

2013 University of Arkansas at Pine Bluff Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The University of Arkansas at Pine Bluff (UAPB), School of Agriculture, Fisheries and Human Sciences is composed of three academic departments, the 1890 research and Extension programs, the Aquaculture/Fisheries Center of Excellence and the Regulatory Science Center of Excellence. Research faculty members are integrated into the academic units in agriculture and human sciences, while Extension personnel are under the direct supervision of associate Extension administrators. The Department of Aquaculture/Fisheries and the Aquaculture/Fisheries Center of Excellence are administered by a department head who is also the center director. Under this structure, academic, research and/or extension responsibilities are integrated. The primary clientele served by the University of Arkansas at Pine Bluff are limited resource farmers and rural families as well as the Aquaculture industry, individuals and agencies with an interest in natural fisheries and fish habitats. Eastern and Southwestern Arkansas are the geographic beneficiary of these programs. Program areas continue to coincide with NIFA priority areas. The priority areas which are included are Global Food Security and Hunger, Climate Change, Sustainable Energy, Childhood Obesity, Food Safety, Food Safety in Aquaculture, and Families Youth and Communities. The Aquaculture/ Fisheries Center of Excellence is the only one of its kind at an 1890 institution and the research and Extension components of the program work closely with the aquaculture and fisheries leadership in the state. The Aquaculture/Fisheries Center of Excellence reports have been combined with the Agriculture and Human Sciences Departments and is reporting under the Climate Change priority areas. The Aquaculture/Fisheries Center has an additional reporting area entitled Food Safety in Aquaculture.

The Agriculture and Human Sciences Departments are reporting under the Global Food Security and Hunger, Food Safety, Climate Change, Childhood Obesity priority areas. The Agriculture Department has included Sustainable Energy as an additional reporting area for current and future plans of work. The Human Sciences Department continues to report in part under the area entitled Families Youth and Communities. Many of the research scientists in the Agriculture Department have both an academic appointment and a 5% extension assignment to facilitate the dissemination of information to students and clientele in eastern Arkansas and southwest Arkansas. Extension appointments are intended to assist small and limited-resource farmers with risk management, record keeping and developing the needed knowledge base for completing loan applications and participation in conservation programs. The Horticulture Program works with many of the same clientele, introducing on-farm research and demonstrations with horticultural crops. The Water Management Center located at Lonoke is also utilized in these outreach activities.

Arkansas is the second leading catfish-producing state in the U. S. The U.S. catfish industry has struggled through several years of low prices and severe cash flow problems. Priority areas include developing improved recommendations for stocking, grading, and harvesting catfish. Rigorous comparison of performance of hybrids with channel catfish, and pond evaluation of feeding strategies are also priorities. Off flavor has plagued the catfish industry for the past 30 years. At any time in the summer months over 80% of ponds are considered off flavor and unable to be marketed. To compound the problem, only two products are legally approved for use to control off flavor. The catfish production work

addresses these challenges for producers. Arkansas leads the nation in baitfish production, one of the top five segments of U.S. aquaculture. Programs are designed to improve profitability through improving management and production efficiencies for the baitfish industry, improve disease control and developing hatchery management techniques.

Seven programs are submitted for your review from the University of Arkansas at Pine Bluff. These programs are in line with NIFA National priority areas. The Plan of Work programs in agriculture are diverse in disciplines and are all aimed at increasing profitability of small farm enterprises in order to help rural farm families maintain economic vitality and to be able to remain on the farm. A reinvigorated textiles program will be reporting under the Global food Security and Hunger Priority (GFSH) Area. Also, research evaluating the nutritional and medicinal specialty crops will be reported under GFSH; in prior years these findings were reported under the Childhood Obesity Priority Area. Global Food Security and Hunger horticultural activities will examine new fruit and vegetable crops suited to small farm operations and production practices for yield enhancement. Food animal production and management, breeding and biotechnology, alternative crop production and value added product development are also included in GFSH. Animal production activities under GFSH are directed at lowering feed cost using alternative feeds for goats and swine. Breeding and biotechnology work under GFSH is directed at improved cowpea cultivars that resist biotic and abiotic stresses. Through biotechnology, transgenic cow peas containing insect resistant genes will be developed for the benefit of small- and limited-resource farmers in the southeastern United States. Alternative crop production activities under GFSH will examine new fruit and vegetable crops suited for small farm operations and production practices. Value added product activities are also included under GFSH. These activities will explore new and safe methods of processing vegetables and fruits that support new marketing avenues to further enhance income for small farm operators. An additional project entitled "Identification and Evaluation of Carotenoids in Chinese Cabbage" will also be reported under GFSH.

Agriculture outreach emphasizes livestock management, cropping systems and farm management. Our small farm initiatives are a combination of small farm outreach training and technical assistance (2501 funding), with an emphasis on agronomy. The outreach effort is focused on 18 counties in eastern and southwestern Arkansas.

Outreach activities address youth as young scholars with an aim to increase STEM proficiency. This is accomplished by engaging students through an after school program that enhances teen decision making. Also, the need for increased financial literacy among low income African American youth and their parents is being addressed with SAFHS outreach efforts. Agriculture and STEM awareness is emphasized among urban youth with workshops, camps and tours of the Small Farm Outreach and Demonstration Farm.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	23.5	0.0	21.3
2014	0.0	23.5	0.0	21.3
2015	0.0	23.5	0.0	21.3
2016	0.0	23.5	0.0	21.3
2017	0.0	23.5	0.0	21.3

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- 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 goals planned. 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.

Merit review is central to the institutional goal of implementing quality programs. Six years have past since the last NIFA review was completed, however other measures have been employed to fulfil the need for external program reviews. The previous request for a CSREES review was made in 2004. That review did not materialize and a second request for a CSREES review was made in 2005. This review was conducted April 30, through May 4, 2006. The review included all Extension and research programs in the school. The final report was received in July 2006 and several recommendations of the review are being implemented. Recommendations basically addressed administrative structure and not program issues. Research, Extension and academic programs are currently on a five-year external review rotation. External reviews of the Aquaculture Center, Human Sciences Department and the Agriculture Department have taken place since the 2006 CSREES (NIFA) external review. An external review of the Regualtory Science Center his scheduled for fall 2012.

The Merit Review Process in the School of Agriculture, Fisheries and Human Sciences resulted 23 journal articles published, nine accepted for publication, one book, two book

chapters, 31 Extension publications, 46 published abstracts and the review of 20 manuscripts that were subsequently submitted for consideration in refereed journals. Over 51 research, extension and teaching proposals were submitted to competitive programs.

The latest external review of the Aquaculture/Fisheries Center was conducted in June 2011 by the North Central Association Higher Learning Commission for program accreditation. Prior to the latest external review, an external review of the Aquaculture/Fisheries Center was conducted in April 2008, in conjunction with a review of the proposal for a Ph.D. program in Aquaculture/Fisheries. Experts from Mississippi State University, Purdue University and Iowa State University spent three days reviewing the Center. The review team concluded that, "the Department of Aquaculture and Fisheries has proposed, and is ready to add, what should become a nationally respected and competitive Ph.D. degree in Aquaculture and Fisheries." The team particularly noted the research productivity, fish health, fish nutrition and economics and marketing programs. The review team also noted that, "in the last 10 years, the UAPB Aquaculture and Fisheries program has become one of the three or four most productive aquaculture research programs in the United States.

The Department of Human Sciences planned an accreditation self-study for the Council for Accreditation of the American Association of Family and Consumer Sciences and recently received a site visit the results of which will not be known until November 2012. A self-study for accreditation for Dietetics Education was completed and the program received candidacy for accreditation; the child development center was re-accredited by the Arkansas Department of Human Services/Division of Child care and Early Childhood during 2011.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

The University of Arkansas at Pine Bluff administration and faculty are actively involved in professional meetings nationally and internationally that identify critical issues facing the state and nation. There is continuous contact between all partners in addition to formal advisory meetings to identify critical issues. Members of advisory committees often partner with the University in implementing critical programs.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Because of the 1890 mission to serve the under-served and under-represented populations, these clientele are a priority for most of our programs. Advisory committees, task forces and other planning groups include clientele representing the under-served and under-represented population to ensure that programs are planned for effective delivery and targeted in the areas of most critical need.

