2014 University of Arkansas at Pine Bluff Combined Research and Extension Plan of Work

Status: Accepted

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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 addressed 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 finding 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 Carotinoids 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 also addresses 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 emphasised among urban youth with workshops, camps and tours of the Small Farm Outreach and Demonstration Farm.

The upcoming 2014 University of Arkansas at Pine Bluff Combined Research and Extension Plan Of Work will include an additional program area and a change of name for an existing program area. The new program area will be entitled, "Global Food Security and Hunger - Aquaculture." The existing program area entitled "Global Food Security and Hunger" will be amended to "Global Food Security and Hunger - Agriculture."

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

Year	Extension		Research	
	1862	1890	1862	1890
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
2018	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. Seven 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 2013.

The Merit Review Process in the School of Agriculture, Fisheries and Human Sciences resulted 32 journal articles published, 19 accepted for publication, three book chapters, 12 Extension publications, 10 factsheets, 65 abstracts, and 25 manuscripts subsequently submitted for consideration in refereed journals. Over 60 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 MississippiState 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 has completed an accreditation self-study report for the Council for

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

The Agriculture Department received a favorable evaluation on the recent External Review which was conducted during the fall 2012 semester. The reviewers concluded that the Department has a qualified faculty that have the appropriate academic credentials. Eleven out of the fourteen faculty members have doctoral degrees (79%). The remaining three faculty members hold masters degrees. Program strengths include a strong faculty-student working environment, high student retention and graduation rates, qualified and experienced faculty member/researchers and an adequate University library support system. Areas in need of improvement included low numbers of students and graduates in the Agricultural Education option, low racial diversity in student population, small pool of agencies and industries that visit the University on career days, low student access to licensed veterinarians and a need for additional training for clerical support.

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 a 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 Aquaulture/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 Counsel 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 once a year; additional meeting may be scheduled contingent upon clientele and SAFHS needs. The AREAC is kept apprised of the Departments' programatic progress.

V. Planned Program Table of Content

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. Todays youth need the opportunity to better understand agriculture, its industry, and its communities. Researchers, policy makers the public in general continue to express great concerns for the health and well-being of American children and their families. Many children in this country grow-up in homes where their physical and emotional needs are not met.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, teenagr preganicies, and unemployment.. Experts predict that children growing up in these environments are faced with some tough odds to overcome.

Three programs will be integrated into the Families, Youth and Communities Program. These include the **Arkansas AG Awarness Adventures 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 Young Scholars Program,** in its 17th year of implementation, is a*n *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 34rd 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 then 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%		100%
806	Youth Development		55%		0%
	Total		100%		100%

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 tend to lag behind other children in their age range in school subjects such as math, science and reading. Research predicts that a high number of these youth will not finish high school.

The three focused programs, The **Arkansas AG Adventures Awareness 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
- In-State Research

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.

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, nutrition, math, engineering, and technology (**Arkansas AG Adventures and Awarness 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, 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
2014	0.0	1.3	0.0	0.2
2015	0.0	1.3	0.0	0.2
2016	0.0	1.3	0.0	0.2
2017	0.0	1.3	0.0	0.2
2018	0.0	0.0	0.0	0.2

V(F). Planned Program (Activity)

1. Activity for the Program

Three focused programs will be addressed in the Families, Youth and Communities Program. These include the **Arkansas AG Adventures and Awareness 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.***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 ***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
● Education Class ● Workshop ● Group Discussion ● Demonstrations ● Other 1 (Direct mail)	● Public Service Announcement ● Newsletters ● TV Media Programs ● Other 1 (Radio programs)

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),

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),and to increase understanding and awareness of agriculture as a scientific discpline 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),and to increase understanding and awareness of agriculture as a scientific discpline 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

Food safety is critical to the health and well being of consumers and beyond. While the U.S. food supply is considered among the best and safest in the world, the detection of outbreaks of foodborne illness associated with both domestic and imported fresh fruits and vegetables has been increased. The proposed study will focus on development of postharvest technology to improve safety of different food commodities. Postharvest technology will include the following: 1) decontamination on surface of food commodities by washing and sanitizing treatments, 2) application of edible films/coatings containing natural antimicrobials, 3) application of bactreiophage-based biocontrol strategies to reduce foodborne pathogens.

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 : 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		0%		25%
502	New and Improved Food Products		0%		25%
503	Quality Maintenance in Storing and Marketing Food Products		0%		25%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins		0%		25%
	Total		0%		100%

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

1. Situation and priorities

Development of techniques to improve pre- and postharvest food safety are essential. During 2008, the most recent year for which data are finalized, 1,034 foodborne disease outbreaks were reported, which resulted in 23,152 cases of illness, 1,276 hospitalizations, and 22 deaths. Despite the nutritional and economic benefits of fresh produce, issues of public health concern have arisen. The Centers for Disease Control and Prevention (CDC) reported that the top commodities to which outbreak-related illnesses were

attributed were fruits and nuts (24%) and vine-stalk vegetables (23%).

Sanitizers are substances that reduce the number of microorganisms to a safe level. Antimicrobial agents like chlorine (sodium hypochlorite solution) have been used to reduce the number of micrograms that may have contaminated the fruits and vegetables during minimally process. Chlorine is commonly used to sanitize for fresh -cut fruits and vegetables. Chlorine solution at concentration of 50-200 ug/ml can be used as sanitizers in fresh produce. However, chlorine usage can lead to the formation of potentially carcinogenic and teratogenic trihalomethanes as well as haloacetic acids.

Edible coatings are 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 are found to be able to extend shelf life of fresh-cut products by decreasing respiration and senescence , enchanting product appearance and protecting aroma, texture and color since they carry including anti- browning agents, colorants, flavors, nutrients, apices and antimicrobials.

