UNIVERSITY OF ARKANSAS AT PINE BLUFF
Pine Bluff, Arkansas 71601

School of Agriculture, Fisheries and Human Sciences
Mail Slot 4990 • 1200 North University Drive
OFFICE: (870) 575-8529 • FAX: (870) 543-8033

March 1, 2002

Partnerships/POW
Cooperative State Research, Education,
and Extension Service
U. S. Department of Agriculture
Stop 2214
1400 Independence Avenue, SW
Washington, D.C. 20250-2214

Dear Sir:

The FY 2001 Annual Report of Accomplishments and Results for the 1890 Research and Extension Programs at the University of Arkansas at Pine Bluff follows. Although this is a single submission from the 1890 institution, CSREES supported research and Extension programs in the state are planned and implemented in a comprehensive and coordinated manner. The 1890 and 1862 institutions in Arkansas have a history of program collaboration in defining issues and planning appropriate responses to eliminate duplication of effort, utilize the strengths of each institut ion, and provide maximum benefits to the citizens of Arkansas.

The administrative heads of both programs are committed to strengthening the coordination of existing programs and to engage in new areas of work that address emerging food and agricultural issues in the same spirit of collaboration and mutual respect.

Sincerely,

Jacquelyn W. McCray
Dean/Director

JWMcC/bjc

Enclosure

xc: Dr. Lawrence A. Davis, Jr.

Dr. Milo Shult

IMPLEMENTATION OF PLANS OF WORK (POW)
UNDER THE AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION REFORM ACT OF 1998 (AREERA)

2001 ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS

University of Arkansas at Pine Bluff

Contact Person:
Jacquelyn W. McCray, PhD
Dean/Director
School of Agriculture, Fisheries and Human Sciences
1890 Research and Extension Programs
University of Arkansas at Pine Bluff
Pine Bluff, Arkansas

March 1, 2002

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ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS

INTRODUCTION

The school of Agriculture, Fisheries and Human Sciences at the University of Arkansas at Pine Bluff (UAPB) includes three academic departments and the 1890 Research and Extension programs. The Department of Agriculture conducts research and Extension programs in agronomy, horticulture, animal science, and agricultural economics. The efforts of the Department of Human Sciences are directed towards human nutrition, food safety, and family life. The Aquaculture/Fisheries research and Extension plan of work is presented in a separate section (Part II) of this report.

The research and Extension programs at UAPB are designed and implemented to provide needed assistance and information to small scale and limited -resource farmers, disadvantaged families and youth. These programs have expanded greatly since their inception (research in 1967 and Extension in 19720). Greater responsiveness to clientele needs has resulted from CSREES formula funds and the AREERA mandated state matching funds.

STAKEHOLDER INPUT

Stakeholder input is a core component of all 1890 research and Extension programs at UAPB. The means for acquiring input varies depending upon the research or Extension program and the diversity of relevant stakeholders.

Systems for Obtaining and Reporting Stakeholders Input

The organizational structures of the three departments in the School of Agricultural Science are different. As such systems used in obtaining stakeholder input also differ. The overall structure of Stakeholder Input systems for each department is given below.

I. Department of Agriculture

Research in commodity areas pursued by faculty of the Department focus primarily on vegetable and small ruminant animal production. Agricultural economics research focuses on the financial status of farming operations and farm families. Although the scope of research in these areas is narrow, all are relevant in the context of the small and limited -resource farmer.

Stakeholder input is collected from individuals, commodity groups, advisory committees, and from Participants of the UAPB 2501 Small Farm Project. Collected inputs are used to develop future research initiatives and program directions. Each research scientist is expected to collect and process stakeholder input for their speciality area.

The type of data collected from stakeholders range from the responses to question and answer sessions at commodity meetings to formal evaluations developed for conferences. Clientele groups have initiated contact when they have had input to convey to the researchers and administrators. These types of stakeholder inputs are encouraged by the faculty. Researchers also solicit responses from readers of publications, responses from web page inquiries, and document exchanges.

Data from stakeholders are used in the evaluation process by means suitable to the type of data collected. Present reporting systems includes, trip reports, annual reports, telephone logs letters, e-mail, memoranda, and minutes of meetings. Researchers also obtain input from their peers from reviews of publications and response to presentations at State, Regional and National meetings. The evaluation of data collected is at the discretion of the individual with specific research area responsibility. However, the use of stakeholder input is expected in the justifications of new research initiatives. All research pre proposals (an internal document), are required to include stakeholders input as part of the justification. Researchers are also encouraged to have stakeholders involved in the evaluation process of projects.

Much of the initial stakeholder inputs into the research projects in progress were derived from a 1998 meeting in which a cross section of limited-resource farmers, members of the Arkansas Land and Farm Development Corporation (ALFDC) - a nonprofit organization designed to promote agriculture in South and Eastern Arkansas, and research and Extension personnel participated. The discussion was centered around delineation of research and outreach needs of the producers. Primary needs identified were: (1) recommendations on alternative corps and animal enterprises suitable for small-scale operations, and (2) development of economic models and enterprise budgets to assist in managing human and fiscal inputs of farm operations, and (3) establishment of production practice guidelines adapted to the soil and environmental conditions of Southeastern Arkansas.

Related to these need areas, modifications were made to the livestock management extension program to include applied research studies and demonstrations. Three research programs areas, alternative crop production, economic behavior of minority farmers, and small ruminate animal nutrition was developed. The entomology research program was modified to make it more responsive to the crops and potential crops of a clientele.

II. **Department of Human Sciences**

Research in the Department of Human Sciences includes the areas of human nutrition, child development, and family studies. Improving the physical, psychological, social and economic well-bing of individuals and families through education, research, and out reach is the Department's mission. Stakeholders or beneficiaries of human sciences research programs include the general public of the State of Arkansas. However, the targeted audience of the two research programs are breast-feeding mothers and their infants, and at-risk school children.

Other indirect stakeholders that will benefit from the projects are, healthcare professionals, Extension personnel, and others involved in the delivery of physical and psychological health information. These

stakeholders are instrumental in the identification of health and social problems that exist, and facilitate overcoming these barriers. Inputs from these stakeholders are generated through focus group discussions, meetings of the department's State Advisory Committee, and key informant surveys. A community readiness group that helps plan and coordinate activities periodically contacts community leaders via telephone, letters, and in-person at local events.
Participants in the studies are recruited through press releases, posters, brochures, and personal contact. Local physicians, educators, and other local stakeholders such as health department staff refer participants to the projects. All stakeholders are contacted regularly via letters, newsletters, and phone, to reassure their support and to solicit feedback. Other means of obtaining stakeholder input include the participation of researchers in local community events where research plans and results are presented. Ideas and feedback from attendees are solicited. Researchers also present scientific papers at State, Regional, and National meetings, disseminating information and obtaining feedback.

