaska Natives, and Native Hawaiians or other Pacific Islanders. However, UAPB does not discriminate against any individual and services are provided to all who request it.

Aquaculture production primarily occurs on family farms; most are small businesses without resources to conduct internal research, and many find it increasingly difficult to keep informed of changing rules and regulations without assistance from extension. Thus, primary target audiences include commercial baitfish and catfish producers, hatchery managers, and private pond owners throughout Arkansas, County Extension agents, grocery store managers, consumers, and state agencies involved in the regulation or control of aquatic animal diseases.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	15983	50751	1145	804

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	5	8	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- The number of research studies and demonstrations conducted

Year	Actual
2013	25

Output #2

Output Measure

- The number of farmers provided assistance in applying for USDA programs

Year	Actual
2013	152

Output #3

Output Measure

- The number of newsletters, fact sheets, etc. distributed

Year	Actual
2013	3207

Output #4

Output Measure

- The number of newspaper articles published

Year	Actual
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2013 33

Output #5

Output Measure

- The number of field days held

Year	Actual
2013	2

Output #6

Output Measure

- Number of presentations made

Year	Actual
2013	31

Output #7

Output Measure

- The number of workshops and training sessions conducted

Year	Actual
2013	26

Output #8

Output Measure

- Number of refereed journal articles

Year	Actual
2013	6

Output #9

Output Measure

- Number of abstracts

Year	Actual
2013	32

Output #10

Output Measure

- Number of presentations

Year	Actual
2013	42

Output #11

Output Measure

- Number of trade magazine articles

Year	Actual
2013	3

Output #12

Output Measure

- Number of factsheets and newsletters

Year	Actual
2013	5

Output #13

Output Measure

- Number of peer reviewed journal articles

Year	Actual
2013	7

Output #14

Output Measure

- Number of publications

Year	Actual
2013	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased economic opportunity and profitability for SSDF
2	An increase in the number of SSDF that adopt one or more Best Management Practices for crop production
3	Increase the number of farmers that develop an estate plan to reduce land loss by Socially Disadvantaged Farmers
4	Enhanced crop diversity on SSDF to increase profitability
5	Increase the number of SSDF that adopt one or more Best Management Practices for livestock production
6	Financial impact of diagnostic services
7	Number of fish farmers using improved management (nutrition, water quality, stocking, production systems, economics, financial) practices
8	Value of aquatic animal exports requiring inspection and biosecurity assistance
9	Number of hatcheries using improved or novel management practices
10	Number of stakeholders using results of marketing studies
11	Generation of new ideas/concepts for textile structures/end products from bio-fibers
12	Increase in the number of SSDF that develop a risk management plan to reduce land loss.

Outcome #1

1. Outcome Measures

Increased economic opportunity and profitability for SSDF

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sweet potatoes are susceptible to viruses and mutations which cause a decline in yields, quality, and marketability. Arkansas Farmers are in need of certified virus-indexed planting materials to increase their profitability. Previously, farmers used seed potatoes from prior crops and/or relied on out of state sources for certified planting materials, but now the University of Arkansas at Pine Bluff has started the Sweet potato Foundation Seed Project to assist them.

What has been done

On the sweet potato project, UAPB produced 200 bushels of generation one (G1) sweet potatoes that will be available to farmers in 2014.

Results

For the sweet potato project, 200 bushels of G1 sweet potatoes (Beauregard) were produced and will be sold to slip producers at \$15.00 per bushel. UAPB's Sweet potato Foundation Seed Project continues to help farmers in Arkansas increase their profit margins.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #2

1. Outcome Measures

An increase in the number of SSDP that adopt one or more Best Management Practices for crop production

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Small and Socially Disadvantaged Producers (SSDP) have a difficult time in obtaining yields that are above average. This causes profit margins to be extremely low if not negative. It also prevents some producers from repaying their operating loans. The analysis of these operations indicated that in many cases these low yields were due to the failure to use recommended production practices (soil testing, recommended varieties, herbicide resistant weed control plans etc.). Also in some cases SSDP were operating a large amount of unimproved land that requires extra modifications to produce good yields.

What has been done

To help SSDP improve their yields the small farm staff started helping SSDP take soil samples and assisted producers in selecting CES recommended crop varieties. The staff also worked with producers to help them develop a Glyphosate Resistant Pigweed Control Plan (GRPCP) for their operations (the new resistant pigweed is the most destructive weed in Arkansas crops). The program staff also worked with NRCS to help SSDP receiving funding to install conservation practices to improve their land.