There has been much recent interest in the use of phages as postharvest biocontrol agents of foodborne pathogens including Escherichia coli O157:H7, Salmonella spp and Listeria monocytogenes on meat, fresh produce, and processed foods.

2. Scope of the Program

- In-State Research

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

1. Assumptions made for the Program

Postharvest technology will help improve food safety issues by reducing foodborne pathogen contamination of different food commodities.

2. Ultimate goal(s) of this Program

This study focuses on effect of postharvest treatments to improve quality and safety of different food commodities.

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
2014	0.0	0.0	0.0	1.0
2015	0.0	0.0	0.0	1.0
2016	0.0	0.0	0.0	1.0
2017	0.0	0.0	0.0	1.0
2018	0.0	0.0	0.0	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

Commercially available sanitizers and natural antimicrobial compounds will be evaluated.

Edible coating containing natural antimicrobials will be evaluated.

Bacteriophages against Escherichia coli O157:H7, Salmonella spp and Listeria monocytogenes will be evaluated.

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Demonstrations	● Newsletters

3. Description of targeted audience

Local farmers, limited resource farmers, and state and federal agencies.

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	# of procedures, technology, and food commodity varieties adopted by public and private sectors

Outcome # 1

1. Outcome Target

# of procedures, technology, and food commodity varieties adopted by public and private sectors

2. Outcome Type : Change in Knowledge 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 food commodity production needed for the research.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluations studies will be conducted before, after, and during the projects. Comparisons will include against non-participating groups or commodities to evaluate improvement of safety of foods.

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 time 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 overfull 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.

Over 250,000 farm ponds are scattered across Arkansas. Many of these are under-utilized concerning fish production. A quality fertilization program can enhance many of these ponds, thus enhancing the family's food supply plus offer family recreational opportunities.

I will be focusing on building a youth fishing/outreach program based on competitive bass fishing throughout the state of Arkansas. This program will be geared towards encouraging high school students to consider college, and joining collegiate fishing teams. Not only will this act as a recruiting and advertizing tool for UAPB, but it will help encourage youth participation in outdoor sports.

With more than 300,000 private ponds in Arkansas, aquatic weed problems are a certainty. The ponds are used for recreation, irrigation, livestock watering and/or ascetics. Aquatic weeds can render a pond unusable. Providing advice and control plans will allow pond owners and managers to use their ponds for the activities for which they are intended

Educational programs on proper pond management techniques provide pond owners with the

knowledge to enhance both their quality of life and the environmental benefits of farm ponds. We work in cooperation with the Arkansas Game and fish Commission to provide research-based information and services to farm pond owners.

This program will assess the sportfish stockings currently being used on Arkansas state lake and othe water bodies. This research will support the Arkansas Game and Fish Commission (AGFC), a primary stakeholder of the UAPB Aquaculture/Fisheries Center, to refine their stocking practices for teh purposes of enhancing sport fisheries.

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.

Farm ponds are a vastly under-utilized resource in Arkansas

Fishing license sales have been down for many years in several states. Kids are not as interested in outdoor sports when easier or more stimulating entertainment can be had at the convenience of their own home; with video games being one of the stronger draws. A way to combat this is to introduce competition to outdoor activities. This has already proven successful in collegiate level competitions and is quickly spreading to high schools. The opportunity to compete and gain recognition for the school you go to, or the town you come from, is a strong draw to students.

Ponds with aquatic weed problems upset their owners and they will spend money and effort to correct a problem. In some instances, without proper information, ineffective and possibly illegal methods might be used to kill the weeds. This effort and money might be spent and the desired results still might not be achieved.

Arkansas has over 127,000 farm ponds that serve as important sources of water and recreation. In addition, ponds provide important ecosystem services by capturing sediment and sequestering carbon. 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.

Recreational angling is an important contributor to the economy of Arkansas, with an estimated total economic impact (2006) of $880 million. One component of management plans for a number of fish species important to recreational anglers is supplemental stocking of desired species. The Arkansas Game and Fish Commission (AGFC) manages one of the nation's largest warmwater hatchery systems. AGFC stocks more than 15 different fish species annually into Arkansas waters. Understanding the conditions and factors that result in successful stocking programs as well as those that hinder the success would provide useful guidance to AGFC.

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.

Producers will take advantage of the opportunities that are available

Students who are interested in competitive fishing will be more likely to make satisfactory grades because competition in collegiate and high school fishing tournaments often requires a 2.0, or better, GPA. Also, the desire to continue competing against other colleges and high schools will encourage students to stay in school until graduation.

Pond owners and managers will contact county offices or UAPB when they have a pond problem.

Program delivery is primarily through 1862 county extension faculty, and successful program implementation depends upon county faculty.

That this area of research remains an AGFC priority for a sufficient amount of time to complete needed research and produce useful results.

Studies will require a commitment from AGFC to provide oversight and appropriate control over experimental treatments (e.g., stockings) as warranted.

Any management recommendations from this research are subject to intra-agency approval and adoption by AGFC.

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.

The goal is for producers to better utilize the resource of the farm pond by improving fish production

To increase youth participation in the sport of bass fishing and recruit for UAPB

Pond owners will anticipate problems and have year round control plans in place. We will be contacted sooner, before a problem become large. Acting quicker and having a plan in place will reduce time, money and effort spent on a problem.

To enhance the quality of life of farm pond owners, to ensure that pond owners have research-based information to meet their particular needs, and that pond owners are aware of the environmental benefits of farm ponds.

The ultimate goal for this planned program wil be to enable AGFC to refine stocking strategies and better prioritize future stockings, with focus placed on waters that have better prospects for success.