3. How will the planned programs describe the expected outcomes and impacts?

We produce a report document bi-annually for distribution to all stakeholders. The University of Arkansas at Pine Bluff submits program impacts to the CSREES National Database and produces multiple publications on the research and programmatic outcomes. Outcomes and impacts are always communicated in a manner that clarifies the value of programs to current and future stakeholders.

4. How will the planned programs result in improved program effectiveness and/or

The University of Arkansas at Pine Bluff utilizes the unique continuum for identifying research needs based on local problems, providing the research needed and then applying the solutions to those identified problems through an Extension program. Today's issues are complex and require multi-disciplinary and multi-institutional approaches. This allows each partner to build on their individual strengths and rely on the expertise and talent of other partners to work as a team for overall effectiveness in programming. Evaluation is planned as a part of the overall program and is used to document progress toward outcomes.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages 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.

Advisory committees are essential to the stakeholder input process developed by SAFHS and approved by NIFA. 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 may 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. Earlier POWs described a stakeholder input process that, in light of structural differences in the departments and differences in audiences served, varied across departments and programs. This approach was taken because the clientele needs for research and Extension - programs other than aquaculture are broad in scope, local in nature and geographically limited.

Input and interaction from stakeholders and the UAPB Aquaculture/Fisheries Center (AFC) occurs on an almost daily basis. 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 discussions as the state of knowledge in particular areas through with 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 will be 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 in a specific number of counties.

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 and Human Sciences. The Council formally meets once a year, but members are 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 outreach needs of the School of Agriculture, Fisheries and Human Sciences. Members will serve on the Council on 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.) two (2) current and retired Extension professionals (one from 1890 and one from 1862) 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. Additional members have been added to the council which reflects the evolving research and Extension efforts of the Agriculture and Human Sciences Departments.

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 sportfish farms, feed mills, Arkansas Game and Fish Commission, U.S. Fish and Wildlife Service, and other 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. 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, the operates as part of the 1862 State Extension Service also hosts an annual advisory committee meeting to acquire aquaculture industry input and feedback for their Extension program. 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. The 2012 UAPB National Aquaculture and Fisheries Advisory Council Meeting convened on March 15, 2012. Members of the Advisory Council include representatives of the baitfish, catfish, and hatchery segments of aquaculture, officials with the Arkansas Game and Fish Commission, UAPB alumni, and scientists from other universities. The Center Director reported on the state of the center and summarized the research, extension, and teaching initiatives developed in response to recommendations from the previous meeting and from on-going requests from stakeholders.

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 will be 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.

Means for acquiring input varies depending upon the nature of the research or Extension program and the diversity of relevant stakeholders. These may 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 initial stakeholder input plan required each program to develop its own input mechanism depending upon the nature of the program and the targeted clients. An annual process is established to garner stakeholder input into the continued implementation of all ongoing research and Extension programs. This second stakeholder input requirement speaks to the importance of the advisory committee structure in the SAFHS.

Some formal mechanism is required to garner stakeholder input into the planning and implementation of any new research or Extension program.

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.

Informal input from stakeholders will be presented and discussed at formal meetings with faculty and staff. Strategies will be 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. Examples of input from a structured committee currently being implemented are the Foundation Seed program for sweetpotatoes and the baseline research for labeling herbicides for use on Arkansas sweetpotato farms. The input from the sessions were incorporated into outreach efforts (more extensive efforts with Sweet Potatoes, enhanced technical support for value-added processing, and expansion of the role and geographic scope of the Small-Farm Program). Also, two graduate students and a researcher have developed research project that investigate herbicides for use on sweetpotatoes grown on Arkansas farms. Each issue was addressed through program initiatives as allowed by available funding. The federal and state governments and some private funding was combined fund research projects and to build a sweet potato processing and storage facility in the Delta where soil conditions are ideal for growing sweet potatoes. UAPB has been involved for years in the development of production information for the crop.

The Agriculture Research and Extension Advisory Committee meets at least twice a year, once in the winter and once in the summer. The AREAC will be kept apprised of the Departments' programmatic progress.

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

2. Brief summary about Planned Program

Only a few generations ago, nearly everyone was involved in agriculture. Today less than 3 percent of the population is directly involved in agricultural production. Today's youth must have the opportunity to better understand agriculture, its industry, and its communities. Policy makers, educators and the public in general continue to express great concerns for the health and well-being of American children and their families. There is no substitute for families. No matter how effective institutions, programs and policies are they cannot replace families. Many children in this country grow-up in homes where their physical and emotional needs are not met. Research indicates that major shifts in the U.S. society have contributed to many changes that not only have impacted the economic security of families, but family structure, how children are being raised, and the routine of daily life in families. The health and well-being of children is linked to the health and well-being of the communities in which they live. In Arkansas nearly 7.6 percent of children live in communities that have been labeled *severely distressed*. These are places that have high levels of: poverty, food in-security, female-headed households, high school drop outs, and unemployment.. Experts predict that children growing up in these environments are faced with some tough odds to overcome.

Four programs will be integrated into the Families, Youth and Communities Program. These include the **Arkansas AG Awareness Adventures Program**, **1890 Nutrition Education Program** and *the 1890 Family and Child Development Program that includes the Young Scholars Program, and the newsletter, Teens on the Go*. *The Arkansas AG Awareness Adventures Program will use hands-on activities to teach youth about agriculture in the state and diverse careers in the field. The 1890 Nutrition Education Program will target low-income adults and youth in Jefferson County. The Young Scholars Program, in its 16th year of implementation, is an after-school program for low-income, minority children who live in a housing project. The focus of the program is math and science skills. The parents are also enrolled in the program and will meet weekly in small groups where the emphasis will be on developing self-sufficiency skills. Teens on the Go is written for students in grades 7-12. In its 33rd year, the newsletter emphasizes decision-making skills.*

These four programs build strong families and supportive communities. They add value to society.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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		45%		0%
806	Youth Development		55%		0%
	Total		100%		0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agriculture is a major industry in Arkansas, and yet it is seldom taught in elementary and junior high schools. Nearly half (forty-seven percent) of Arkansas' minority children live in single parent homes. They are more likely to be poor and are being raised without the support and guidance of a father in the home. Many of these children experience high levels of food insecurity during the year. Research predicts that a high number will not finish high school. Many tend to lag behind other children in their age range in school subjects such as math, science and reading.

The four focused programs, **The Arkansas AG Adventures Awareness Program, 1890 Nutrition Education Program, Teens on the Go** and the **Young Scholars Program** will address issues and offer solutions to help youth explore careers in agriculture and make life better, in general, for family members. These programs will engage communities in being supportive of the youth and families who live there.

2. Scope of the Program

- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Participants enrolled in the **Arkansas AG Adventures and Awareness Program** are expected to develop awareness of the importance of agriculture in the state and the diverse career opportunities associated with it. Parents enrolled in the **Young Scholars Program** are expected to develop skills to help their children achieve their full potential and become contributing members of society. Children enrolled in the program are expected to increase school performance and avoid dropping out of school. Teenagers receiving the newsletter, **Teens on the Go**, are expected to develop decision-making skills for dealing with critical issues they face. Low-income adults and youth in the **1890 Nutrition Education Program** are expected to use MyPlate in making food choices and controlling portion sizes.

2. Ultimate goal(s) of this Program

- 1). To increase an understanding of agriculture and ultimately encourage more youth to seek careers in the fields of agriculture, science, food, math, engineering, and technology (**Arkansas AG Adventures and Awareness Program**);
- 2) to help teenagers make better decisions regarding critical issues they face (**Teens on the Go**);
- 3) to develop the capacity of low-income, minority parents to create an environment that will enhance the development of their children (**Young Scholars Program**);
- 4) to help

low-income adults and youth develop nutrition skills that lead to healthy eating habits and being physically active most days of the week (**1890 Nutrition Education Program**); and 5) to help low-income, minority children increase school performance and avoid dropping out of school (**Young Scholars Program**).