Results

As a result of using the different recommended production practices at least 50 SSDP have increased their income between 15-25 percent. These SSDP take soil samples regularly and follow the fertilizer and lime recommendations. They all have GRPCP that they use and they consult with Extension associates concerning any changes that may be needed. Also, an additional 15 SSDP significantly increased their yield as a result of installing conservation land improvement practices. Practices such as precision land leveling, underground pipelines, cover crops, irrigation water management, and nutrient management were added to their operations to help increase yields.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #3

1. Outcome Measures

Increase the number of farmers that develop an estate plan to reduce land loss by Socially Disadvantaged Farmers

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Socially Disadvantaged Producers (SDP) are not able to gain access to governmental cost share programs like the Environmental Quality Incentive Program (EQIP) and the Conservation Stewardship Program (CSP) because they operate heir property. These individual also find it difficult to sell and rent land and/or to get an operation loan on such land. Heir property issues are preventing many SDP from operating successful farms and ranches. This is a serious problem among SDP.

What has been done

The UAPB Outreach staff sponsored a series of educational meetings on Estate Planning in Helena, Dermott, Eudora, Hope, and Pine Bluff, Arkansas. Estate planning lawyers provided technical expertise in these meetings. This helped the outreach staff to become familiar with some of the tools available to assist producers in estate planning. Subsequently, the outreach staff provided information to producers as requested and follow up as needed. Producers were encouraged to see and estate planning lawyer because the information was for education purposes only. In addition, estate planning news articles are often written and appear in local newspapers in these areas

Results

As a result of the educational meetings and news articles, many SDP are working to develop their estate plans; however, most of these plans involve working with other family members who have different opinions on how the land should be used or the plan should be developed. This is a slow process but the process has begun. Currently there are several individuals who are working to get approval from family members on their proposed estate plan. In all of these cases, the work on their estate plan was started as a result of the outreach estate educational meetings or conversations about estate planning with the outreach staff.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
610	Domestic Policy Analysis

Outcome #4

1. Outcome Measures

Enhanced crop diversity on SSDF to increase profitability

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Strawberry growers have relied on production practices that are not sustainable, including the use of methyl bromide for disease management. The strawberry project focused on exploring methods to establish and expand sustainable strawberry production in the state.

What has been done

Extensive outreach and education on high tunnel and row covers for extending the strawberry production season was provided. Also, sustainable soil quality improvement techniques; integrated pest and diseases management; water and energy conservation; and reduction of the risks of introducing pathogens through human contact were covered with participants.

Results

The short-term outcomes include awareness of various sustainable strawberry production practices, including extension of the production season. The medium-term outcomes are expected to be addition of strawberries to farmers' existing operations, adoption of sustainable production practices, and change in behavior towards proper fruit harvesting and handling practices. The anticipated long-term outcome will be increased strawberry production capacity, reduced input and cost of strawberry production, and increased sales, leading to increased socio-economic and environmental sustainability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Increase the number of SSDF that adopt one or more Best Management Practices for livestock production

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small Farmers and Socially Disadvantaged Farmers often rely on small ruminant production to supplement or completely provide farm income, especially on marginal lands. Young kids and pregnant and lactating females are particularly susceptible to Haemonchus infection that frequently kills its host. Small ruminant producers need more effective methods of controlling Haemonchus on their farms to reduce economic losses. Many SSDF are also new or beginning farmers and do not know how to properly manage livestock. They require training in basic livestock management skills to have a chance of being successful.

What has been done

Four gastrointestinal parasite management workshops were conducted to educate producers about the use of FAMACHA scoring and proper use of chemical dewormers to reduce the

development of resistance, reduce the cost of medicine and reduce death losses to gastrointestinal parasites. Three workshops on the basics of beef cattle management and restocking after drought were held in southern Arkansas, and 2 in-service trainings were provided to multi-county agents and NRCS personnel so they could assist livestock producers. A workshop on sheep management was held in central Arkansas. A planning session with stakeholders in northeastern Arkansas was held to investigate and educate producers on opportunities in swine production.