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
2014	0.0	0.5	0.0	0.5

Year	Extension		Research	
	1862	1890	1862	1890
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
2018	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.

County agents will be encouraged to have pond owners submit water samples for analysis and offer workshops. One-on-one visits will be made to producers to visually inspect existing ponds and potential pond sites.

I will re-organize and manage an already established collegiate tournament circuit for Arkansas university bass fishing teams, the Arkansas Collegiate Series (ACS).

I will visit Arkansas high schools that already have bass fishing teams to meet with their members, encourage them to consider going to college and join collegiate fishing teams, teach valuable lessons in fish locating, presentations, public speaking tips, etc while focusing on drawing students to UAPB.

I will also make efforts to establish high school, and perhaps collegiate, fishing teams at schools and institutions that do not already have them.

Annual updating of the aquatic herbicide section of the cooperative extension publication MP44, Recommended Chemicals for Weed and Brush Control; annual weed and pond in-service for cooperative extension agents; presentations at Master Gardener, Wildlife, and other state meetings; article in Arkansas Aquafarming

Develop and provide research-based information to the public through county extension faculty and direct contacts, and through newsletter articles, extension materials, and presentations at meetings and workshops. Identification of problematic aquatic plants is provided, as it is essential for selecting appropriate control measures, and basic water quality analysis is also provided.

· Provided the studies are considered feasible by AGFC, we will conduct largemouth bass population assessments in selected waters, with special emphasis on the age-0 cohort.
· Attempt to fit standard stock-recruitment models as outlined above if feasible.
· Characterize system-specific abiotic and biotic conditions and incorporate these data into modeling to improve fit as feasible.
· Assess contribution of age-1 crappies to year class using hatchery crappie previously marked with OTC and stocked in AGFC lakes.
· Assess contribution of walleye to year class using hatchery walleye previously marked with OTC and stocked into Ouachita River and Beaver Reservoir.
· Model contribution of hatchery fish to largemouth bass fishery in Arkansas River under a variety of management scenarios using EnhanceFish software and existing data on Arkansas River largemouth bass.
· Other activities planned dependent on successful completion of above objectives.

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

Extension

Direct Methods	Indirect Methods
● Workshop	● TV Media Programs
● One-on-One Intervention	● Web sites other than eXtension
● Demonstrations	● 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 farm pond owners in Arkansas and those interested in developing new farm ponds

High school and college students interested in bass fishing

The target audience is Pond owners, pond managers, county agents

The main target audience is county Extension faculty. We also respond to direct contacts from small impoundment owners and natural resource managers. Many of the impoundments are less than ½-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.

Fisheries managers of Arkansas, Arkansas Game and Fish Commission (AGFC), AGFC fisheries biologists and managers, competitive and recreational anglers.

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 pubications
- 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	Good fertilization program that will increase fish production in farm ponds
4	Number of high schools teams visited
5	Student Participation in ACS Tournaments
6	Number of farm pond-related contacts with county faculty and the public
7	Water bodies free of weed problems that benefit their owners by allowing the pond to be used as intended
8	Number of fisheries biologists and other aquatic scientists that are informed of study results

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

Good fertilization program that will increase fish production in farm ponds

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

Number of high schools teams visited

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 5

1. Outcome Target

Student Participation in ACS Tournaments

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 6

1. Outcome Target

Number of farm pond-related contacts with county faculty and the public

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 7

1. Outcome Target

Water bodies free of weed problems that benefit their owners by allowing the pond to be used as intended

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 8

1. Outcome Target

Number of fisheries biologists and other aquatic scientists that are informed of 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

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.

Economics will have a bearing on outcome plus faulty facility design.
High school team adviser/coach interest in me visiting their clubs
Student interest in high school fishing events
Control methods can be expensive. Certain control methods might not be usable due to legal or other restrictions. Pond owners may not be able to assess the pond in a timely fashion, leading to responding to a problem rather than having a plan in advance.
Weather extremes

· 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, thus, we do not deliver our research or recommendations directly to the public. Dissemination of management research and other information, and eventual management actions are determined through the fisheries management process used by AGFC, of which we only affect the science component.
· Absence of sufficient resources, including a graduate student dedicated to this research would jeopardize achievement of project objectives.
· If AGFC research priorities change in the next few years, medium-term and long-term outcomes would change.

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.

Evaluation will be made on the number of producers who submit water samples for analysis or request information on the subject, particularly copies of MP360.

My goal is visit 5-10 schools in my first year. Any less than 5 will be viewed as a failure and my approach will have to be changed. Since this is the first year of this activity, I am not sure of the interest available.

County agents will be surveyed for needs and knowledge base. Requests for information tracked and responded to

County extension faculty (our primary target audience) will be surveyed regarding information needs, and level of satisfaction with program materials and other resources.

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

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger - Agriculture

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.

We will finish one more experiment related to pH stress on baitfish in this year. Most of the research efforts will be on data analysis and publication of research results.

Commercial production of baitfish is relatively inefficient. Feed comprise a major part of production costs. Baitfish production using lower-cost supplemental diets with alternative ingredients might be profitable due to their reliance on natural foods. However, density also has a major effect on growth of baitfish, so it is useful to compare diets under low- and high-density scenarios. Baitfish are marketed as live products, so hardiness and resilience must be considered in designing diets and feeding strategies for them.

Aquaculture production in Arkansas is primarily based on small family owned enterprises. These enterprises are supported by industry driven research priorities, extension workshops and meetings, farm visits, newsletters, e-mails, and phone calls. Public education is supported through school programs that deal with water quality, fish identification and production. Program planning is conducted annually, and during crisis periods, through discussions with individual farmers and with the Arkansas Bait and Ornamental Fish Growers Association. Results of research studies and extension programs are also shared with peers across the country at national meetings, scientific publications and other publications.