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	1.3	0.0	0.0
2014	0.0	1.3	0.0	0.0
2015	0.0	1.3	0.0	0.0
2016	0.0	1.3	0.0	0.0
2017	0.0	1.3	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Four focused programs will be addressed in the Families, Youth and Communities Program. These include 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** will be implemented in the southeastern region for students in elementary through high school, the **1890 Nutrition Education Program** will be implemented in Jefferson County for low-income adults and youth. **Teens on the Go** is a newsletter that will be developed for students in grades 7-12. Students will receive 6 issues of the newsletter during the school year. The topics for 2013 include: 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** will be implemented in a housing project in Monroe County, located in the Delta Region of the State. The children, referred to as **Young Scholars**, will meet 5 days a week, year-long, in an after-school program that emphasizes math and science skills. Parents enrolled in the **Young Scholars Program** will meet in small groups weekly and focus on parenting education, stress management, coping and job related skills, family relationships, and economic-and self-sufficiency skills.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods

<ul style="list-style-type: none">● Education Class● Workshop● Group Discussion● Demonstrations● Other 1 (Direct mail)	<ul style="list-style-type: none">● Public Service Announcement● Newsletters● TV Media Programs● Other 1 (Radio programs)
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3. Description of targeted audience

The target audiences will include students in elementary through high school (Arkansas AG Adventures and Awareness Program and Teens on the Go), low-income, minority children and their families who live in a housing project (Young Scholars Program), and low-income adults and youth in Jefferson County (1890 Nutrition Education Program).

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- The number of participants in these programs will include direct and indirect contacts with youth and adults.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 Target

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. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Populations changes (immigration, new cultural groupings, etc.)

Description

Educational frameworks, school policies, natural disasters, changing economy and loss of jobs can affect the outcome of the planned program.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Planned evaluation will include before and after program assessments, self-reporting and observations.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

Fresh-cut produce became one of the fastest growing commodities, not only at institutional food service, but also at the consumer level. The sweet potato is an important vegetable, which are highly nutritious. Fresh-cut sweet potatoes are only marketed on a very limited scale due to rapid quality deterioration and short shelf life. An edible coating is a thin layer of edible material applied on the surface of a food product with the purpose of generating a semipermeable barrier to gases, water vapor, and volatile compounds. Edible coatings were found to be able to extend shelf life of fresh-cut products by decreasing respiration and senescence and protecting aroma, texture and color. Chitosan is a biodegradable biopolymer with inherent antimicrobial properties and moisture barrier properties. Cellulose derivatives such as hydroxylpropyl methylcellulose are a water-soluble polymer used in the food industry and promising materials for edible coatings or films for packaging. Sanitizers such as sodium hypochlorite and peroxyacetic/octanoic acid mixture are commonly used inexpensive sanitizers for fresh-cut produce.

Fresh-cut sweet potatoes will be treated with edible coatings or sanitizers and packaged under modified atmosphere packaging or air packaging. During refrigerated storage, samples will be evaluated for microbiological quality.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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		25%		25%
502	New and Improved Food Products		25%		25%
503	Quality Maintenance in Storing and Marketing Food Products		25%		25%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins		25%		25%
	Total		100%		100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Fresh-cut produce is any fresh fruit or vegetable that has been physically altered its original form by minimal processing steps such as cleaning, peeling, cutting, trimming, coring, slicing, or shredding. Fresh-cut fruit and vegetables products retain unprocessed and fresh-like sensory qualities. Fresh-cut produce is one of the fast growing value-added products in U.S. There are various types of fresh-cut produce currently available in the market including over-wrapped fresh-cut fruit, refrigerated jarred cut fruit, packaged fresh-cut fruit or vegetable or pre-cut salads. Fresh-cut processing may cause severe tissue damage on fresh-cut produce, leading to rapid quality deterioration and provide greater opportunity for contamination by pathogenic microorganisms. It is also important during the shelf life to keep minimally processed products fresh without losing its nutritional and sensory quality. Factors controlling the shelf life of minimally processed fruit and vegetable products are a result of a complex process of physico-chemical and biochemical modifications that can affect flavor, color, and texture. Fresh-cut produce is generally consumed raw without additional cooking. It is essential to assure that fresh-cut produce is free of pathogens. Therefore, this project will try to identify value-added processing procedures that can provide fresh-cut produce better quality and safety. Optimum processing procedures will be selected from data obtained from research experiments. Farmers who are interested in fresh-cut produce as value-added products can adopt the processing procedures for their product development. Currently, farmers in Arkansas produce a variety of vegetables including peas, beans, okra, leafy vegetables, cucumber, pepper, sweet potatoes, etc. However, fresh-cut produce in this project may focus on packaged pre-cut produce.

2. Scope of the Program

- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Fresh-cut sweet potatoes developed by selected experimental procedures through this project may

have better microbiological quality and more wholesome than untreated fresh-cut sweet potatoes. These products may offer produce growers and farmers an opportunity to increase sales by selling safe and good quality fresh-cut produce rather than selling regular raw produce. This study may be able to help local farmers to develop their niche markets offering consumers safer, better quality, and more convenient fresh-cut produce.

2. Ultimate goal(s) of this Program

This study focuses on effect of postharvest treatments to improve quality and safety of fresh-cut produce.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.3	0.0	0.7
2014	0.0	0.3	0.0	0.7
2015	0.0	0.3	0.0	0.7
2016	0.0	0.3	0.0	0.7
2017	0.0	0.3	0.0	0.7

V(F). Planned Program (Activity)

1. Activity for the Program

Fresh-cut sweetpotatoes will be treated with edible coatings such as hydroxy propyl methyl cellulose (HPMC) (1 %) (Methocel®) and chitosan (1%) or sanitizers such as sodium hypochlorite solution (100 ppm) and peroxyacetic/octanoic acid mixture (POAA/OA, Tsunami 200®, 40 ppm). Treated samples will be placed in PD 900 for modified atmosphere packaging and PD 941 bags for air packaging. The PD 900 bags will be flushed with gas mixture composed of 4/5% (O₂/CO₂) with a nitrogen balance. The PD 941 bags will be heat sealed.

Samples in bags will be stored in the refrigerator at 4°C. Samples will be taken from the refrigerator at intervals. The headspaces of O₂ and CO₂ will be checked. Aerobic plate counts and visual observation will be determined.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods

<ul style="list-style-type: none">• Workshop• One-on-One Intervention• Demonstrations	<ul style="list-style-type: none">• Newsletters
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3. Description of targeted audience

Local farmers and limited resource farmers

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Three abstracts and three presentations at the scientific annual meetings.
Three peer reviewed publications.
Three presentations and/or workshops to farmers.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 Target

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. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 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

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Weather conditions may affect produce production needed for the research.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

- Determine if postharvest technology treated fresh-cut produce shows better quality and safety using analytical and organoleptic analysis.
- Determine if small farmers who adopted UAPB's Fresh-Cut Process Procedure are satisfied with the procedure by survey.
- Determine if UAPB's fresh-cut processing procedures help small farmers increase sales in the marketplace by survey.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

Hog production in the United States generates an estimated 120 million to 200 million tons of solid waste per year. The methane gas produced by hog manure contributes to global climate change. Methane gas is over twenty times more potent than carbon dioxide as a greenhouse gas. The total number of traditional family-size hog farms (farms raising 1-100 hogs) in Arkansas has held relatively steady from 2005 to 2007 (630, 600, 610), factory farms have proliferated. Although fewer farmers raise hogs today than in prior years, the total number of hogs produced in Arkansas has skyrocketed because the number of factory farms has risen by over 200 percent since 1992. More than half of the state's hog farms have been cited by the state for environmental violations. The majority involve major pollution problems like animal waste leaks, spills and overflow manure lagoons. The appropriate treatment of swine waste and associated surface water quality is a key concern. This multidisciplinary research examines the effectiveness of a swine waste treatment system and a near-by constructed wetland system for reducing total nitrogen and total phosphorus in swine facility waste water.