Results

As a result of the program, 5 multi-county agents and 32 NRCS professionals gained knowledge to help SSDF raise livestock successfully. Twenty beef cattle producers learned skills in animal handling and the use of basic management tools. Over 120 goat and sheep producers learned integrated parasite management methods. Twenty goat producers in southeastern and central Arkansas reduced the frequency with which they deworm their goats, reducing their costs by an estimated \$460 per farm and slowing the rate of development of parasite resistance to anthelmintics. Seven producers in northeastern Arkansas decided against entering swine production due to the current market conditions and prices, but are prepared to take advantage of market opportunities once prices improve.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Financial impact of diagnostic services

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

UAPB offers the only fish disease diagnostic services in Arkansas. Timely diagnosis and treatment is essential to the profitability of fish farming businesses.

What has been done

The UAPB Fish Disease Diagnostic Services handled 2,112 cases in 2013 in more than 30 species of fish and over 40 different diseases. These were submitted by 145 fish farms and pond owners from 10 different states.

Results

Fish farmers received accurate diagnoses and treatment recommendation to minimize losses due to fish diseases.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #7

1. Outcome Measures

Number of fish farmers using improved management (nutrition, water quality, stocking, production systems, economics, financial) practices

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many fish farms lack business management training but current financial climate requires detailed business planning and financial analysis.

Some catfish farmers have begun to adapt new, more intensive production technologies, but little is known about why some farmers have adapted them and others have not, whether they are cost effective.

Commercial catfish farming has endured difficult economic conditions, resulting in a 70 percent decrease in acreage in Arkansas. Producers are seeking innovations to retain family farms. The split-pond aquaculture production system has emerged as a new technology, and producers of

other fish species have also expressed strong interest in this system.

What has been done

Business management and financial workshops were presented in 6 different states with hands-on practicums with real-world scenarios.

A survey of catfish farmers was conducted to identify reasons for adoption and non-adoption of new catfish production technologies. Economic analyses were developed to compare costs of new technologies with traditional open ponds.

Research verification by the UAPB Aquaculture/Fisheries Center is providing farmers with data from commercial catfish split-ponds. Production costs and returns, returns on investment, and financial risk are being determined. Extension personnel are working with farmers on split-ponds for sportfish and baitfish. Engineering studies are improving the paddlewheel for split-ponds. Night-time oxygenated zones within split-ponds and traditional ponds are being mapped.

Results

At least 10 farmers have indicated that they followed up by developing a detailed business plan and have begun to analyze financial statements periodically.

Economic analyses show that production costs are lower with the new catfish production technologies but financial risk is greater.

Extension verification trials have documented catfish yields from commercial split ponds that are two three times higher than typical yields. Economic analyses indicate that the new system has potential to reduce catfish production costs by approximately 10 cents per pound as compared to costs in traditional ponds. Analyses show breakeven yields for split-pond systems for catfish to provide guidance for farmers on management strategies necessary to achieve the potential cost savings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
603	Market Economics

Outcome #8

1. Outcome Measures

Value of aquatic animal exports requiring inspection and biosecurity assistance

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	170

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Most states require live fish sold to buyers in their states to be accompanied by a certificate that demonstrates the fish to be free of specified diseases.

What has been done

The UAPB Fish Disease Diagnostic Laboratory conducted 170 fish health inspections in 2013.

Results

Fish farmers were able to continue to sell live fish to customers due to the inspections and certificates issues.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #9

1. Outcome Measures

Number of hatcheries using improved or novel management practices

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This program identifies specific areas of hatchery inefficiency (e.g. broodstock selection, artificial spawning procedures, low fecundity, impact of stress on performance, and fry-fingerling survival) and creates viable alternatives to existing practices by integrating fish physiology with hatchery management and fish production. The direct target audience includes commercial aquaculture entities and public agencies involved with the production of fish for enhancement purposes.

What has been done

We examined the efficacy artificial spawning practices to characterize bottlenecks in fry production, propose solutions, evaluate proposals, and distribute findings to stakeholders. We continue to work with Baxter Land Company in satisfying requirements for the use of Investigational New Animal Drugs necessary for the production of hybrid catfish fingerlings. Over the past seven years Baxter Land Company has become an industry leader in hybrid catfish fingerling production. We have extended support to other farmers aggressively pursuing new techniques for artificial spawning of fish; notably, Dunn's Aquaculture for the commercial production of largemouth bass. We are developing artificial spawning with other species valuable to the industry (Smallmouth Buffalo).