Aquaculture in Arkansas creates economic activity and jobs. To support family fish farmers, potential

producers, and the general public, integrated research and extension programs are being conducted. Activities consist of research studies in the laboratory and on the experiment station, on-farm research trials, extension farm visits, calls, e-mails, newsletters, workshops, and presentations. Water quality and fish health services are provided to support educational programs. Program planning is conducted through discussions with individual farmers and with the Arkansas Bait and Ornamental Fish Growers Association. Results of research studies and extension programs are also shared with peers across the country at national meetings and in journals and other publications.

The disease diagnostic and water testing programs will be maintained. Producers annually submit from 800 to 2,000 disease and water quality samples to the lab for analyses. The laboratory will continually stress the need for producers to maintain the bio-security programs that are in place on farms in Southwest and Southeast Arkansas with the goal to contain the spread of the virulent Aeromonasbacteria strain that appeared on farms three years ago.

Additionally, producers will made aware that the catfish trematode is still present in Southeast Arkansas catfish ponds after being absent the several years. On farm sampling will be conducted at critical farms to evaluate the severity of the problem.

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.

The split pond system (SPS) has been proposedas an alternative baitfish culture system for better production and disease treatment. Some progress has been made with prototype systems and several baitfish farmers are planning to adopt such systems on a commercial scale. Given this, a proper design andmanagement regimeneeds to be developed for the commercial application of the SPS to baitfish culture.

To hold fish for sale, local baitfish shops usually use expensive city water in flow-through systems, and are thus in need of efficient and cost-effective indoorbaitfishholding systems. Alternative holding systems for baitfish sale should be developed to reduce financial burden and decrease the chance of fish loss through the break-out of diseases.

For the past four years, legal methods have been researched for reducing the cost of treating submersed aquatic weeds in baitfish culture ponds. Initial research focused on using registered aquatic herbicides at low rates, added at the time of pond filling. Recent research has explored the use of registered agricultural herbicides applied to dried ponds prior to filling. The first year's indications were promising, but a second year of trials will hopefully give more definitive results.

Will provide assistance in the split-pond aquaculture verification program, super aeration study ponds, and other aquaculture species as needed. Assistance involves water quality analyses on weekly basis through grow out season plus assisting in harvest and stocking of the verification and study ponds.

Aquaculture production in Arkansas has declined in recent years. Most of the farms are small family owned businesses, which are supported by industry driven research priorities, extension workshops and meetings, farm visits, newsletters, e-mails, and phone calls. Public education is supported through school programs that deal with water quality, fish identification and production. Program planning is conducted annually, and during crisis periods, through discussions with individual farmers. Results of research studies and extension programs are also shared with peers across the country at national meetings, and through scientific and other publications.

Commercial production techniques for alternative species vary considerably relative to those for major aquaculture species. Often, lack of standardized production procedures stems from lack of specific scientific knowledge on alternative species. Feed accounts for $\geq$ 50% of production costs in intensive

culture of foodfish. Producers want species-specific diets to improve the profitability of their industries. Human consumers are interested in products that taste good and are beneficial for health. Use of diets with more plant ingredients would be environmentally sustainable, but must also be cost-effective.
Alternati

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.

Since we had the results from the previous experiments and monitoring, the following year's priority is to analyze the data and get it published.

High feed costs demand exploration of alternative diets and feeding strategies for farmed fish. The new diets and strategies must be profitable and environmentally sustainable.

Baitfish farming in Arkansas has an annual farm-gate sales value of $20 million. Farmed raised baitfish competes in the marketplace with wild caught baitfish, which is sold at substantially lower prices. In order to remain competitive, farmed raised baitfish must become efficient and reduce losses. Golden shiner losses in ponds prior to harvest are estimated at $1 million dollars annually. Identification of the cause for the losses would reduce the cost of golden shiner production. Additionally, goldfish eggs are hatched indoors in tanks. Goldfish eggs are sticky and the mats used for spawning substrate are quite

large. As a result 100 gallon tanks are used to place several mats in to allow the eggs to hatch. This requires substantial space and water and treatment of diseases of the eggs is difficult. Removing the eggs from the spawning substrate would enable producers to hatch the eggs in jars, which require less room and water enabling more efficient use of space and resources. Priorities are 1) to improve the efficiency of farm operations, and 2) to assist with fish health maintenance, and 3) to maintain the sustainability of baitfish farming.

Batfish farming is economically important to central Arkansas, with annual farm-gate sales of $20 million. Farm-raised baitfish substitute for the harvest of minnows from the wild; baitfish farming has been promoted by the public sector to reduce harvest pressure on natural ecosystems, and to ensure freedom from specific important fish diseases and aquatic invasive species (AIS). Baitfish operations are either family farms or partnerships, and the almost all farms are small businesses. As such, farmers cannot afford in-house research and rely upon the land-grant university. Farmers ship live fish to market across state lines, so that meeting fish health and AIS regulations of the various states is essential. Priorities are 1) to improve the efficiency of farm operations, and 2) to assist with farm-level biosecurity and fish health maintenance, to ensure that farmed products meet or exceed state and federal regulations, and 3) to maintain the sustainability of baitfish farming.

New virulent strains of disease have recently appeared on farms. If unchecked, these diseases have the potential to devastate the industry.