Failure to properly manage manure and wastewater at concentrated animal production sites can negatively impact climate change, the environment and public health. Manure and wastewater have the potential to contribute pollutants such as nitrogen and phosphorus, organic matter, sediment, pathogens, heavy metals, hormones, and ammonia into the nation's ground and surface waters. In light of this, many farmers are becoming aware of the importance of an effective and efficient animal waste treatment system. Anaerobic swine wastewater treatment lagoons are often used where large numbers of swine are held. Constructed wetlands have received considerable attention as a possible wastewater treatment system component. However, questions exist about the long-term efficiency of constructed wetlands for swine wastewater treatment. The primary questions include nitrogen loading rates, oxidative/reductive conditions, de-nitrification potential, phosphorus removal rates, and ammonia toxicity to wetland plants.

Climate warming has been predicted to reduce habitat for cold and coolwater fish species by ~50%; effects on habitats for warmwater fish are thought likely to vary with species and more difficult to predict. Baseline studies on economically and socially important fisheries, such as those of the Arkansas River, will provide a foundation for managing impacts of future climate changes on the resource, either direct impacts on the fisheries or through habitat alteration. Recreational angling is an important contributor to the economy of Arkansas, with an estimated total economic impact (2006) of \$880 million. Arkansas has some 300,000 water bodies, and the majority of these are small impoundments.

Rapidly changing temperatures are particularly hard on poikilotherms, such as fish, especially if environmental conditions are sub-optimal. Proper management of small impoundments to improve water quality can help fish species handle stressors. This planned program integrates research and Extension components to elucidate the current status of the fisheries and associated ecosystem in Arkansas. The program will also assist private pond owners with management options to cope with changing environmental conditions and maintain utility of small impoundments for designated purposes.

Recent warmer winters have altered certain management aspects of small impoundments. Species of problematic aquatic plants, such as water hyacinth, that formerly were unable to survive the winter in

Arkansas, are now increasing in number and biomass. The exotic invasive alligatorweed has expanded in range into central Arkansas. Other pond weeds are becoming problematic as well. Educational programs include information on appropriate nutrient management practices to reduce unintended nutrient inputs into water bodies.

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 namagers 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. The goal of this proposed program is to provide science-based information to increase understanding of factors associated with successful sportfish stockings (as defined above) in Arkansas waters. Initially, largemouth bass will be emphasized because they are the most popular sportfish in Arkansas. This research will provide information that will enable AGFC to refine their stocking strategies for Arkansas lakes and better prioritize future stockings, with focus placed on waters that have better prospects for success. This is a growing priority as AGFC anticipates that maximum hatchery production of sportfishes will not be able to meet future demands by its fisheries managers.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water		20%		20%
112	Watershed Protection and Management		20%		15%
133	Pollution Prevention and Mitigation		15%		20%
134	Outdoor Recreation		10%		10%
204	Plant Product Quality and Utility (Preharvest)		20%		15%
403	Waste Disposal, Recycling, and Reuse		15%		20%
	Total		100%		100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The protection and conservation of water quality, quantity and the environment are vitally important to the health and development of thriving rural communities. The first line of defense (protection and conservation) rests with small, limited resource landowners/operators, underrepresented communities and families. Protection and conservation of the farm environment and water resources rely on research that addresses community based issues and the education of communities along with the assistance of water quality professionals. In Arkansas and much of the southern U.S. the pollution of surface and groundwater is strictly prohibited. No sewage, food, garbage, drainage from swine operations may be discharged or disposed of by means or manner that jeopardizes ground water quality, or waters of the state. More specifically, this research seeks to address water and air quality issues associated with small swine farms and opportunities for small farm income through cut flower markets associated with wetland plants.

Largemouth bass *Micropterus salmoides* are among the most popular sport fishes in the United States. Largemouth bass, along with spotted bass *M. punctulatus* and smallmouth bass *M. dolomieu*, comprise 46% of all angling effort expended in Arkansas. In 2002, the Arkansas Game and Fish Commission (AGFC) revised its Largemouth Bass Management Plan to address the needs of Arkansas recreational anglers, partially due to reduction in angler catches of largemouth bass. The primary goal of the revised plan is to enhance largemouth bass fishing opportunities.

In the Arkansas River, angling effort required to catch one largemouth bass weighing at least 2.2 kg remained near 300 hours between 1990 and 1999. Required effort began increasing in 2000 and peaked in 2003 at 1052 hours. In response to angler concerns about this decline, AGFC increased largemouth bass stocking in 2002. By 2006, effort required to catch a largemouth bass 2.2 kg or greater was reduced to 439 hours, though stocking of largemouth bass fingerlings continues. Assessment of the AGFC largemouth bass stocking program is challenged by the absence of measurable stocking objectives. It is uncertain what effect, if any, stocking has on wild largemouth bass.

Commercial aquaculture producers and state resource managers experience proliferation of unwanted aquatic vegetation on a yearly basis. Similar problems also affect thousands of acres of livestock watering ponds, row crop irrigation reservoirs and ditches, and noncommercial and recreational impoundments in Arkansas. A program priority is to provide authoritative identification of aquatic plants, and research-based information regarding methods and materials for timely aquatic plant management. Nutrient management is particularly important as a preventive measure within the context of an integrated management program. Native vegetation in ponds receiving intensive fishing pressure, excessive vegetation is problematic. Educating pond owners on all of the various management options is particularly important. Watershed impoundments in certain regions of Arkansas are particularly susceptible to low mineral conditions, creating stressful winter conditions for fish. Water testing followed by appropriate management, such as liming, can ameliorate pond water quality and improve fish health and survival. Arkansas has a large number of small impoundments that serve as sources of food and recreation. Many of these water bodies are old, and have experienced sedimentation and nutrient enrichment, resulting in increased aquatic vegetation problems. Warmer weather has increased the northern range of several problematic aquatic weeds.

2. Scope of the Program

- In-State Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Assumptions: -Using septic tanks to collect solid swine waste will reduce the odor associated with swine production.

-An anaerobic swine waste treatment lagoon which predominantly contains liquid waste (excluding solid waste) will exhibit tolerable odor.

- An anaerobic swine waste treatment lagoon which predominantly contains liquid waste (excluding solid waste) will reduce nitrogen levels with sufficient retention time.

-A constructed wetland system will reduce nutrient level associated with swine effluent from an anaerobic waste treatment lagoon.

-A constructed wetland system is capable of producing cut plant production for resale.

That this area of research remains an AGFC priority for a sufficient amount of time to complete needed research and produce useful results. AGFC could at any time shift to another priority or might request that we work with another species or in other lakes. This research as proposed cannot be conducted without a graduate student assistantship dedicated to the project throughout its duration. This proposed study will need a commitment from AGFC to provide oversight and appropriate control over experimental treatments (i.e., bass stockings or no bass stockings). Requirements of no bass stockings during certain time periods or bass stockings need to be met to insure that results are not compromised. Study areas where this cannot be guaranteed will be avoided. Any management recommendations from this research are subject to intra-agency approval and adoption by AGFC. It is possible that current AGFC stocking strategies cannot be improved as almost any recommendations will have logistical, economic, and political implications within AGFC, and social implications with regard to anglers. Factors such as these are beyond our control and unrelated to the science that will be done. In the absence of any support data, an assessment of AGFC sportfish stocking program is warranted at this time.