We are evaluating techniques to enhance stress resistance in fry and fingerlings. Ultrasound, surface mucus constituents, and respirometry techniques continue to provide insight on annual reproductive cycles and stress through less invasive testing strategies. A collaboration with Aquaculture/Fisheries extension is employing respirometry techniques as an approach to understanding high winter losses of baitfish during winter 2012/2013.

Results

While Baxter Land Company has emerged as an independent leader in hybrid catfish fingerling production, other farmers rearing different species require more support. A manuscript reporting the results describing the utility of surface mucus constituents in assessing sexual maturation in white bass broodstock was accepted for publication.

We have performed techniques that enhance resistance to ammonia challenge in channel catfish fry. This reported resistance was induced by heat shock and not applicable to applied commercial settings. While copper sulfate treatments are reported to induce processes similar to heat shock, inconsistent outcomes for enhancing resistance to aquaculture stressors have been observed.

We have developed an approach for channel catfish in measuring a quantitative marker for stress resistance (HSP70 mRNA) and are developing assays for the HSP70 protein.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
311	Animal Diseases

Outcome #10

1. Outcome Measures

Number of stakeholders using results of marketing studies

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Fish and seafood are highly traded in international markets. According to the Food and Agriculture Organization of the United Nations (FAO), 38% of fish produced in the world was exported in 2010. This implies that there are inherent imbalances in regional supply and regional demand for fish/seafood, and international trade, through price signals in markets, provides a mechanism to resolve such imbalances. Therefore, it is important to understand the global linkages of supply and demand of fish to discuss production and consumption of fish/seafood in a given country or a region, while understanding the drivers of fish supply and demand in major countries and regions is essential in making inferences about global trade outcomes.

What has been done

The Aquaculture/Fisheries Center of Excellence at UAPB has been collaborating with the International Food Policy Research Institute World Bank, and Food and Agriculture Organization of the United Nation on a global project: "Fish to 2030: the Supply and Demand for Food Fish to 2030." The comprehensive assessment of the world's fish supply and demand covers production potential, projected demand for fisheries products, and key economic, technological and environmental factors. The study projects global supply and demand for fish and fish meal and oil using IFFRI's global food policy model known as IMPACT Model. The assessment includes 16 food fish categories from the production site, nine food fish/seafood categories from the consumption side, fish meal and fish oil. It deals with 115 country groups, including the United States.

Results

From the modelin exercise and scenario analyses, it is clear that aquaculture will continue to fill the growing supply-demand gap in the face of rapidly expanding global fish demand and relatively stable capture fisheries. While total fish supply likely will be equally split between capture and aquaculture by 2030, the model predicts that 62% of food fish will be produced by aquaculture by

2030. Beyond 2030, aquaculture likely will dominate future global fish supply. Consequently, ensuring successful and sustainable development of global aquaculture is an imperative agenda for the global economy. Investments in aquaculture must be thoughtfully undertaken with consideration of the entire value chain of the seafood industry. Policies should provide an enabling business environment that fosters efficiency and further technological innovations in aquaculture feeds, genetics and breeding, disease management, product processing, and marketing and distribution. Same is true for capture fisheries - developing enabling environment through governance reforms and other tools represents the first step towards recovery of over-harvested fish stock and sustainability of global capture fisheries.

Results reveal that the demand for fish and food fish consumption will increase sustainability in Asian countries, particularly in China, south Asian and southeast Asian regions. Net export of fish from China might decrease due to increased local consumption. World prices of fish meal and fish oil are expected to rise over the next 20 years. Food fish consumption in North America is also expected to increase. The aquaculture sector in the North American region has the potential to grow.

The UAPB team has shared the findings with various sections of the U.S. aquaculture/seafood industry. The industry representatives find this research effort and the results highly useful in designing and/or redesigning their business plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

Outcome #11

1. Outcome Measures

Generation of new ideas/concepts for textile structures/end products from bio-fibers

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #12

1. Outcome Measures

Increase in the number of SSDF that develop a risk management plan to reduce land loss.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Having a plan to manage the risks on a farm can be the difference between a successful and unsuccessful operation. However, most small and socially disadvantaged producers (SSDPs) have no plan because they have never been exposed to risk management education. These producers do not know the five basic areas of risk, common tools for managing risks, or how to prioritize risk for treatment. The failure to have a risk management plan has caused many SSDPs to have unprofitable farm or ranch operations and in some cases they have lost their farms.