Losses to infectious and environmental diseases have a major impact on commercial aquaculture and are important in private ponds and in natural fisheries. Rapid and accurate diagnosis of disease problems is critical to the prevention of losses and to the control of aquatic pathogens.
1) One of the major considerations in the commercialization of the SPS for baitfish culture is retaining small baitfish within the fish unit while at the same time allowing an appropriate water flowrate. A practicalmethod of screening a sluiceway between fish and water treatment unitsin the SPSshould be developedfor commercial baitfish farms.
2) Baitfish heavily rely on natural zooplankton in their feeding. Zooplankton distribution in the SPS will be acritical parameter affecting the nutritional condition of baitfish, and patterns of the distribution should thus be observed.
3) A proper management regime for healthy baitfish culture, in terms of water velocity, dissolved oxygen, and nitrogen compounds, should be well-established within the SPS.
4) Local baitfish and live fish market shops share the same problems with their live fish holding systems. Existing holding systems use expensive city water in flow-through systems or are unable to maintain stable water quality in recirculating systems due to variable fish loading rates. This often results in a financial burden or chronic disease problem. Efficient andcost-effective indoorlive fish holdingsystems are thus greatly needed.

Submersed weeds in baitfish culture ponds have a negative impact on farm profitability. Finding solutions to this is of primary importance.

Currently, producers are struggling with profitability in the traditional aquaculture ponds due to high input cost, primarily feed and energy costs. Split pond aquaculture has been shown to drastically increase production compared to traditional methods of raising fish and may also offer economic advantages of improved feed conversion plus harvest, aeration, and feeding are concentrated to restricted area of the pond, thus may improve farm efficiency.

Due to rising feed and fuel costs and the importation of catfish species from other countries, catfish farming has declined by 60% in the state of Arkansas. New species are needed to fill niche mar

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. 8. Demonstrations will be conducted on improving pasture and livestock efficiencies

We assume the high pH in baitfish ponds affected survival of some early stage fry, but large sized fish may have higher pH tolerance.

New diets and feeding strategies can be successfully identified and implemented

The cause of fish losses in ponds can be identified and remedied and that a compound for desticking goldfish eggs from spawning mats can be identified.

The economic survival of baitfish farmers is dependent upon meeting multiple state and federal regulations. A major assumption is that new state or federal government regulations will not close markets.

It is assumed that producers will contact laboratory personnel when fish mortalities occur and heed the advice of the professional making the recommendation.

Producers will use the service for disease diagnosis, water quality testing and for certification of fish for interstate and intrastate transport.

1) Baitfish farmers can acquire a fundamental management regimefor baitfish culture with the SPS, which may increase productivity and disease treatment efficiency.
2) Properly designed SPS and sluiceway screens may promote sound culture conditions and prevent disease inbaitfish culture.
3) Efficient and cost-effective baitfishand live fishholding systems may reduce a financial burden and chronic disease problem faced by baitfishand live fish marketshops.

That current baitfish culture practices will remain relatively unchanged.

That laws relating to herbicide use will remain unchanged.

Assumptions are that the industry remains stable and that interest in split pond system continues to grow.

Sportfish production in the state is increasing.

Producers will change to a different species.

A market exists for alternative species.

New diets and feeding strategies can be successfully identified and implemented.

That farm land in Arkansas will be used for agriculture. That aquaculture will continue to be a major component of Arkansas agriculture. That farmers will continue to explore new species with a market potential.

The major assumptions are 1) that the regulatory burden facing fish farmers and potential aquaculturists will not inhibit the adoption of alternative aquaculture crops, and 2) that the dramatic increase in the price of fish feed ingredients will moderate and create a more favorable economic outlook for domestic aquaculture production.

Fish producers in the state of Arkansas and the remainder of the southeastern portions of the U.S. are in the midst of a technological shift as they are enhancing efficiency in the various stages of fish production. These practices require a novel approach to artificial spawning, fry and fingerling production, and transportation of live fish

We assume both the feed inputs and pond sediment contributed to the high ammonia in some intensively aerated ponds.

That producers and lenders will utilize this service that is available

Key assumptions for the program are that hybrid catfish fingerlings will be available for the study and that farmers will allocate the time necessary to complete the long-term business plan.

Since powering water circulators is indispensable to the SPS, water circulators could affect variable costs. The proper design of water circulatorswith engineering considerations might enhance the feasibility of the SPS. Catfish farmers may be provided with engineering criteria to retrofit their existing water circulators, and better understanding in the operation of the circulatorsand the management regime of the SPS.

Live fish haulers and hybrid catfish farmers may reduce fish losses during the transportation and the financial burden.

New diets and feeding strategies can be successfully identified and implemented.

Catfish farming will remain an important industry in Arkansas. That many catfish will be sold live and transported out of state.

Aquaculture and Fisheries Department in UPAB has conducted many feeding studies for both single batch and multiple batch studies over the last ten years and provided useful information for the power analysis.

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.

Identify the pH stress thresholds for major Arkansas baitfish species.

Increase and sustain the global competitiveness of US aquaculture

To assist baitfish producers in remaining economically viable and sustainable.

To support family farmers who carry out this economically important agricultural activity, to maintain and create jobs, and to ensure that baitfish farming remains sustainable.

The ultimate goal of this program is to see that the bio-security programs set in place remain in place. So far in Southwest Arkansas we haven't seen the Aeromonas strain spread beyond the original two farms on which the strain originated. This is despite the fact that producers in that area share harvesting and hauling equipment. We have been successful in this endeavor.

Provide rapid disease diagnosis and provide preventive measurements to producers

1) Design of the SPS and sluiceway screens for baitfish culture.
2) Development ofamanagement regime for baitfish culture, using the SPS.
3) Development ofanefficient and cost-effective indoor holding system for local baitfishand live fish marketshops.

That several control methods will be found that are economical, and can be used in alternating years or in conjunction, reducing the possibility of resistant plant strains.