III. Department of Aquaculture and Fisheries

The University of Arkansas at Pine Bluff's Aquaculture/Fisheries Center encourages stakeholder input into its research, extension, and educational programs through diverse means and from a wide variety of audiences. Solicitation of stakeholder input is a continual, ongoin g process, and ranges in scope from formal reviews to individual concerns and suggestions.

In 1987, the University of Arkansas at Pine Bluff established a National Fisheries Advisory Council composed of local, state, and national stakeholders - to provide advice and guidance on research, extension, and education programs of the Aquaculture/Fisheries Center. This advisory council meets annually and consists of fish farmers, aquaculture industry suppliers, aquaculture association representatives, the state aquaculture coordinator, state natural resource agency representatives, and other university, state, regional, and national stakeholders, including elected representatives, and the press. Quarterly and annual reports of Aquaculture/Fisheries Center activi ties are also distributed to Council members.

The Catfish Farmers of Arkansas, Arkansas Bait and Ornamental Fish Growers Association, and Arkansas Farm Bureau Federation conduct formal annual reviews of UAPB research and extension activities. Stakeholder input is also obtained through formal and informal focus groups and through contacts with individuals, especially in soliciting input on programming needs for small farms and diverse clientele. Public extension activities, such as producer meetings, provi de opportunities for stakeholders to express needs and concerns. Aquaculture/Fisheries Center personnel also serve as speakers in schools and at meetings of fraternal, social, and service organizations. These meetings provide informal opportunities for stakeholder input.

Cooperative Extension Service (1862) personnel are stakeholders of the 1890 research and extension programs at UAPB. Input is sought through discussions with CES personnel and through in-service training evaluations by county extension agents.

Stakeholders also include research and extension scientists in other states, particularly as UAPB is an active participant in a large number of regional projects.

University of Arkansas at Pine Bluff faculty and staff are also stakeholders. The Aquaculture/Fisheries Center is composed of personnel with various extension, research and academic appointments, which meet and function in a unified manner, promoting a fr ee exchange of suggestions and concerns among the three components of the Land Grant mission.

By definition, stakeholders are "persons who conduct or use agricultural research, extension or education." As programs of the Aquaculture/Fisheries Center a re directed towards a wide range of audiences, so too are the means by which the Center seeks to identify stakeholders and solicit input.

A core group of stakeholders are those that define themselves as users of our programs through membership in a producer organization. Additionally, state and federal agencies with aquaculture and fisheries-related responsibilities are also key stakeholders.

In 1989, the University of Arkansas at Pine Bluff initiated development of a State Aquaculture Plan for Arkansas, culminating in the publication of the plan in 1990. Development of the plan was widely publicized and resulted in considerable input from diverse sources. The plan identified critical issues affecting the aquaculture industry in the state, and included key areas of research priorities and education needs. Appropriate areas identified within the plan were targeted for extension educational programs. The State Plan was re-visited five years later and was the subject of a series of focus groups to report progress and update recommendations.

Another means to identify stakeholders is through various mailing lists that are used to notify individuals of meetings and other activities. An Extension newsletter, "Arkansas Aquafarming", is produced by Center Extension personnel and is used to reach all individuals on county mailing lists.

Input from stakeholders is carefully considered and integrated into Center programming on several levels. The integrated nature of the Aquaculture/Fisheries Center, where resea rch, extension, and academic personnel work together, facilitates collaborative planning and action in response to stakeholder input. Extension personnel frequently raise stakeholder issues and concerns at monthly staff meetings and responses by the appropriate individuals are discussed. Program priorities and funds are allocated to a large degree based on stakeholder input. Personnel are encouraged to incorporate stakeholder input in the planning of future work. Faculty development plans (education), p roposals and experimental protocols (research) and annual goals (extension) are reviewed internally to maintain a focus on stakeholder needs. Some stakeholder suggestions can be accommodated using existing personnel and programs. Funding and research pri orities are proportioned among short, medium, and long-term projects, to not only assist with immediate problems, but also to help stakeholders prepare for the future.

In keeping within the framework of departmental stakeholder input systems, faculty are allowed latitude in determining appropriate methods of obtaining stakeholder input depending upon nature of the

Research or Extension Program. Specific means of gathering stakeholder input for the various programs are presented in the narrative for each program area.

MERIT REVIEW

Merit review is central to the University's goal of implementing quality programs that make a difference in the lives of people. Both research and Extension programs are monitored through the annual performance appraisal system to ensure adherence to this goal. Additionally, each department – Agriculture, Aquaculture/Fisheries, and Human Sciences – historically conducted separate reviews of research and Extension program proposals prior to their implementation. However, a new school-wide system for merit review was implemented in FY 2000. The system expands the current research peer review system to require a periodic external merit review process for all programs, as well as a school-wide peer review of all research proposals. The new system also clarifies expectations for scientific productivity that is monitored annually.

Merit review in Extension programs includes inter and intra institutional assessments of program quality prior to the initiation of new programs and an annual review of program accomplishments during the annual performance appraisal process. Additionally, all programs will undergo an external merit review every three to four years either via a CSREES review or by external evaluators invited by University administration. Each department or unit head is required to facilitate the review process.

A review team of four research and extension scientists from out-of-state universities conducted a peer review of the aquaculture/fisheries program in November of 1999. The Extension program in Family and Youth Development was reviewed by an external team in FY 2000. Both reviews were very positive and provided excellent input into program directions.

OVERVIEW OF RESEARCH AND EXTENSION PROGRAMS REPORTED IN THE 5-YEAR PLAN OF WORK BY GPRA GOALS					
Function	**Goal 1**	**Goal 2**	**Goal 3**	**Goal 4**	**Goal 5**
1890 Research Programs	1. Poultry Production and management 2. Crop Protection systems 3. Alternative crop production 4. Catfish production and management 5. Baitfish production and management		6. Herbs and vegetable production 7. Human nutrition and health	8. Integrated pest management 9. Small ruminant nutrition/ management	10. Economic behavior of minority farmers 11. Improving quality of life
1890 Extension Program Projects	1. Small farm/ Horticulture Management 2. Livestock management 3. Catfish production/ management 4. Baitfish production/ management	5. Nutrition education and wellness system (Food Safety)	5. Nutrition education and wellness system (Diet and Health)	6. Farm pond management and irrigation reservoirs	7. Family and Youth Programs Young Scholars •Adolescent pregnancy prevention •Drug abuse prevention •Parenting Education •Child care training

ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS - POW
October 1, 2000 - September 30, 2001

In two program areas, Agriculture and Human Sciences, research and Extension program are conducted and reported independently, while research and Extension are integrated in the Aquaculture/Fisheries area. In order to accommodate this diversity, this accomplishment report is presented in two parts. Part one includes stand alone program accomplishments in Agriculture, Community and Family Programs. Part two includes integrated accomplishment reports for the Aquaculture unit.