What has been done

Personnel from UAPB, Delaware State University, and Alcorn State University partnered with a representative from the National Crop Insurance Service to conduct risk management training for SSDPs in Arkansas and Mississippi after recognizing the need to provide SSDPs with risk management training. Three structured workshops were scheduled and conducted one month apart. Each workshop consisted of six hours of instructions, case demonstrations, group

discussion, interactions, and networking. Each participant (same participants in each workshop) had homework assignments following each workshop and extension associates were available to assist participants with homework.

Results

Approximately 30 SDPs graduated from the training and received certificates of completions from the School of Agriculture, Fisheries, and Human Science at UAPB. After completing the class, three individuals changed their business structure from sole proprietorship to limited liability company (LLC), ten developed financial plans and received USDA Operating Loans, five ranchers signed-up and got funds to apply conservation practices from USDA Programs, two farmers developed plans and purchased grain bins using the USDA Farm Storage Facility Loan Program, and five farmers diversified their farms by growing southern peas to sell to Walmart.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

n/a

Key Items of Evaluation

n/a

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components		50%		20%
703	Nutrition Education and Behavior		50%		80%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	1.7
Actual Paid Professional	0.0	0.5	0.0	4.1
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	158881
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	93115
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Students (15) were recruited on campus through distribution of flyers at student events, dormitories, dining halls, lecture halls, dormitories, library, student union and the post office. They were delivered two education sessions in the interval of one week on the benefits of consuming dairy products. Strategies to incorporate low-lactose containing foods in the diets while avoiding the symptoms associated with lactose intolerance were taught along with food demonstrations. A 24-hr recall using USDA SuperTracker was conducted before and after the education sessions and the intervention. Pre and post data collected include dairy products, calcium and vitamin D intakes.

2. Brief description of the target audience

UAPB students (18-30 years old) males and females who have not reached their menopause. Participants were recruited through advertisement on campus using bulletin boards and UAPB Outlook internet.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	15	125	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 1. Number of participants in the education program

Year	Actual
2013	15

Output #2

Output Measure

- 2. Increase dairy products consumption

Year	Actual
2013	10

Output #3

Output Measure

- 3. Increase calcium intake

Year	Actual
2013	10

Output #4

Output Measure

- 4. Increase vitamin D intake

Year	Actual
2013	10

Output #5

Output Measure

- 5. Weight gain
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	1. Number of participants in the education program
2	2. Increase dairy products consumption
3	3. Increase calcium intake
4	4. Increase vitamin D intake
5	5. Weight gain

Outcome #1

1. Outcome Measures

1. Number of participants in the education program

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Individuals with lactose intolerance symptoms avoid dairy products resulting in reduced intake of calcium and vitamin D. Deficiencies of these two nutrients may predispose individuals to bone mineral deficiency, osteoporosis, and maybe obesity.

What has been done

Fifteen African American students enrolled at UAPB and who are lactose intolerant participated in two, one hour education, sessions on the benefits of consuming dairy products.

Results

Results showed an increase from 0.7 cup to 1.85 cup of dairy products per person and per day. The average daily intake of calcium increased from approximately 500mg to 800mg. There was an increase in vitamin D intake from 1.3 µg per to 2.5 µg.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #2

1. Outcome Measures

- 2. Increase dairy products consumption

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Results showed an increase from 0.7 cup to 1.85 cup of dairy products per person and per day.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

- 3. Increase calcium intake

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

The average daily intake of calcium increased from approximately 500mg to 800mg.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #4

1. Outcome Measures

- 4. Increase vitamin D intake

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

The intake of vitamin D increased from 1.3 µg per to 2.5 µg per day

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

5. Weight gain

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Other (Not only the participants submitted their results)

Brief Explanation

Only ten out of fifteen participants submitted their pre and post 24-hour recalls.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Results showed an increase of 1.2 cups of dairy products consumption per person and per day (from 0.7 cup to 1.85 cups, an increase of 62% from pre-intervention). There was an increase of 300 mg of calcium intake per day and per person from 500 mg to 800 mg (increase of 52%) and an increase of 1.2 micrograms of Vitamin D per day and per person (from 1.3 micrograms to 2.5 micrograms). It will be interesting to take anthropometric and weight data in the future to see how weight is affected by calcium and vitamin D intakes.