Including that a supplemental stocking program is successful often depends on the evaluation metrics. Percent contribution of stocked largemouth bass to the year-class is the most common method. However, most studies have not documented whether stocked fish increased total abundance, or replaced naturally-recruiting fish through compensatory mortality. Additionally, hatchery-reared largemouth bass abundance may affect growth, condition, or survival of wild largemouth bass. Hatchery-reared salmonids have caused changes in wild conspecific growth, but compensatory changes have not been documented in largemouth bass stocking evaluations in Arkansas. Other than stocking for the purpose of genetic introgression, replacement of wild fish with stocked fish may be an inefficient use of hatchery resources, as a goal of supplemental stocking is often to increase population abundance, rather than replace fish that occur in the system naturally. Determining the effects of variable stocking densities of hatchery-reared largemouth bass on wild largemouth bass will allow for better management of wild largemouth bass populations and more efficient use of hatchery resources.

A traditional approach to aquatic plant management has been to rely upon herbicides. However, in Arkansas, biological control methods e.g., triploid grass carp) have been well accepted and have reduced chemical use, and this implies that people are accepting of alternative techniques. A successful aquatic vegetation management program also incorporates nutrient management as an appropriate component of an overall plan, for certain water bodies. It is assumed that, within a holistic approach to vegetation management, Extension clientele will be willing to implement nutrient management techniques (e.g. buffer strips in pond watersheds).

2. Ultimate goal(s) of this Program

Goal: Enhance water quality/quantity and environmental conservation efforts of small, limited resource landowners, underrepresented communities, and families through research and Extension

programs that emphasize and encourage the adoption of sustainable consumer and production practices.

To gain a consensus among AGFC biologists in order to establish what they deem to be a "successful" sportfish stocking. This consensus can have major effects on the future of sportfish stocking by AGFC. To provide information on what factors (e.g. environmental, biological, etc.) are associated with "successful" sportfish stockings in Arkansas waters. To develop stock-recruitment relationships for largemouth bass in selected Arkansas waters. To generate other largemouth bass fishery-related statistics necessary for proper management in selected Arkansas waters. Provide guidance for AGFC fisheries management decision makers in the state.

The primary goal of this study is to evaluate differences in wild age-0 largemouth bass mortality, growth, and condition when small, closed aquatic systems are stocked with varying densities of age-0 hatchery-reared largemouth bass.

To reduce problematic aquatic vegetation and water quality problems in water bodies in Arkansas, to enhance the uses of these water bodies for the multiplicity of owner needs and desires, through use-appropriate management techniques that emphasize a holistic approach.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.5	0.0	0.5
2014	0.0	0.5	0.0	0.5
2015	0.0	0.5	0.0	0.5
2016	0.0	0.5	0.0	0.5
2017	0.0	0.5	0.0	0.5

V(F). Planned Program (Activity)

1. Activity for the Program

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 to 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. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● Demonstrations 	<ul style="list-style-type: none"> ● TV Media Programs ● Web sites other than eXtension ● Other 1 (Fact Sheets)

3. Description of targeted 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 mpoundments 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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Complete one peer reviewed research article every two years.
- 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.
- Complete one fact sheet regarding water quality, swine waste management or environmental stewardship each year.
- Number of project annual and final reports
- Number of presentations and scientific meetings
- Number of abstracts published
- Number of refereed journal articles
- Number of research reports submitted to stakeholders
- Number of non-peer reviewed publications
- Number of extension articles

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 204 - Plant Product Quality and Utility (Preharvest)
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 204 - Plant Product Quality and Utility (Preharvest)
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 4

1. Outcome Target

Database of changing water temperature in commercial fish ponds in Arkansas

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 5

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 6

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 7

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 8

1. Outcome Target

Number of research recommendations transferred to AGFC staff

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 9

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 10

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 11

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

Outcome # 12

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Competing Public priorities

Description

This project may be affected by extreme weather events. Rainwater runoff is factored into the environmental requirements for the swine waste treatment lagoon and constructed wetland cells. The lack of suitable rain events may have an adverse effect on the project's outcome. Changes in both state and federal water policy will also need to be addressed if they occur.

The slow economy has affected rural areas of the state as well, and pond owners are seeking economical control measures for problematic aquatic vegetation. Unfortunately, herbicides approved for aquatic use are generally very expensive relative to terrestrial herbicides, and homeowners are tempted to use unapproved compounds. Our educational programs have stressed biological control methods, the importance of following the label, and preventing measures to reduce nutrient inputs.

Temperature and sunlight will impact the use of a herbicide as a pre-emergent. If it is unusually cool, it might take longer for the phytoplankton bloom to become established. If this happens, then repeated herbicide treatments might be needed.

Political, public relations, and economic factors are involved in almost any management adopted by AGFC. Although all research is ultimately done to serve public interests, AGFC manages fisheries for the state of Arkansas. Dissemination of management research and other information, and eventual management actions are determined through the fisheries management process used by AGFC, that includes considerations other than biological fisheries science data.

Flooding has a major effect on natural fisheries studies, as it can prevent or limit sampling.

Natural disasters could result in the drying of some ponds. Extreme hot weather or extreme cold weather could affect survival of stocked and wild largemouth bass. The AGFC could change their approach to use of hatchery reared sport fish to supplement wild populations. They could decide to stock more hatchery fish or decide to discontinue stocking efforts. Either way, changes in public policy and public priorities could affect the outcome of this project.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The outcome indicators listed below will serve as the basis for evaluating the project.

1. Improve water quality in the UAPB Farm Pond with the use of the Constructed Wetland
2. Treat swine waste from the UAPB Farm in accordance with State Regulation Five of the Pollution Control and Ecology Department
3. Increase the number of small and limited resource farmers that use swine waste treatment practices (odor, water quality, solid and liquid waste treatment) as a result in our demonstration and training.
4. Increase the number of conservation practices utilized by swine farmers as a result of outreach and assistance provided by the project. Annual reports will record the progress of the project in meeting the project goals. Progress from year to year will provide a quantitative assessment of the projects effectiveness.

Post program surveys of district biologists and hatchery managers will be used to assess the impact of the program on the largemouth bass fishery in the Arkansas River. During 2012, we will conduct a census of relevant AGFC fisheries biologists involved with largemouth bass management in the Arkansas River. Also, key informant interviews will be conducted with four AGFC warmwater hatchery managers.

The research and extension program on aquatic plant management will be evaluated during the program. The numbers of attendees at extension meetings will be recorded along with their responses to surveys.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

The University of Arkansas at Pine Bluff (UAPB) serves primarily Small and Socially Disadvantaged Farmers (SSDF) in Southeastern and Southwestern Arkansas. This includes the well-being of the family unit. These farmers and their families have traditionally been underserved and they have lost more than 1.3 million acres ($1,457,904 - 155,441 = 1.302463$) of land since 1950. We chose to take a holistic approach to the sustainability of SSDF and their families because we believe that all segments of the population in this country must be active contributors in the fight to gain global food security and prevent hunger. The planned program will address issues such as U. S. Agriculture Policy (surveys of farmers, economic modeling and analysis will be done to determine the factors that affect SSDF participation in USDA programs); small farm management (Extension Associates will provide direct one-on-one assistance and group training on record keeping and financial planning to SSDF); assistance offered to farmers through USDA and other organizations (personnel will apprise farmers about programs offered through the Natural Resources Conservation Service (NRCS), Farm Service Agency, Risk Management Agency and Heifer International); animal production and management (alternative low cost feed sources will be used to formulate rations for swine, goats and beef cattle); alternative crop production (vegetables crop rotations, other crop production practices, screening of alternative insecticides and ornamental plant production will be the main foci), horticulture production (on-farm trials of fruit and vegetable crops will be conducted to determine their suitability for production by SSDF's), plant breeding, textile utilization and best management practices for crop production (conservation tillage verses conventional tillage, zero grade verses 0.1ft./100 ft. grade soybean production and round-up ready verses conventional soybeans will be the primary foci). This program covers most of the areas where our clientele are experiencing difficulty in being competitive in today's agricultural system.