Part 1 - AGRICULTURE, COMMUNITY AND FAMILY PROGRAMS

Goal 1 An agriculture system that is highly competitive in the global economy

Executive Summary

During FY 2001 the 1890 agricultural research program supported the continuation of three research projects in agriculture production. The research projects were initiated to strengthen the production and management feasability of small and limited -resource operations. Many of the production practices generally associated with poultry and crop production suited to large scale operations are not economically feasible in low volume enterprises.

The poultry rearing density study (Research program 1) was terminated this FY and was dedicated to improving the efficiency of egg production. The crop pr otection system study (Research program 2) was designed to facilitate the use of 'non restricted insecticides to develop a crop protection system that would be easily adapted to our clientele. Alternative corp production (Research program 3) is a holistic approach to the production of selected vegetable crops, from planting to marketing, that will lead to a better understanding of the applicability of these corp to the economic system of small and limited - resource producers.

One integrated research and Extension program in agriculture was supported under goal 1, Family Small Farm/Horticulture (Extension program 1). The research in this project is designed to support the Extension activities. These activities include production of Extension information in l eaflets, newspaper articles, and presentations, etc. The field plots are also used as demonstrations and aids in making recommendations to farmers.

The livestock management project (Extension program 2) is directed toward increasing the efficiency of small cattle and swine producers. Demonstration and teaching of management practices suited to small herds and pasture systems for cattle and swine respectively, will increase the economic feasability of these operations.

Summary of Goal 1 Program Area Initiatives and Impacts

Goal 1 – Research Program 1 – Poultry Production and Management

a. Situation – Results of this study titled, "Effects of rearing density on age to sexual maturity and subsequent egg production of White Leghorns" indicate that cage reared birds seem to have higher egg production and better feed efficiency than floor pen reared birds; and that providing more than necessary cage space during the growing period does not enhance egg production, improve feed efficiency or improve egg quality. This research was terminated on March 31, 2001.

b. Impact(s) – Forty-four-week-old caged layers previously reared in spacious floor pens are not less fearful than layers previously reared in grower cages. The low bird-density during the growing period does not improve egg production or reduce fearfulness of the birds. Egg producers may reduce production cost by employing the medium bird-density housing during the growing period rather than the low-bird density housing.

c. Stakeholder Input Process – This research program was initiated in FY 96 prior to the stakeholder input requirement of AREERA in FY 98. Because of this, stakeholder's input was not solicited.

d. Source of Federal Funds – Evans-Allen 1890 Research - $56,180
Source of Other Funds – State Matching - $8,566
Other - $420

e. Scope of Impact – State

Contact Information -

Name: Kwang Lee, Ph. D.
Title: Professor and Associate Dean for Research and Extension
Affiliation: School of Agriculture, Fisheries and Human Sciences
Address: 1200 N. University Drive
Mail Slot 4990
Pine Bluff, AR 71601
E-Mail: lee_k@uapb.edu
Phone Number: 870-575-8133
Fax Number: 870-543-8035

Goal 1 - Research Program 2 - Crop Protection Systems

a. Situation - Research has been on-going to determine the effectiveness of "non restricted -used insecticides" (NRI) to control insect pest management system in the tomato. Various NRIs were mixed with the bacterial insecticide, *Bacillus thuringiensis* (BT) to determine if the mixes were effective in the control the tomato fruit worm, *Helicoverpa zea* (TFW). Tests results from the past 3 years have been inconsistent. However the results indicate a general trend that BT mixed with Sevin, and BT mixed with Garli c Oil have compared favorably with Asana® a commonly used insecticide by commercial producers which has a restricted use label.

Last year demonstration plots of heirloom, long shelve life varieties and varities from Asia were grown. In a field day the public was given the opportunity to see the plots and taste the ripe tomatoes. Potentially, restaurants and individuals will pay for premium prices for tomatoes that have reputations for good taste, i.e. heirloom varieties and Asian varieites or can be sto red for extended periods of time.

Combined with the tomato research are efforts to develop Insect Pest Management for fall greens (brassica type). Mustard, turnip, and collard greens were seeded after the tomato harvest. The same plastic covered seed beds with drip irrigation were used. Plots were established and evaluations made on the different germination characteristics of the greens. No serious insect infestations were note.

b. Impact(s) - Many gardeners and small farmers do not have access to restricted use insecticides. Purchase and use of restricted use chemicals requires training ,licenses, and continual certification. In addition, the NRIs have the reputation of not being as effective as restricted use insecticides. Determining which NRI mixed with BT is most effective gives growers a choice when attempting to control insects when they are causing damage to tomatoes. If growers do not have access to insecticides labeled "restricted use," the use of BT mixed with NRIs provides alternatives which are generally as effective as RI's but do not require the licensure to purchase and use. The NRI's and BT are considered less toxic and cause less damage to the environment than the restricted use insecticides, t hus the users have less exposure to toxic chemicals and a tool which can be as effective as the more toxic restricted insecticides.

Home growers and small farmers who wishes to develop speciality tomato markets were given the opportunity to see and taste different varieties at the 2001 tomato field day. This enabled them to view growth characteristics and make a more informed decision on which varieties might be planted.

Little information is available on the production of greens using plastic mulch and drip irrigation. Growers who wish to utilize mulches in the fall should be aware of the limitations in such a production system. Some varieties of greens do not germinate well in the plastic during the late summer. Vates and Georgia Collards as well as Curly Top mustard varieties were not suited to early plantings in plastic mulch. Growers planting early may have poor stands and have to replant, thus wasting time and resources.

c. Stakeholder Input Process- User input was obtained informally through conversations with producers, Extension Agents and other research scientists. Formal input was taken via a tomato field day. Some 15 varieties including varieties from A sia were shown and participants were given the opportunity to taste the ripe varieties.

d. Source of Federal Funds Evans - Allen 1890 Reserach $102,913
Source of other Funds - State Matching - $17,133

Contact Information -

Name: R. W. Katayama
Title: Professor
Affiliation: Department of Agriculture
Address: 1200 No. University Drive
Mail Slot 4913 - UAPB
Pine Bluff, AR 71601
E-Mail: katayama_r@vx4500.uapb.edu
Phone Number: 870-575-7245
Fax Number : 870-543-8543

Goal 1 - Research Program 3 - Alternative Crop Production

a. Small farmers account for most of the farmers in the U.S. while larger farmers account for most of the farm sales. Small farmers sell less than other farmers. This creates some serious financial problems for small limited-resource farmers. Farm programs and production technologies favor the larger farmers. Because of the small profit margin on traditional row crops, most limited-resource farmers are having severe financial problems. Application of appropriate alternative production practices (i.e. vegetables) is a possible solution.