Key Items of Evaluation

Short nutrition education intervention on the benefits of increasing dairy products consumption in lactose intolerant can have an effect in increasing dairy products consumption and thus, calcium and vitamin D intakes in African American college students.

lactose intolerant

college student

dairy product consumption

calcium intake

vitamin D intake

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety in Aquaculture

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components		100%		0%
	Total		100%		0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	0.0
Actual Paid Professional	0.0	0.4	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	53958	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The 2008 Farm Bill included provisions to move inspection of catfish from FDA to USDA-FSIS, but has not yet been enacted. The 2014 Farm Bill has also included the Catfish Inspection Rule, but with a

timeline and a set of deadlines. USDA-FSIS lacks experience and knowledge on catfish farming and processing.

2. Brief description of the target audience

The targeted audience are members of USDA-FSIS and the general public, including catfish farmers and processors.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Briefings to catfish farmers and catfish processors

Year	Actual
2013	2

Output #2

Output Measure

- Number of presentations to catfish farmers and processors

Year	Actual
2013	2

Output #3

Output Measure

- Number of emails, phone calls, and conference calls to catfish farmers and processors

Year	Actual
2013	7

Output #4

Output Measure

- Number of newsletters, fact sheets, etc.

Year	Actual
2013	0

Output #5

Output Measure

- Number of field days held

Year	Actual
2013	0

Output #6

Output Measure

- Number of presentations made

Year	Actual
2013	0

Output #7

Output Measure

- Number of workshops and training sessions conducted

Year	Actual
2013	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Access to best-available science by USDA-FSIS personnel
2	Increased understanding of food safety issues in imported catfish and catfish-like products as compared to U.S. farm-raised catfish by public agencies, the aquaculture industry, and the general public

Outcome #1

1. Outcome Measures

Access to best-available science by USDA-FSIS personnel

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The 2008 Farm Bill included provisions to move inspection of catfish from FDA to USDA-FSIS, but has not yet been enacted. The 2014 Farm Bill has also included the Catfish Inspection Rule, but with a timeline and a set of deadlines. However, USDA-FSIS lacks experience and knowledge on catfish farming and processing.

What has been done

UAPB Aquaculture/Fisheries economists have provided scientific literature at the request of USDA-FSIS and provided assistance via teleconference calls and email correspondence. Summaries have also been provided to the Catfish Farmers of America.

Results

Implementation of the Catfish Inspection Rule appears to be moving forward as USDA-FSIS receives summaries and copies of the best-available science.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

Outcome #2

1. Outcome Measures

Increased understanding of food safety issues in imported catfish and catfish-like products as compared to U.S. farm-raised catfish by public agencies, the aquaculture industry, and the general public

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. consumers are increasingly concerned about the safety of imported catfish-like products. Greater information is needed to assist consumers and policy-makers to differentiate between catfish and catfish-like products.

What has been done

Presentations have been made at congressional briefings to Food and Water Watch (at their request), and at annual professional meetings.

Results

Greater numbers of individuals have acquired increased information on the relative safety of imported catfish and catfish-like products.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Public Policy changes

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

n/a

Key Items of Evaluation

n/a

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms		0%		100%
	Total		0%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.1
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Created gene silencing vectors
- Performed rice transformation

- Analysed gene expression

2. Brief description of the target audience

- rice farmers
- alternate energy users

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- - One peer reviewed publications - One abstracts in conference
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Generation of rice plants with reduced lignin concentration for efficient conversion to biofuel

Outcome #1

1. Outcome Measures

Generation of rice plants with reduced lignin concentration for efficient conversion to biofuel

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rice straw can be used for biofuel by the farmers.

What has been done

Reduced lignin biosynthetic gene expression was observed in transgenic rice lines.

Results

Over 60 transgenic lines were generated. At least 50% of the lines tested showed reduced expression of lignin biosynthetic genes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

1. Five gene vectors containing lignin biosynthetic genes were constructed and sequenced
2. Over 60 transgenic lines expressing five different genes involved in lignin biosynthesis were generated.

Key Items of Evaluation

1. Number of vectors constructed
2. Number of transgenic lines generated