The goal is to see more utilization of this type production system in the industry.
To assist aquaculture producers in remaining economically viable and sustainable in production of aquatic organisms.
Increase and sustain the global competitiveness of US aquaculture
The acreage of land in aquaculture production within the state will stay consistent or increase. The diversity in aquaculture species raised will increase, leading to healthy farm balance sheets.
To provide producers and potential producers with research-based information to support wise decisions regarding culture of new and alternative aquaculture species and systems.

Enhance hatchery efficiency for existing fish culture activity and the development of protocols for new hatchery techniques

Address the high ammonia and algae issues for catfish production
Improve the inventory management by the producer
The ultimate goal for the program is to develop production technologies that are more profitable than the current technologies, and to identify a marketing structure that will provide the catfish industry with greater market power.
1) Providing engineering designs of water circulators.
2) Development of appropriate operation conditions of water circulators in terms of rotation speed, projected area of paddles in water, and number of paddles and spokes.
3) Establishment of fundamental water quality dynamics and a management regime in the SPS for channel or hybrid catfish culture.
4) Investigation of causes of fish losses and development of a efficient transportation regime for hybrid catfish.
Increase and sustain the global competitiveness of US aquaculture

That state agencies would accept farm-wide semiannual inspections instead of requiring inspections of individual lots of fish headed out of state

The ultimate goal is to provide a valid and practical sampling plan for catfish researchers.

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
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
2018	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 a representative sample of the 250-300 farmers that are served by the UAPB 2501Small 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.Improving pasture and livestock efficiency demonstrations will be conducted.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.).

Data analysis and manuscripts writing

Conduct fish nutrition research and disseminate results to target audiences

Research activities focus on methods to reduce hydrogen sulfide concentrations in baitfish production ponds, and methods to destick goldfish eggs from spawning substrate. Extension efforts focus on water quality and dissemination of research materials to the producers.

Research activities focus on develop of new production system (split-pond) and on an indoor hatchery system for fathead minnows. Extension efforts focus on aquatic invasive species prevention, water quality and quantity, and regulatory issues.

Activity will include monitoring the diseases cases that come through the lab and being prompt in correctly identifying specific problem.

Prompt diagnosis of fish diseases, water quality analyses and routine health checks will be performed.

1) Active communication with baitfish farmers and research and extension scientists.
2) Development of research grants.
3) Development of a prototypeSPS with a sluiceway screenand field applications.
4) Public demonstration and presentationof research results.
5) Publication of research results in scientific journals.
6) Utilizationof research resultsas teachingmaterials.

Working with farmers to determine appropriate herbicides and then calculating rates and appropriate application methods.

Weekly visits to each verification ponds will be made where samples are collected for analyses. Additionally, stocking and harvesting will be given assistance.

Research activities will focus on commercial production methods of crappie. Extension efforts focus on dissemination of research materials to the producers.

Conduct fish nutrition research and disseminate results to target audiences

Updating the aquaculture alternative fact sheet. Answering requests for information. Helping current farmers of alternative species, particularly Arkansas turtle farmers.

Activities consist of research studies in the laboratory and on the experiment station, on-farm research trials, extension farm visits, calls, e-mails, newsletters, workshops, and presentations. Water quality and fish health services are provided to support educational programs. Program planning is conducted through discussions with individual farmers and with farmer associations (e.g., Catfish Farmers of Arkansas, Arkansas Bait and Ornamental Fish growers Association). Results of research studies and extension programs are shared with peers across the country at national meetings and in journals and other publications.

Data describing the efficacy of novel therapies to induce spawning will be collected and analyzed.

Evaluation of non-invasive strategies to evaluate annual reproductive cycles of finfish will include collection of digital images of catfish, largemouth bass and smallmouth buffalo.

Evaluation of hatchery fry, fingerling, food fish conditioning methodologies to enhance resistance to external environmental stress. This activity includes gaining an understanding of cellular machinery involved with the stress response, development and testing putative methods to induce favorable cellular responses, and finally assessing whole animal responses to treatment administered before exposure to acute physical and/or water quality changes.

Water quality and fish production monitoring

Activity will involve on farm visits where feeding of all ponds will be observed. Data will be analyzed and projections made.

Pond production studies

Long-tem business planning support

Continued committee meetings to identify and implement an improved marketing structure
1) Active communication with baitfish farmers and research and extension scientists.
2) Development of research grants.
3) Development of a prototypeSPS with a sluiceway screenand field applications.
4) Public demonstration and presentationof research results.
5) Publication of research results in scientific journals.
6) Utilizationof research resultsas teachingmaterials.
Conduct fish nutrition research and disseminate results to target audiences

Much of the time spent working with the catfish industry deals with health inspections for individual lots of fish destined for other states stocking programs. The fish are required to appear in good health prior to transport.

Data for catfish study in the past few years will be collected at various UAPB aquaculture and fisheries extension stations as well as through literature review. Power analysis will be used to assess and validate the required sample sizes for a typical aquaculture experiment. Power is the probability of rejecting a false null hypothesis. A power of 80% is recommended for research (if a difference is looked for) and 95% for validation (if there is no difference).

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● 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.

Baitfish farmers of Arkansas

Fish producers, feed manufacturers, researchers, recreational fishers

The target audience is commercial bait and forage fish farmers in Arkansas, Extension agents, and state regulatory agencies.

The target audience is commercial bait and forage fish farmers in Arkansas and across the nation. In

many cases, research and biosecurity/fish health programs are also applicable to sportfish farms, also an important aquaculture crop.

The audience is aquaculture producers in Arkansas and the state game and fish hatchery system.

Commercial producers of aquatic animals in Arkansas, private pond owners, county Extension agents, state agencies involved in the regulation or control of aquatic animal diseases.

Commercial producers of aquatic animals in Arkansas, private pond owners, county Extension agents, state agencies involved in the regulation or control of aquatic animal diseases.