Small limited-resource farmers are the major clientele of The University of AR - Pine Bluff's research and extension mission, and this project addresses three research areas in attempting to be responsive to their needs. Research areas addressed include:
Crop Production and Marketing–Economic feasibility analysis of alternative crops –southern-peas, greens and sweet potatoes. Also, feasibility of marketing alternative crops need to be assessed.
Crop Genetic Enhancement–Identification of southern-pea varieties that are high yielding under limited-resource farmer production practices, and are most appropriate for production and marketing in the form of fresh market peas.
Crop Agronomy–Production agronomic studies on southern-peas, sweet potatoes and greens for improved productivity under limited-resource farmer situations.

b. Impact(s) – Southern peas are one of the most profitable alternative crops to be grown by small and limited resource farmers in the South. However, many of these limited resource farmers do not use herbicide for weed control. Studies determined that there is economic value in using herbicide- Treflan (Trifluralin) for weed control. Tests were conducted on two varieties of peas at the UAPB experimental farm in 1999, 2000, and 2001. Yields of peas (fresh pod) were increased from 12 to 17% from using Treflan herbicide for weed control. On a per acre basis yield increases ranged from 17 to 21 bu/A. The level of response to herbicide use was also related to weed pressure in the test plots. Enterprise budgets developed for southern peas (fresh market (1999, 2000 and 2001)) indicated that average returns per acre were $866.67–Cornet variety and $928.32-LA Quick-Pick variety.

c. Stakeholder Input Process-- On July 30, 1998 farmer-participants in the UAPB 2501 Small Farm Project, met with faculty in the Department of Agriculture to discuss the specific needs of small limited-resource farmers in Arkansas. The Small Farm Project provides agricultural research/extension to 200-300 small limited-resource farmers in Arkansas.

Farmers indicated that some of their major constraints include: The acquisition of capital, decreasing output prices, and the need for enterprise budgets for vegetables (i.e. southern-peas, greens and sweet potatoes) that fit the small farm situation. This research program area was developed to provide probable solutions to some of these problems. Researchers continue to involve participants in the project through continuing formal and informal discussions.

d. Source of Federal funds– Evans-Allen-1890 Research programs– $147,975
Source of other funds– State Matching– $17,133.

e. Scope of Impact– Eastern Arkansas

Contact Information -

Name: Tracy V. Dunbar, Ph.D.
Title: Assistant Professor of Agricultural Economics
Affiliation: Department of Agriculture
1200 N. Univ., Mail Slot #4913
Pine Bluff, AR 71601
E-Mail: dunbar_t@vx4500.uapb.edu
Phone Number: (870)-575-7142
Fax Number: (870)-543-8543

Goal 1 - Extension Program 1 - Small Farm/Horticulture

a. Situation - The major goal of this program is to effectively demonstrate and disseminate workable programs, new emerging technology designed to save and increase small family farms in Arkansas. Conduct meaningful research, evaluation trials focused on ide ntifying improved variety, lower production cost and better cultural practices that will benefits all groups of farmers especially limited resource farmers.

Production meetings were organized with different cooperatives producing specific vegetable crops to address common production constraints, compare new released varieties, and discuss the pros and cons of new production practices. Displays, group talks and conferences were conducted at public places including agricultural expositions to inform and te ach farm safety measures, demonstrate chemical application standards and reemphasize old farming practices that works. Visual aids were used at civic centers, military reserve bases and other locations convenient to growers to demonstrate new emerging tech nology on producing and managing vegetable crops. Major news paper in South Arkansas were used by the Extension Specialist to disseminate regular articles on vegetable as a preferred alternative for farmers with small acreage of land and home gardeners. Collaborative efforts were developed with the personnel in alternative crop marketing to assist growers access markets with attractive prices. Original research on sweet potato was started at the University of Arkansas at Pine Bluff Agriculture Experiment St ation. Demonstration trials on major vegetable crops in Southeast Arkansas were set up at different locations in the state.

b. Impacts - the first year of this program created tremendous awareness and charged the growers with the increasing opportunities available to them producing vegetable crops. Record attendance at production meetings were increased by 50% compared to previous year 2000 in southeast and southwest Arkansas. Small family farms are increasing with fashion. Growers are increasing acreage from 5-8 acres last year to 26-acres on the average in Southeast Arkansas. Farmers are forming new production cooperatives (Hughes Vegetable Cooperative) and old ones are getting more organized, producing for major food processors and making progressive growth with better access to the vegetable markets.

Major newspapers in more than ten counties publish Extension Specialist articles on vegetables and provide information to more than ten thousand subscribers.

New Sweet potato varieties including “Rudy”, “Resisto”, and “Patriot” were more tolerant to insects and diseases under droughty conditions than other varieties. Better variety choice are now available 59% of limited resource farmers in Arkansas without ir rigation facilities. From old varieties tested; “Beauregard’ “Jewel” and “Hernandez”, “Beauregard” remained the highest yielding variety on the average with 28% higher than other varieties in all treatment locations. For the growers, these meritorious attributes ensure wide range of better varieties available, flexible cultural practices, lower production cost with better market prices for quality roots.

The high yield potential, better adaptability of “Golden Creaming”, “Excel”, and “Louisiana

Purple Hull" (Quick pick) pea varieties were evident by increased number of southern peas acreage in southeast and Delta regions of Arkansas. The double yield increase of "Golden Creaming" especially enhanced the farmers financial resources including hiring of human labor to maintain volume and consistency for the buyer.

Okra data showed hybrid variety including Green Best and Anie Oakely has a better performances and tolerant to low temperature. This tolerance has the potential to double the income of more than 65% of Arkansas farmers selling okra at farmers markets and trunk sale when they seed their okra early in the spring to take advantages of early market prices. Non-hybrid varieties including Clemson Spineless, Louisiana Green Velve t were shown to be high yielding but late maturing and better choices for commercial growers producing more than 80% of the fresh and canning okra market.