The world population has exceeded 7.0 billion people. New, sustainable aquaculture production methods are required to support this ever-increased population, through production of food and income-producing crops. Channel catfish culture remains a major aquaculture crop in Arkansas, and provides a source of high protein, low fat seafood. Alternative fish species also show potential as additional sources of food and income. As with agriculture, food production through aquaculture involves much more than production, although production efficiencies are highly desirable. Economics, marketing, and health and water quality management all must be integrated into production systems for successful and sustainable operations. This integrated research and Extension program addresses these needs, focusing on improved management and marketing options to improve production efficiencies and lower costs, improved hatchery production efficiencies, alternative species, new split-pond production systems, and improving the disease status of aquaculture species through biosecurity and prevention, as well as rapid and accurate diagnosis.

3. Program existence : New (One year or less)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

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		5%		10%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants		12%		10%
205	Plant Management Systems		12%		8%
211	Insects, Mites, and Other Arthropods Affecting Plants		6%		0%
213	Weeds Affecting Plants		10%		0%
301	Reproductive Performance of Animals		5%		5%
302	Nutrient Utilization in Animals		6%		5%
307	Animal Management Systems		0%		10%
311	Animal Diseases		10%		7%
502	New and Improved Food Products		4%		5%
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%
701	Nutrient Composition of Food		4%		5%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures		4%		5%
	Total		100%		100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

There are over 5,000 small farms in Southeast and Southwest Arkansas. Most of these farms are owned by minority and limited-resource farmers. Additionally, over 87% of the farmers and their families are considered as small-scale (with less than \$250,000 in farm sales per year). These farmers have not benefited from USDA programs (direct payments, counter cyclical payments, market loan gains, conservation payments etc.) at the same rate as larger farmers. They face a great challenge in producing row crops because of the small profit margins in these crops (wheat, soybeans, rice etc.) meaning that farmers must have substantial acreage (1000 acres) in order to be competitive. Poor record keeping has plagued these farmers; their payments from USDA programs have suffered because they do not have adequate proof of yields; and must rely on county averages for payments which are based on acreage and

yield. The calculation for Direct and Counter-cyclical Payments is "base acres*0.833*yield history* payment rate". These facts are further exacerbated by the fact the SSDF's usually do not produce yields on par with larger farmers; and they are not comfortable with and/or do not trust USDA, or the Cooperative Extension Service (CES) or other agencies. They do trust UAPB's Extension Associates who have worked with them on an individual basis and in group settings since 1987. During this period, UAPB has helped more than 100 farmers stay in business. The Extension Associates explain the various USDA programs to SSDF's and help them to see how they can benefit from them. Good recordkeeping, financial analysis and following recommended crop production practices will be stressed when farmers are helped with loan applications by Extension Associates. Meat goats, small scale swine and beef production will be looked at as alternative enterprises because they have low capital investment in the start-up phase and the animals can utilize the abundant crop by-products available in southeast Arkansas. Horticultural crops (fruits - muscadine grapes, blackberries, blueberries etc., vegetables - sweet potatoes, green beans, cowpeas, squash, Chinese cabbage, hot peppers, bitter melon etc., and ornamentals - Gladiolus, hybrid roses, etc) will be used to help farmers diversify their operation and increase profits. Cowpea is an important alternative crop for SSDF esp. in the Arkansas Delta. It is susceptible to insects and diseases that can devastate the crop. Conventional plant breeding will improve market acceptability of cowpeas. Wheat, soybeans and rice are important cash crops for SSDF in Arkansas in spite of the fact the yield of these crops are less than that of larger farms. One reason for this is that SSDF's are usually slow to adopt best management practices such as land leveling, installing irrigation wells, liming, and adopting new technology such as transgenic varieties. Demonstrations at the UAPB farm site near Lonoke Arkansas will demonstrate BMPs that can be used by SSDF. Also, new end use applications for biomaterials including traditional fibers and new modified regenerated protein i.e. spider silk or cellulosic fibers in relation to aspects of sustainability of materials will be examined to generate ideas and new product concepts. The proposed program will help farmers and homemakers to take a holistic approach to enterprise development and farm management.

Arkansas is a leader in warmwater fish production, and aquaculture is an important source of jobs and income in the impoverished Delta. Research has documented a higher-than-usual economic multiplier for aquaculture production, given that fish feed ingredients and commercial feeds are produced locally, and ancillary equipment and supply industries have developed together with fish farms. Aquaculture farms are typically family operations or partnerships, and farmers depend heavily on the land-grant universities for research and extension work to sustain efficient and sustainable production systems. This same situation exists across the U.S. Nationwide, the vast majority of aquaculture operations are small businesses (90% sell less than \$500,000 annually), and 44% of farms have annual sales of less than \$25,000. This planned program provides integrated research and Extension support to help these family farmers improve farm business efficiencies, fish health and water quality, and hatchery and production methods.

2. Scope of the Program

- In-State Extension
- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

A holistic look at farm production will increase the likelihood that farmers will become better managers. Forays into the policy arena will help them to see that governmental policy has a profound impact on their ability to be profitable. SSDFs will learn what resources are available for them to improve their enterprise and be able to access those resources. They will learn that: 1. crop by-products can be an

economical source of animal feed; 2. crops will improve family and farm income while increasing food security of the area; 3. crop rotations and sequencing of vegetables during the growing season can increase yield while reducing insect and disease pressures associated with crop monocultures; 4. ornamentals, fruits and vegetables can be sold for a profit with health benefits being derived from consumers since consumption of fruits and vegetables have been shown to reduce the incidence of obesity and ornamental have been shown to add aesthetic beauty to the environment; 5. adopting improved cultivars and BMPs can increase profit margin and reduce inputs; and, 6. BMPs can increase yield, improve soil tilth, reduce soil erosion, and improve water quality in an area. 7. Manufactured and patented spider silk can be used in a variety of ways in the textile industry.

It is assumed that market demand for U.S. aquaculture products will grow, as consumers become more educated and selective in their choices of seafood. Subsidized seafood products imported from developing countries with relatively lax environmental, food safety and social responsibility standards have undercut markets for some U.S. farm-raised aquaculture products. However, consumers are increasingly interested in locally grown foods and product quality and safety.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to provide research based information that has been transmitted through Extension and outreach channels. This will enable SSDFs to improve their efficiency and become a viable part of USDA's effort to achieve global food security.

To provide consumers with healthy seafood produced by sustainable methods, through assisting the many family farms that produce these quality products to improve production and farm management efficiencies.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	5.0	0.0	6.5
2014	0.0	5.0	0.0	6.5
2015	0.0	5.0	0.0	6.5
2016	0.0	5.0	0.0	6.5
2017	0.0	5.0	0.0	6.5

V(F). Planned Program (Activity)

1. Activity for the Program

The activity for the policy part of the program will consist of surveying 250-300 farmers that are served by the UAPB 2501 Small Farm Project; economic modeling of the collected data, and disseminating

the results to farmers via workshops, publications pamphlets, newsletters, fact sheets, newspaper columns, and farmer meetings. Small farm management assistance will be provided by Extension Associates through direct one-on-one assistance, group training on record keeping and financial planning. Personnel will apprise farmers about programs offered through the Natural Resources Conservation Service, Farm Service Agency, Risk Management Agency and Heifer International. Training will be provided to county extension staff, master gardeners, small-scale and limited-resource farmers, and youth. Research will be done on alternative low cost feed sources that will be used to formulate rations for swine, goats and beef cattle. Research on vegetables crop rotations that are suitable for the Arkansas Delta and Southwestern Arkansas, screening of alternative insecticides and ornamental plant trials will be conducted. On-farm trials of fruit and vegetable crops will be conducted to determine their suitability for production by SSDF's. Plant breeding studies will be conducted on cowpea cultivars to improve their resistance to biotic and abiotic stresses. Best Management Practices for crop production (conservation tillage verses conventional tillage, zero grade verses 0.1ft./100 ft.). Research will be done to develop new end use applications for bio-fibers (linen, kenaf, soy, manufactured spider silk etc.).

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 Aquaflo.