1) Baitfish farmers.
2) Baitfish and live fish marketshops.
3) Public school teachers and students.
4) State-level, national, and international research and extension scientists.

Baitfish farmer owners, managers and employees.

The audience are current producers who want to improve farm production and efficiency and other land owners searching for alternative for land use.

Aquaculture producers, Extension agents, State agencies, small pond owners

Fish producers, feed manufacturers, researchers, seafood consumers

Current farmers, potential fish farmers, county agents

Program activities were targeted towards aquaculture producers, potential producers, and farm pond owners. 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.

The direct target audience includes commercial aquaculture entities and public agencies involved with the production of fish for enhancement purposes.

Catfish farmers in Arkansas

The audience is current fish producers and lending institutions in the area.

catfish farmers and processors

1) Channel and hybrid catfish farmers.
2) Live catfish haulers.
3) Public school teachers and students
4) State-level, national, and international research and extension scientists.

Fish producers, feed manufacturers, researchers, seafood consumers

Catfish farmers, live fish haulers, representative for other states.

The target audience are researchers in Aquaculture and Fisheries department as well as the catfish farmers in Arkansas.

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 abstracts
- Number of trade magazine articles
- Number of factsheets and newsletters developed
- Number of internally 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(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	Generation of new ideas/concepts for textile structures/end products from bio-fibers
7	Number of presentations, abstracts, publications, newsletter articles and other forms of delivery of research-based information to baitfish farmers,directly and indirectly
8	Number of scientists that learned what we know
9	Number of producers who learn project results
10	Financial impact of diagnostic services
11	Value of aquatic animals exports requiring inspection and biosecurity assistance
12	Number of alternative aquaculture-related contacts with producers, potential producers, and county faculty
13	Enhanced efficiency in hatchery management practices through the development of improved spawning protocols and hatchery management strategies
14	Number of catfish farmers using improved management practices
15	Number of completed long-term business plans

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

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

Outcome # 7

1. Outcome Target

Number of presentations, abstracts, publications, newsletter articles and other forms of delivery of research-based information to baitfish farmers,directly and indirectly

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 8

1. Outcome Target

Number of scientists that learned what we know

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals

4. Associated Institute Type(s)

- 1890 Research

Outcome # 9

1. Outcome Target

Number of producers who learn project results

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals

4. Associated Institute Type(s)

- 1890 Research

Outcome # 10

1. Outcome Target

Financial impact of diagnostic services

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 11

1. Outcome Target

Value of aquatic animals exports requiring inspection and biosecurity assistance

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 12

1. Outcome Target

Number of alternative aquaculture-related contacts with producers, potential producers, and county faculty

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 13

1. Outcome Target

Enhanced efficiency in hatchery management practices through the development of improved spawning protocols and hatchery management strategies

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 # 14

1. Outcome Target

Number of catfish farmers using improved 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 # 15

1. Outcome Target

Number of completed long-term business plans

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

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
- 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 Arkansaswhere 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 loose support and some programs gain support.

Programmatic changes generally accompany appropriation changes.

Regulatory agencies have dramatically increased the number of regulations pertaining to aquaculture. These regulations come at a financial cost to the producer and limit or decrease profits.

Changes in economic conditions may alter the ability to sell products or obtain loans necessary to farm operations. Changes in transportation regulations have made it impossible to move some species from state-to-state. This could happen in the future for new species

Regulations and government oversight are necessary and desired by U.S. citizens. However, an overly cumbersome and restrictive regulatory environment can stifle and constrain economic activity.

The stringency of the regulatory environment in the U.S. has increased in recent years in terms of both the number and complexity of regulations that affect U.S. aquaculture. The overall cumulative effect has been continued increases in the regulatory costs and risk faced by aquaculture growers in the U.S. Given the regulatory burden, fish farmers are reluctant to invest in production of alternative species. In addition, the economy has had a negative impact on aquaculture production given the dramatic increase in the price of fish feed ingredients.

power outage

Economics will affect the outcome. A crop cannot be produced without the economic input.

Overall relationship between catfish prices and feed prices may be such that catfish farming remains unprofitable even with improved technologies.

Natural disasters, economy, public policy changes, pandemic disease break-out, mechanic failure

Changes in the fish regulations of other states, changes in budgeting that impact stocking programs

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 weather or not the socioeconomic statue 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.

Baitfish farmers will be surveyed at the annual conference regarding information needs and satisfaction with program activities and direction.

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I will need input on methodology and available resources to do this.

Laboratory cases will used.

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.

1) Performance evaluation of sluiceway screens for commercial baitfish SPS

- Various configurations of sluiceway screens will be evaluated in order to ensure that they retain small baitfish in the fish unit and allow for efficient and appropriate water flowrates. Based on the results, field applications will be implemented with the goal of seeking out the most practicalconfigurations andoperation parameters for the sluiceway screens.

2) Development ofamanagement regime forbaitfish SPS

- Physical and chemical water quality requirements (water velocity, oxygen and nitrogen compounds) will be evaluated for baitfish culture with the SPS, andageneral management regime will be established for farmers.
- Zooplankton dynamics in the SPS will be observed in the different operations of the SPS.

3) Development of efficient and cost-effective indoor baitfish holding systems

- Alternative recirculating systems for holding commercial baitfish will be evaluated, using electrochemically re-usable ion exchange, photo-electrocatalytic oxidation or other applicable technologies to stabilize water quality with changes of fish loading rates.

Monitoring the target ponds will determine the viability of the control methods. Adoption of the methods by farmers will be monitored

Comparison of the number of cases submitted by farms for certification will be compared to the number of certifications in previous years to determine if cases submitted are increasing or decreasing.