Numerous phone calls have been recorded from growers asking production questions concerning information read in Extension leaflets, newspaper article and agriculture expositions.

c. Stakeholder Input Process - In response to the accelerated decline of small family farms, heightened by the request of 2501 small farmers project participants in a June 1998 meeting, a multi disciplinary Alternative Crop Production program was formed. This program will address the cultural and management constraints of small acreage growers in Arkansas. The Extension personnel in companion with the scientists in research program 3, dialogue with each other and with the farmers to ensure that applied research and outreach programs developed are focused on producer needs.

d. Source of Federal Funds- $97,530
Source of other funds- $33,919

e. Scope of Impact- Eastern Arkansas

Contact Information-

Name: Steve Izekor, Ph. D.
Title: Extension Specialist
Affiliation: Cooperative Extension Program
1200 N. University
Mail Slot 4966
Pine Bluff, AR 71601
E-Mail: izekor_s@uapb.edu
Phone Number: (870)-575-8152
Fax Number: (870)-543-8166

Goal 1 - Extension Program 2 - Livestock Management (Animal production Efficiency)

a. Situation - The Extension Livestock Management Program provides producers with current technical information and best management practices.

Beef - Arkansas ranks fifteenth in beef cattle production in the nation. The Arkansas beef industry is basically a cow-calf business with all the calves moving west for backgrounding, feed out, and slaughter. The average herd is about 26-30 cows - a one bull unit. A vast majority of these operations are side line operations to an off farm job, other farming operations or it is a retirement occupation. The major goal is to increase the number of herds participating in Bull Breeding Soundness Exam Clinics (Bull BSE Clinics).

Swine - The Arkansas swine industry has grown and changed significantly in recent years. In 2000, 1,978 million hogs were sold from 1,100 farms in Arkansas (1800 head per farm). In 1988, 905,000 head were sold from 6,400 farms (141 head per farm). This represents an 83 percent decrease in the number of hog farms in the state and a twelve-fold increase in size. In addition, 98 to 99+ percent of these hogs are now grown under contract to one of the major integrated swine companies. When an operation is under contract, all management services are supplied by company fieldmen. The 1890 Extension Livestock Specialist is working with the University of Arkansas at Pine Bluff faculty and the 2501 Small Farms Project to develop a small pasture based demonstration swine unit. The unit will feature electric fencing and pasture plots for swine. The unit should be operational by mid-summer 2002.

The swine on pasture demonstration unit will be used to conduct field days on pasture units and as a training unit for individuals working with farmers interested in pasture operations. This program is designed to increase the number of small scale and limited-resource farmers adopting pasture-based systems for swine production.

b. Impact(s) - (Beef) - The Bull Breeding Soundness Exam Clinic (BSE Clinic) is a powerful management tool that weans out unsatisfactory bulls. Profits have increased through the use of more efficient production methods. Bull Breeding Soundness Exam Clinics (BSE Clinics) have been conducted in the southeast and south central areas of Arkansas in cooperation with the county Extension agents and large animal veterinarians. In some BSE Clinics conducted, about 15 percent of the bulls were classified as unsatisfactory for breeding purposes. The actual cost of replacing a herd sire that is not satisfactory for breeding purposes ranges from $1,000 to $2,000 or more. However, the value of identifying, removing and replacing these bulls before decreased calf crops and extended calving seasons are experienced is three to five times the actual value of the individual bull.

The number of clinics being held in south Arkansas has decreased over the last few years partly due to bad weather during the period of the year clinics are held and lower participation at some clinics. However, interviews with several veterinarians that have been involved in these clinics indicate many producers have begun having the breeding soundness exam conducted on their own farms instead of county clinics. This represents adoption of a major management practice on these farms and the success of an Extension program to improve "Animal

Production Efficiency."

c. Stakeholder Input Process - Outcomes of the 1998 Focus group discussion with limited-resource farmers led to the inclusion of the pasture-base swine demonstration unit in the Livestock program.

d. Source of Federal Funds - 1890 Extension Program - $ 139,432
Source of Other Funds - State Matching - $ 5,937

e. Scope of Impact - Eastern Arkansas

Contact Information -

Name: Dr. Robert J. Felsman
Title: Extension Livestock Management Specialist
Affiliation: Cooperative Extension Program
1200 North University Drive - Mail Slot 4966
Pine Bluff, AR 71601
Phone Number: 870-575-7214
Fax Number: 870-543-8166
E-Mail: felsman_r@uapb.edu

GOAL 2 - A safe and secure food and fiber system.

Executive Summary

One Extension Program, Families First-Nutrition Education and Wellness System (FF-NEWS) supports this goal. The project is funded primarily by the USDA Food and Nutrition Service. However, both state and federal 1890 Extension funds augment the program. No 1890 research funds are expended in this area.

The FF-NEWS Program in collaboration with a consortium of nine other 1890 institutions, is designed to help food stamp recipients improve the health status of family members and effectively utilize food resources. This culturally sensitive nutrition educat ion program pays specific attention to nutritional problems associated with southern, soul food, and Tex-Mex diets. The 44-week program encompasses four modules, one focuses exclusively on food safety. This module includes instruction on food handling, storing and appropriate food preservation and preparation techniques.

Funded largely from USDA: FNS, the program is in it's fourth year of operation. A primary outcome of the Food Safety instruction has been issuance of certificates by the University's Conti nuing Education Program. This certification has enabled some participants to find employment in food service establishments while other participants have used the certification for job advancement. Summary evaluations of behavioral changes suggest that the program is highly effective in promoting safe food handling and storage practices among participants.

Goal 2 - Extension Program 5 - Families First-Nutrition Education and Wellness System

(FF-NEWS) Food Safety

c. Situation - Food-borne illnesses are a major health and wellness problem. Consumer mishandling of food during purchasing, storing preparation, and serving contributes to millions of cases of food-borne illnesses annually. This is especially true of low - income families. A comprehensive program on food safety education can prevent contamination which causes food-borne illnesses.

The FF-NEWS Program is a multi-state partnership involving the University of Arkansas at Pine Bluff, Southern University and A&M College (Louisiana), Langston University (Oklahoma), Prairie View A&M University (Texas), South Carolina State University, Lincoln University (Missouri), Virginia State University, Tennessee State University, West Virginia State College and Tuskegee University (Alabama). FF-NEWS's food safety education program emphasizes personal cleanliness, proper ways to handle foods, sanitation in food preparation and storage, and kitchen sanitation. All of these factors are essential in preventing food -born illnesses. In FY-2001, FF-NEWS Staff made 713 contacts with local agencies for the purpose of developing partnerships, increasing client participation, and securing resources and technical experts to serve as guest speakers for the program.