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 finhgerlings will be tocked 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

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted 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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- The number of research studies and demonstrations conducted

 - The number of farmers provided assistance in applying for USDA programs
 - The number of newsletters, fact sheets, etc. distributed
 - The number of newspaper articles published
 - The number of field days held
 - Number of presentations made
 - The number of workshops and training sessions conducted
 - Number of refereed journal articles
 - Number of abstracts
 - Number of presentations
 - Number of trade magazine articles
 - Number of factsheets and newsletters
 - Number of peer reviewed journal articles
 - Number of publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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

Outcome # 1

1. Outcome Target

Increased economic opportunity and profitability for SSDF

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 302 - Nutrient Utilization in Animals

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Enhanced crop diversity on SSDF to increase profitability

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Financial impact of diagnostic services

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 7

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Value of aquatic animal exports requiring inspection and biosecurity assistance

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 9

1. Outcome Target

Number of hatcheries using improved or novel management practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1890 Research

Outcome # 10

1. Outcome Target

Number of stakeholders using results of marketing studies

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics

4. Associated Institute Type(s)

- 1890 Research

Outcome # 11

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

The economy has a profound effect on programs because without adequate resources programs must be curtailed and/or reduced. Personnel are generally reduced and resources to carry out programs are reduced.

Weather extremes can cause havoc with the agriculture sector as evidenced by the last growing season in Arkansas where excessive rain (> 81") caused crop and income losses in excess of 50%. The timing of the rain is just as important as the quantity of rain as evidenced by excessive rainfall during May August, September and October of 2009. Also, weather can affect disease transmission and insect populations.

Shifts in programmatic direction for an organization generally lead to a change in direction for programs. Generally some programs lose support and some programs gain support.

Programmatic changes generally accompany appropriation changes.

Catfish production in Arkansas declined dramatically due to external factors. However, there are strong signs of recovery and farmers are open to new innovations such as split-pond production. Program efforts will continue in support of family fish farmers.

Higher prices of catfish in 2011 resulted in a profitable year for catfish farmers. Farm profits have allowed farmers to begin to feed more and have more capital to make productivity - enhancing changes on their farms in 2012.

The economy has had a negative impact on aquaculture producers, particularly through a dramatic increase in the price of fish feed ingredients. Research on fish feeds that utilize alternative, lower cost ingredients is being conducted to address this need.

Appropriations changes have resulted in fewer funds to conduct research and extension programs to address rapidly changing circumstances, such as a new fish bacterial disease and tapeworm eradication. Some experiments are contingent on natural outbreaks of disease.

Bifenthrin is not approved for use in aquatic environments.

Growth of triploid hybrid striped bass would need to be examined to determine if it is faster than the hybrid striped bass.

Natural disasters could result in problems acquiring seed stock from wild alligator gar. The AGFC could change their approach to use of hatchery reared alligator gar to supplement wild populations. They could decide to stock more hatchery fish or decide to discontinue stocking efforts. If the USFWS decided to list alligator gar under the ESA, acquiring brood stock, seed stock, and restocking efforts could all be hindered. Furthermore, if the AGFC changes their alligator gar management plan, stock enhancement with hatchery alligator gar could be removed from consideration. Changes in public policy, government regulations, or public priorities could affect the outcome of this project.

We must have farm collaborators to conduct our studies. Some experiments are contingent on natural outbreaks of disease.

Drought or floods will impact private ponds. The regional economy will impact the pond owner's ability to manage the pond in the way they desire. Ex-stocking, sampling and weed control all require adequate funds. Need to use a pond for irrigation or livestock may change pond management priorities. Government regulations, like recent changes to the NPDES permitting process will impact weed control. Fortunately, Lacey Act rules against grass carp will have no impact on Arkansas ponds.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Face-to face evaluations /questionnaires/ surveys will be conducted on an annual basis to determine whether or not the socioeconomic status and awareness /understanding of SSDFs has increased. The number of households involved in home gardening and selling at farmers markets will be determined. Forage utilization by goats stocked at varying densities (number of goats per acre) will be compared and evaluated. Performance of breeding hogs and growing pigs fed varying levels of crop byproducts and supplemental rations will be compared and evaluated. The number of plants regenerated, the number of transgenic lines generated and the number of breeding lines generated will be reported. The number of best management practices adopted will be determined.

Surveys will be conducted during activities for fish farmers; the joint UAPB Aquaculture Field Day and fall meeting of the Catfish Farmers of Arkansas, and the spring meeting of the Arkansas Bait and Ornamental Fish Growers Association.

Numerical compare the drop in the number of annual cases of catfish with the "hot aeromonas" or compare the drop in the severity of the disease compared to the previous years.

Surveys of hybrid striped bass hatcheries and catfish farmers.

Annual reports will record the progress of the project at meeting project goals. Progress from year to year will provide a quantitative assessment of the project effectiveness.

Comparisons of the number of disease cases observed will be compared to the number of disease cases in previous years to determine if cases submitted are increasing or decreasing.

Post program surveys of district biologists and hatchery managers will be used to assess the impact of the program.

Electronic audience response devices are used to collect audience data during many of the biosecurity presentations.

Since you are dealing with private pond owners, the only way to evaluate results is by feedback from the pond owners, either positive or negative as to the advice received.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

Strategies to increase dairy products among Lactose Intolerant Students at the University of Arkansas at Pine Bluff

It is predicted that as many as 30 to 50 million Americans are lactose intolerant and as many as 75% to 95% of African Americans are predicted to be lactose intolerant to some degree (Annual Review of Genetics, 2003; 37: 197-219). Lactose intolerance is the inability to digest significant amounts of lactose, a sugar found in milk and many other dairy products, causing abdominal bloating, diarrhea, cramping pain and flatulence. Individuals with these symptoms often avoid dairy products resulting in reduced consumption of calcium and vitamin D. For example, most African American adolescents avoid milk and dairy products and consume inadequate amounts of calcium and vitamin D. Wooten and Price (2004) found that 83% of African American youth failed to consumer the recommended dietary reference intake of calcium and that real or perceived lactose intolerance was the prime reason of dairy avoidance.

Deficiencies of these two nutrients may predispose individuals to decreased bone mineral density, rickets in children, and later osteoporosis in postmenopausal women. There is a hypothesis that either reduced calcium intake or vitamin D intake is one of the factors contributing to obesity. Reduced-lactose products constitute an alternative source of these nutrients but are more expensive and less available than conventional dairy products.

In a survey of primary grocery shoppers aged 18 to 65 years old (NDP Concept Check, 2007) found those that identified themselves as lactose intolerant were willing to eat more cheese and dairy products assuming that they could avoid symptoms of lactose intolerance. Strategies to incorporate low-lactose foods in the diet while avoiding symptoms of lactose intolerance are:

- Eat small portions of low-lactose foods
- Consume dairy products with meals
- Select hard cheese such as cheddar
- Try cultured dairy products such as yogurt
- Read food labels carefully
- Note reaction to foods until tolerance level is determined.

Cheeses and dairy products with low lactose content are cheddar cheese, Swiss cheese, Mozzarella cheese, cottage cheese, half-half milk, butter, ice cream, and sour cream. African American students clinically diagnosed with lactose intolerance will be recruited. Personalized approaches based on strategies to incorporate low-lactose foods in the diet will be used to increase their dairy products consumption.

- 3. **Program existence** : Intermediate (One to five years)
- 4. **Program duration** : Medium Term (One to five years)
- 5. **Expending formula funds or state-matching funds** : Yes
- 6. **Expending other than formula funds or state-matching funds** : No

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		0%		20%
703	Nutrition Education and Behavior		0%		80%
	Total		0%		100%

V(C). Planned Program (Situation and Scope)

1. **Situation and priorities**

Approximately 60-80% of African Americans are affected by lactose intolerance (Sizer and Whitney, 2008). Individuals with lactose intolerance symptoms often avoid dairy products resulting in reduced consumption of calcium and vitamin D. Deficiencies of these two nutrients may predispose individuals to decreased bone mineral density, rickets in children, and later osteoporosis in postmenopausal women. Researchers think that deficiency either in calcium or vitamin D intake can contribute to obesity. Lactose intolerant individuals are willing to eat more cheese and dairy products assuming that they could

avoid symptoms of lactose intolerance.