Regulatory agencies have dramatically increased the number of regulations pertaining to aquaculture. These regulations come at a financial cost to the producer and limit or decrease profits.

Changes in economic conditions may alter the ability to sell products or obtain loans necessary to farm operations. Changes in transportation regulations have made it impossible to move some species from state-to-state. This could happen in the future for new species

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The stringency of the regulatory environment in the U.S. has increased in recent years in terms of both the number and complexity of regulations that affect U.S. aquaculture. The overall cumulative effect has been continued increases in the regulatory costs and risk faced by aquaculture growers in the U.S. Given the regulatory burden, fish farmers are reluctant to invest in production of alternative species. In addition, the economy has had a negative impact on aquaculture production given the

dramatic increase in the price of fish feed ingredients.

Ongoing studies examining the efficacy of each stage of artificial spawning to characterize bottlenecks in fry production, propose solutions, evaluate proposals, and distribute findings to stakeholders.

Continued evaluation of techniques to enhance stress resistance in fry and fingerlings. This research program has focused on the utility of the cellular stress response to effectively 'harden' fish to subsequent challenges. Heat stress is problematic in inducing protection and more benign methods will be evaluated. Research on copper sulfate indicates that this commonly used aquaculture compound may provide some of the benefits observed following heat treatments. The near term focus will be defining doses and durations of exposure that initiate stress resistance and develop quatitative markers that correlate with protection.

Ultrasound, surface mucus constituents, and respirometry techniques have been useful to provide insight on annual reproductive cycles and stress through less invasive testing strategies. During our research on artificial spawning of smallmouth buffalo we will employ these techniques in optimizing artificial spawning protocols.

We will evaluate the program by comparing water quality and fish production from different culture systems. We will also evaluate the farmers' willingness for potential adoption of the new systems.
Will make evaluations based on number of producers who have farms inventoried and the number of ponds inventoried.
Pond studies will evaluate multi-size stocking practices for hybrid catfish by understocking 5-inch hybrid catfish with those carried over from the previous year.
Economic analysis will be used to evaluate the effects or profitability.
Performance evaluation of water circulators being used for the SPS in Arkansas by acquiring field data - In order to gather information to retrofit the existing circulators in the field and improve the UAPB water circulator, the study will survey the operating status of the existing circulators in use commercially.
Performance evaluation ofthe UAPB water circulator relative tooperation parameters and power consumption.
- Power consumption of the water circulator can vary according to a number of operational parameters such as rotation speed of the water circulator, projected area of paddles in water, and number of paddles and spokes. Thus, the power consumption of the water circulator will be evaluated with the different operation parameters and will be coupled with water flow rate accordingly to develop an engineering model. Based on the results, field applications will be implemented with the goal of seeking out the most practicalconfigurations andoperation parameters for the water circulator.
Evaluation offundamental water quality dynamics and fish productionmodelin theSPS for catfish,or hybrid catfish culture.
- The study will also observe water quality dynamics and develop a management regime according to different production stages of catfish.
Evaluation of stocking density and water quality change effects to survival rate of hybrid catfish during the transportation

Surveys and individual feedback from farmers participating in the catfish heal

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 (college students) 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
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
2018	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
● Education Class ● Group Discussion ● One-on-One Intervention ● Demonstrations	● 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.Education sessions
- 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 growning 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 adapt 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
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
2018	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
● Workshop ● One-on-One Intervention ● Other 1 (regional and statewide meetings)	● 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 enacted. Seafood importing and trade advocates have delayed its release.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Short-term evaluation of this program involves monitoring the progress of developing the FSIS Catfish Inspection Rule, and other parallel, regulatory issues.

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
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
2018	0.0	0.0	0.0	0.0

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 publication/abstract 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, the levels of gene expression/silencing and lignin content in rice.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Global Food Security and Hunger - Aquaculture

2. Brief summary about Planned Program

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
301	Reproductive Performance of Animals		10%		10%
302	Nutrient Utilization in Animals		10%		5%
307	Animal Management Systems		0%		15%
311	Animal Diseases		20%		10%
502	New and Improved Food Products		8%		10%
601	Economics of Agricultural Production and Farm Management		10%		15%
602	Business Management, Finance, and Taxation		24%		0%
603	Market Economics		0%		15%
610	Domestic Policy Analysis		10%		15%
701	Nutrient Composition of Food		8%		5%
	Total		100%		100%

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

1. Situation and priorities

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 landgrant 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

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

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
2014	0.0	3.5	0.0	4.0
2015	0.0	3.5	0.0	4.0
2016	0.0	3.5	0.0	4.0
2017	0.0	3.5	0.0	4.0
2018	0.0	3.5	0.0	4.0

V(F). Planned Program (Activity)

1. Activity for the Program

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 cafish industry across Arkansas. Samples will be collected from the field when the disease cases occur. The samples will be incubated at the Lake Village Laboratory and shipped to UAPB for further diagnostic procedures. The goal is to develop techniques to rapidly identify the disease and to improve treatment success results.

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

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

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

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

- Number of abstracts
- Number of presentations
- Number of trade magazine articles
- Number of factsheets and newsletters
- Number of peer reviewed journal articles
- Number of research reports submitted to stakeholders

☐ 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	Financial impact of diagnostic services
2	Number of fish farmers using improved management (nutrition, water quality, stocking, production systems, economics, financial) practices
3	Value of aquatic animal exports requiring inspection and biosecurity assistance
4	Number of hatcheries using improved or novel management practices
5	Number of stakeholders using results of marketing studies

Outcome # 1

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 # 2

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 # 3

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 # 4

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 # 5

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

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

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 diseasters 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. Futhermore, 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

Surveys will be conducted during activities for fish farmers; the joint UAPB Aquaculture Field Day and fall meeting of the Cafish 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.