d. Impact(s) - The major impact of the program has been increased awareness of food-borne illnesses and increased knowledge of appropriate food handling, storage, preparation and serving techniques. The staff conducted 256 in-depth educational sessions for food stamp recipients related to food safety and management practices; conducted 22 point-of-purchase demonstrations at local grocery stores and farmers markets; used 150 educational exhibits (prepared by staff and program participants) at county fairs, commodity distribution centers, faith-based organizations and medical clinics for program awareness. These exhibits attracted a number of potential clients of which 3,464 asked for additional information. The food safety classes reached 2,000 participants. Multi-county agents conducted grocery store tours to teach participants how to keep food safe when shopping to avoid cross-contamination of food. Pre- and post-evaluations indicate significant achievement of the target audience. Eighty percent of participants indicated that they have implemented food safety practices, thus reducing health risk of food-borne illnesses.

e. Stakeholder Input Process - Coalitions are established in each county where the program is implemented. The coalitions assist in identifying the target population and potential area for implementing and evaluating the program. Coalitions are made up with significant stakeholders including food stamp participants. Local healthcare representatives serve on the coalitions. A number of ways were used to identify stakeholders to ensure that diversity is achieved. Contacts are made with individuals who are knowledgeable about the community. Recommendations were sought from key leaders of various racial and ethnic groups. Meetings are held at times stakeholders can participate.

f. Source of Federal Funds - USDA - FNS - $28,621

Source of Other Funds - $ 38,382

g. Scope of Impact - Eight counties in the Delta Region of Arkansas

Contact Information -

Name: Dr. Jacquelyn W. McCray
Title: Dean/Director
Affiliation: School of Agriculture, Fisheries and Human Sciences and Research and Extension Programs
Address: 1200 N. University Drive, Mail Slot - 4990
Pine Bluff, AR 71601
E-Mail: mccray_j@uapb.edu
Phone Number: 870-575-8529
Fax Number: 870-543-8033

Goal 3 - A healthy Will-Nourished Population

Executive Summary

The health status of individuals and families is influenced by many factors. The availability of nutritious food and the knowledge to select and prepare these foods is the focus of one research program and one Extension program that addresses this problem area. Breast feeding infants has been shown to reduce illness. The promotion of breast feeding is being used to study the effectiveness of teaching methods and materials in changing the infant f eeding habits of mothers.

The project 'Herbs and Vegetables Evaluation and production' has began testing selected herbs, vegetables, and nutraceuticals for production requirements under Southeast Arkansas environmental conditions. A study of nutritional value of selected crops has been initiated, however, data are not available at this time. Some of the better known vegetable (pepper and southernpea) have increased in production acreage.

An increase in pe rcentage of mothers breast feeding their infants was shown in preliminary reports from the human nutrition study. If the level of acceptance can be maintained or increased significant impact on the general health of the community could be realized. The goa l of this program is not unlikely, because other healthcare educational group have shown interest in adopting similar programs.

FF-NEWS has the opportunity to make a significant impact on the health of the community by changing the eating habits of a large portion of the population. This Extension program had over 37,000 individual contacts during FY 2001. This is not taking into account the distribution of educational materials. This facilitated spread of information related to reducing health risk fa ctors by improving dietary practices Different methods, including demonstrations and exhibits to convey educational lessons to the targeted audience have been used.

Goal 3 - Research Program 6: Herbs and Vegetables Evaluation and Production

c. Situation - Disadvantaged rural and urban populations, especially individuals suffering from nutrition-related health problems such as hypertension, diabetes, obesity and arthritis, need help in improving their quality of life. Nutritional intervention through the int roduction of alternative food constituents such as special kinds of vegetables, herbs and nutraceuticals may alleviate the problems. Research designed to (1) identify suitable species/varieties of the special vegetables and herbs, including selected high y ielding and drought tolerant lines of southernpea, (2) determine their production potential and practices, (3) evaluate their nutritional qualities, (4) develop cooking methods and recipes that are acceptable to consumers can expand the production and use of nutritional and nutraceutical alternative crops.

d. Impact(s**)** - It is too early to see impacts of this project at the producer level. Results of the first-year studies helped identify several varieties of cucurbita vegetables that are adaptable to southeast Arkansas. Cooking and taste-testing exercises generated a lot of interests among participants in the development of new recipes for these health promoting vegetables. A number of promising new lines of hot pepper have been selected. A good number of individuals from Pine Bluff area and around showed interest in growing them when released as varieties. In a few years, some of the vegetables and peppers may be released for the general public for production as soon as the varieties are officially released. Two of the southernpea varieties, 'Texas Pink-eye' and Creamy Gold', have gained popularity among pea growers in southeast Arkansas. A survey will be conducted to estimate the increase in acreage for the new varieties.

e. Stakeholder Input Process - The project responds to input derived from the 1998 Stakeholder meeting during which a need for Alternative Crops was identified. The project was planned in consultation with the collaborating scientists from the University of Arkansas at Pine Bluff (UAPB) and University of Arkansas at Fayetteville (UAF). The research protocols and expected results were discussed in the beginning of the project and twice during the past year. The first-year's results were shared among the participants. Another meeting of the stakeholders including extension personnel and selected producers will be held in the summer 2002 to discuss the progress and prospects of the project.

An opinion survey will be conducted during the 2002 Agriculture Field Day to gather suggestions and points of interest of the stakeholders about directions of further studies

f. Source of Federal Funds - Evans-Allen 1890 Research $96,691
Source of other funds - State Matching $17,133

g. Scope of Impact - South Eastern United States

Contact Information -

Name: Dr. Mohammad Jalaluddin
Title: Professor
Affiliation: Department of Agriculture
1200 N. Univ. Drive
Mail Slot # 4913
Pine Bluff, AR 71601
E-Mail: jalaluddin_m@uapb.edu
Phone Number: 870-575-8117
FAX Numver 870-543-8035

Goal 3 - Research Program 7 - Human Nutrition and Health (Infant Nutrition)

a. Situation - Breast milk is the best nutritious feeding choice for infants and it has been recommended by many health organizations. Research on the benefits of breastfeeding is extensive. Breastfed infants are at lower risk of many illnesses such as ear infection, d iarrhea, allergies, obesity and Type I diabetes. Mothers also benefit from breastfeeding by the reduce risk of breast and ovarian cancers and by faster weight loss. However, there is still a large gap in practicing breastefeeding among women based on geog raphical and demographic characteristics. National figures revealed that breastfeeding has been practiced by around 60% of the women in the United States. On the other hand, data obtained from a local hospital in southern Arkansas showed that only 18% of the women who delivered at the hospital during 1997 did initiate breastfeeding. The Health Department reported a prevalence of 5-12% among women in south Arkansas and in the Delta region. There is a need to increase awareness about the benefits of breastfeeding among women in Southeast Arkansas to improve the quality of life for both infants and mothers. The Breastfeeding Education Study (BEST) addresses these needs.