2. Scope of the Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

1. Low-lactose foods can be tolerated by individuals with lactose intolerance
2. Increase consumption of dairy products among individuals with symptoms of lactose intolerance will result in increased calcium intake
3. Increase consumption of dairy products among individuals with symptoms of lactose intolerance will result increased vitamin D intake
4. Increase consumption of dairy products among individuals with symptoms of lactose intolerance will result in reduction of weight gain.

2. Ultimate goal(s) of this Program

Increase consumption of dairy products in African-Americans adults with symptoms of lactose intolerance.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	0.0	1.7
2014	0.0	0.0	0.0	1.7
2015	0.0	0.0	0.0	1.7
2016	0.0	0.0	0.0	1.7
2017	0.0	0.0	0.0	1.7

V(F). Planned Program (Activity)

1. Activity for the Program

Nutrition education program will be developed where students (12-20) diagnosed as lactose intolerant will be educated to increase their consumption of dairy products to 3 servings per day. Courses related to dietary guidelines, Foods and dairy products composition in calcium, vitamin D, and lactose; low-lactose foods; and strategies to increase dairy products will be taught. Group and individual approaches will be applied. Pre and post data will be collected to include dairy products intake, calcium and vitamin D intakes, weight, and symptoms of lactose intolerance.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Newsletters ● Other 1 (Annual reports)

3. Description of targeted audience

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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- 1.Number of participants in the education program
 - 2.Increase dairy products consumption
 - 3.Increase calcium intake
 - 4.Increase vitamin D intake
 - 5.Weight gain
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 Target

1. Number of participants in the education program

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

2. Increase dairy products consumption

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

3. Increase calcium intake

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

Outcome # 4

1. Outcome Target

4. Increase vitamin D intake

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

Outcome # 5

1. Outcome Target

5. Weight gain

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Other (limitations; students dropout)

Description

Natural disasters can disrupt the availability of participants and the course of the study. In addition, appropriations changes can affect the amount of money allocated to the project and, thus, its implementation. Another factor to consider is the recruitment of participants which can limit the number of participants in the study. Moreover, motivation of participants can affect the success of the study. Finally, students will be recruited to be participants in the feeding study. Any student who will drop from school will have to move out of campus and will be out of reach for the study.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

- During (during program)
- Before-After (before and after program)
- Comparisons between program participants (individuals, groups) and non-participants

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety in Aquaculture

2. Brief summary about Planned Program

Consumers in the U.S. have become more concerned with food safety in recent years. One manifestation of this has been growing concern over the safety of imported aquaculture products particularly catfish. As a result, the 2008 Farm Bill moved inspection of catfish from FDA to USDA-FSIS, into the same inspection program as beef and poultry.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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 (Situation and Scope)

1. Situation and priorities

USDA-FSIS has been charged with development of a rule for the Catfish Inspection Program. However, FSIS has no experience with catfish farming and processing because their programs to date have focused on beef and poultry. This planned program will provide a consistent support of science-based information to USDA-FSIS, related to the Catfish Program.

2. Scope of the Program

- Multistate Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The proposed Catfish Inspection Rule has been published for public comment. Once comments are received, the final rule will be drafted. Other political initiatives have proposed moving catfish inspection back to FDA, but the assumption is that some form of new inspection process will emerge none the less.

2. Ultimate goal(s) of this Program

To provide USDA-FSIS with a consistent supply of science-based information related to catfish farming, processing, risks, food defense, and vulnerability of imported catfish to contamination and adulteration. The second goal is to provide training and guidance to assist U.S. growers and processors to adopt to and meet the new inspection standards.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.2	0.0	0.0
2014	0.0	0.2	0.0	0.0
2015	0.0	0.2	0.0	0.0
2016	0.0	0.2	0.0	0.0
2017	0.0	0.2	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The 2008 Farm Bill included provisions to move inspection of catfish from FDA to USDA-FSIS. However, this provision has yet to be enforced. It has been hampered by a lack of understanding of production and processing practices of catfish in the U.S. and of basa/tra/swai in Vietnam.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● One-on-One Intervention ● Other 1 (regional and statewide meetings) 	<ul style="list-style-type: none"> ● Newsletters ● Web sites other than eXtension ● Other 1 (email to industry) ● Other 2 (trade magazine articles)

3. Description of targeted audience

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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Briefings to catfish farmers and catfish processors
- Number of presentations to catfish farmers and processors
- Number of emails, phone calls, and conference calls to catfish farmers and processors
- Number of newsletters, fact sheets, etc.
- Number of field days held
- Number of presentations made
- Number of workshops and training sessions conducted

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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 Target

Access to best-available science by USDA-FSIS personnel

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 2

1. Outcome Target

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. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components

4. Associated Institute Type(s)

- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Public Policy changes

Description

The Catfish Inspection Rule included in the 2008 Farm Bill has yet to be enhanced. Seafood importing and trade advocates have delayed its release.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Since the Rule has not been enacted yet, it is not possible to evaluate it.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

Rice is grown on over 148 million hectares worldwide with a total production of about 731 million tons of straw. Currently, rice farmers leave the rice straw in the fields, burn it or thrown away. But, if it is converted into a biofuel, it could provide an affordable, renewable energy resource. The conversion of straw into ethanol by fermentation of sugars derived from the cell wall is the preferred method to obtain liquid fuel. Since lignin inhibits the enzymes and microorganisms used to break down cell walls and make ethanol, it would be advantageous to decrease the lignin content of straw through genetic modification. A strategy based on down-regulation of lignin biosynthetic genes, cinnamate 4-hydroxylase (C4H), hydroxycinnamoyl CoA: shikimate hydroxycinnamoyl transferase (HCT) and coumarate 3-hydroxylase (C3'H), will be used to decrease lignin content in rice. We will only down-regulate these genes and not knock them out as the latter may have undesirable effect on rice plant in the field including resistance against diseases.

3. Program existence : Intermediate (One to five years)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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 (Situation and Scope)

1. Situation and priorities

1. Fossil fuels such as petroleum gas are getting expensive and fast depleting due to high consumer demand.
2. Effort, therefore, should be made to find alternate renewable resources that are capable of sustaining the high consumer demand.
3. Rice produces about 731 million tons of straw that the farmers either leave them in the fields, burn it or thrown away.
4. If rice can be converted into a biofuel, it could provide an affordable, renewable energy resource.
5. Since lignin inhibits the enzymes and microorganisms used to break down cell walls and make ethanol,

it

would be advantageous to decrease the lignin content of straw through genetic modification.

2. Scope of the Program

- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

By using gene silencing technology, it may be possible to partly silence various genes involved in lignin pathway to decrease the lignin content in rice

2. Ultimate goal(s) of this Program

- decreased lignin content in rice straw for efficient conversion of biomass to biofuel

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	0.0	0.1
2014	0.0	0.0	0.0	0.1
2015	0.0	0.0	0.0	0.1
2016	0.0	0.0	0.0	0.1
2017	0.0	0.0	0.0	0.1

V(F). Planned Program (Activity)

1. Activity for the Program

- Create gene silencing vectors
- rice transformation
- analysis of lignin content

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
• Other 1 (None)	• Other 1 (None)

3. Description of targeted audience

- rice farmers
- alternate energy users

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- - One peer reviewed publications
 - One abstracts in conference
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

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

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Field evaluation of transgenic lines may be affected by drought, flood and government regulations concerning GMO testing.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

We will use the following criteria to evaluate the program: the number of sense transgene constructs made for silencing, and number of transgenic plants regenerated after selection. Subsequent evaluation checkpoints will include the number of PCR positive transgenic plants, the number of Southern positive transgenic plants, the transformation frequency, the number of independent transgenic plants and the levels of gene expression/silencing.