The overall goal of the educational program is to test the impact of breastfeeding benefits and feeding techniques on increased beastfeeding of infants. The project is sensitive to mothers' education level and addresses cultural and social barriers to brea stfeeding.

b. Impact - 200 pregnant women were contacted. Fifty-seven percent of the participants were African Americans and 47% were younger than 20 years of age. Each participant in the intervention group (n=79) is required to attend three educational sessions. Two sessions are offered before delivery and the third is offered within the first month after delivery. The program covers many topics such as benefits of breastfeeding to both mother and infant, how to know if your baby is getting enough milk, how to latch on, breastfeeding positioning, dietary requirements of pregnant women, available local support groups, and resources and most frequently asked questions about breastfeeding. Strategies of delivery include lecturing, discussions, demonstrations, videos and role- playing. Personal home and hospital visits were made to the participants who requested special attention or counseling. During 2001, the program offered 20 educational classes to pregnant women. Thirty six pregnant women have attended class 1, 32 attended class 2 and 13 attended class 3. Nearly 100% of the participants who attended the sessions evaluated them as useful, and the overall score was between 4-5 on a Likert scale of 1 - 5. One means unsatisfactory and five means excellent. Preliminary results show that around 60% of the mothers in the intervention group initiated breastfeeding. Each month the mother breastfeeds, she saves her family approximately $130 in fo rmula costs alone. A breastfeeding mother on WIC eliminates the need to purchase approximately 15 cans of formula concentrate a month that her child would need (saving her family about $53 a month) The same breastfeeding mother receives carrots and tuna, and extra milk, cheese, cereal, juice, and beans from WIC while she exclusively breastfeeds her baby. No data are available at this time to estimate continuation of breastfeeding beyond 6 month.

c. Stakeholder Input Process - Input obtained from 57 women and 20 health care providers

during the focus group discussions conducted in the year 2000 was included in the developed curriculum. Thereafter, the developed curriculum was pilot tested where 10 pregnant women participated in its evaluation. During the year 2001, 200 pregnant women were contacted and were enrolled in the program. Women were recruited through announcements, press releases, newspaper announcements, posters, brochures and personal contacts. Local physicians, nurses, and health department staff referred many women to the program. Pregnant women were randomized into two groups (self –help and intervention). Participants in the intervention group evaluate each session offered and the curriculum is in constant modification to include their suggestions.

BEST succeeded in maintaining professional collaborations with local physicians and state health personnel where patients have been referred for consultations. Some of local physicians were co-authors on the submitted paper. The increase visibility of BEST was accompanied with increase awareness of breastfeeding. Many students on campus did request more information on breastfeeding. Oral and poster presentations were offered in churches and on campus. BEST also increased mothers' participation in the local breastfeeding support group (La Leche League).

Two OBGYN's participated in the 45th Annual Rural Life conference and presented a session on breastfeeding

A statistical consultant from M.D. Anderson in Houston TX and a Nutritional Anthropologist consultant were both hired on the grant to perform advanced analysis. This multi -institutional collaboration produced a paper and a presentation.

d. Source of Federal Funds: CSREES Capacity Building $101,688

e. Scope of Impact - Statewide

Contact Information -

Name: Dr. Sahar Zaghloul
Title: Professor
Affiliation: Department of Human Sciences
Address: 1200 N. University Dr.
Mail Slot 4971
Pine Bluff, AR 71601
E-mail: **Error! Hyperlink reference not valid.**
Phone Number: 870-575-8811

GOAL 3 - Extension Program 5 - Families First-Nutrition Education and Wellness System

(FF-NEWS) - Diet and Health

a. Situation - Obesity, diabetes, hypertension, and cardiovascular disease rank high among health problems in all racial groups, but general health statistics indicate that the incidence of these health problems are higher in the African-American, Hispanic, and Native-American population than in other population groups. In addition there is a high incidence in the general population of obesity suggesting that Anglo-American food stamp recipients would benefit from more healthy diets as well. The Families First-Nutrition Education and Wellness System (FF-NEWS) Program addresses these needs.

The FF-NEWS Program, a multi-state partnership, at first involving five 1890 land-grant institutions has now expanded to include 10 institutions: 1) the University of Arkansas at Pine Bluff; 2) Southern University and A&M college (Louisiana); 3) Langston University (Oklahoma); 4) Prairie View A&M University (Texas); 5) South Carolina State University; 6) Lincoln University (Missouri); 7) Virginia State University; 8) Tennessee State University; 9) West Virginia State College; and 10) Tuskegee University (Alabama). It is designed to help food stamp recipients enhance the health status of family members and effectively utilize food resources. FF-NEWS takes into consideration the obvious link between culture and food selection and preparation practices. Instruction is culturally sensitive and directs particular attention to risk factors associated with health problems. This focus extends the value and usefulness of nutrition education to the food stamp population served.

b. Impacts(s) - In FY 2001 contacts with food stamp participants and other low-income audiences exceeded 37,000. Staff made 713 agency contacts for the purpose of developing partnerships, increasing client participation, securing resources and technical experts to serve as guest speakers for the program; developed 5 culturally sensitive educational resources on diet-related health risk factors and distributed them to 4,677 food stamp recipients and other low-income families; conducted 400 nutrition educational sessions related to reducing risk factors for selected chronic diseases through improved long-term dietary practices and physical activity; conducted 30 point-of-purchase demonstrations at local grocery stores and farmers' markets; and used 150 educational exhibits (prepared by staff and program participants) at county fairs, commodity distribution centers, faith-based organizations and medical clinics for program awareness.

FF-NEWS staff had total contacts of 27,536 with food stamp participants through in-depth educational sessions. In cooperation with local health-care providers, FF-NEWS staff provided dietary guidance to 274 heads of households with family members who were experiencing health problems such as obesity, diabetes, hypertension and cardiovascular disease. Pre- and post-test assessment indicate that seventy percent of the participants have changed dietary behavior patterns. This is a major impact for this program. Participants indicate that they are eating more baked and boiled foods and less fried foods; selecting healthy snacks; including a variety of foods in the diet; balancing food intake with physical activity; eating more grain products, vegetables and fruits; improving and maintaining weight; eating a diet moderate in sugar and low in salt and sodium, fat/saturated fat, and cholesterol. With these changes, this population is more likely to reduce diet-related health risk factors and become a healthier population.

c. Stakeholder Input Process - Coalitions are established in each county where the program is implemented. The coalitions assist in identifying the target population and potential area for program implementation, educational thrust and evaluation strategies. Coalitions are made up with significant stakeholders including food stamp participants. Local healthcare representatives also serve on the coalitions. They provide a valuable service in teaching nutrition related information regarding specific health problems such as diabetes. A number of ways were used to identify stakeholders to ensure that diversity is achieved. Contacts are made with individuals who are knowledgeable about the community. Recommendations were sought from key leaders of various racial and ethnic groups. Throughout the year a file of news articles are maintained that showcase potential stakeholders. Meetings are held at times stakeholders can participate.

d. CSREES 1890 Extension Program $ 49,609
Source of Other Funds - State Matching $128,495

e. Scope of Impact - Eight Counties in Southeast Arkansas

Contact Information-

Name: Dr. Jacquelyn W. McCray
Title: Dean/Director
Affiliation: School of Agriculture, Fisheries and Human Sciences and Research and Extension Programs
Address: 1200 N. University Drive, Mail Slot - 4966
Pine Bluff, AR 71601
E-Mail: mccray_j@uapb.edu
Phone Number: 870-575-8529
Fax Number: 870-543-8033

Goal 4-An Agricultural System Which Protects Natural Resources and the Environment

Executive Summary

Two research programs were supported that address natural resources. The 'Integrated Pest Management' project investigated methods to reduce chemical use, and thus the environmental impact of pathogen control in crops. The integration of gene manipulated plants with resistance into the cropping system, will reduce insecticide requirements compared to trad itional production methods. The reduction in pesticide use should reduce cost by reducing the use of restricted pesticides. This technology must be evaluated in production systems used by small and limited -resource farmers. Results indicate no adverse reactions by non-targeted insects.

The small ruminant animal (goat) program attempted to introduce an animal enterprise that had less impact on the land compared to traditional animal systems. The small and limited -resource farmer has not shifted to high density animal productions systems. A pasture based system for goats would have less point runoff. Included in this research is the development of information on forage maturity and forage harvest dates for goats. This knowledge is needed to mitigate negative environmental impacts of integrating goats into a farming system.

Goal 4 - Research Program 8 - Integrated Pest Management.

a. Situation - Recent advances in biotechnology has lead to various methods of obtaining resistance to myriad plant diseases or predators through gene manipulation. This technology is being employed to alter vegetable crops that are grown by limited resource farmers. There is little data on the efficacy of these new varieties under field con ditions. Information on the effects such as time of planting, sampling design, methods for pest detection and the affect upon non - target species must be determined prior to full scale use by vegetable growers. Should these bio-transformed vegetables be used, are these new varieties necessary or beneficial in limited alternative agricultural situations? Studying numerous varieties of cowpeas, bio -transformed sweet corn, squash and other alternative crops offers a means of developing an integrated pest management sustem for limited resource farmers.

b. Impact - Preliminary results show that Zucchini squash that has been bio -transformed to acquire resistance to Zucchini Yellow Mosaic virus did not affect the abundance and distribution of squash bugs, striped cucumber beetles or spotted cucumber beetles. Thus, this technology does not appear to affect these non-target pest organisms. In addition, no other phytophagus insects exhibited irruptive behavior in these research plots. Sweet corn bio -transformed, by inclusion of the Bt gene in control corn stalk borers, appears to reduce corn ear damage. In addition, based upon the results of this study, the distribution and abundance of lady beetles was not affected. Thus, these helpful predators would not be adversely affected by this new technology. Should this new technology be adopted for vegetable production, there does not appear to be any adverse impact on non-target insects based upon these preliminary results.

c. Stakeholder Input Process- Research direction and emphasis was based upon regional cooperation for evaluation of new technology and from discussions with farmers in a 1998 Forum at the University of Arkansas at Pine Bluff.

d. Source of Federal Funds- Evans-Allen $127,127
Source of Other Funds - State Matching $17,133

e. Scope of Impact - Southern Mississippi Delta areas of Arkansas, Mississippi, Louisiana and Tennessee.

Contact Information-

Name: Dr. Joseph G. Burleigh
Title: Professor
Affiliation: Department of Agriculture
University of Arkansas at pine Bluff
1200 N. University Drive
Mail Slot 4913
Pine Bluff, AR 71601
E-Mail: burleigh_j@uapb.edu
Phone Number: 870-575-8151

Fax Number: 870-543-8543

Goal 4 - Research Program 9 - Small Ruminant Nutrition/Management

a. Situation - Many small and part-time farmers are continually looking for affordable and productive alternatives to costly large farming systems. Small ruminants, such as goats and sheep are affordable and have convenient body size for low-income farming systems. The small body sizes of sheep and goats enable the small farmer to stock greater numbers, and capital investments for equipment required in sheep production is less than that for cattle. Consequently, goats are becoming increasingly attractive to limited-resource farmers in southern Arkansas. Goats can also, utilize low-quality crop by-products to produce high-quality protein. In the U.S., goat farmers have small flocks or herds (50 or fewer animals). The nature of small ruminant production systems results is an environmentally friendly alternate enterprise for small and limited-resource farmers. Earlier completed research treated the use of goats and sheep to control weeds in agroforestry and orchards' systems. Specifically, this area of research is designed to: (1) increase the understanding of utilizing crop by-products as animal feed to reduce production costs and protect the environment, (2) develop strategies to determine the level of dietary supplementation required when feeding crop by-products to sheep and goats, and (3) document grazing efficiency incurred in a mixed grazing system. Objectives one and two have been, substantially completed. With regards to objective three, the first year finding of the research shows that by harvesting forage at the late flowering stage, the farmer will benefit from higher digestibility of the forage by the animals.

b. Impact(s) - (1) Utilizing goats and sheep instead of herbicides in management of weed s in agroforestry and fruits and nuts' orchards are environmentally friendly; the forest land provides shelter while weeds provide nutrients for the animals. Farmers that are adopting this practice would benefit from the savings from the spared nutrient purchases and a cleaner and healthier environment.

(2) The use of crop by-products (such as sorghum stubbles and cottonseed hulls) as feed supplements for sheep provide cheap sources of nutrients and bulk for the animals. Farmers are expected to benefit from spending less for large bulky feed. Farmers will realize higher benefits when feeding crop by-products as maintenance diet to mature animals.

(3) The State of maturity of forages before they are harvested and used as feed for animals would affect their nutritional composition and dry matter yield. Information collected from this exercise would enable farmers to know the right time to harvest forages for maximum bulkiness and nutritional benefits to the animals which translate to economic benefits for the farmers.

c. Stakeholder Input Process - Program responds to the need to evaluate alternative animal enterprises to integrate into small-scale farming systems identified during the 1998 focus group discussion with 2501 program participants.

d. Source of Federal Funds - Evans-Allen 1890 Research $30,256.

e. Scope of Impact - Eastern Arkansas

Contact Information -

Name: Dr. Dennis O. Balogu
Title: Professor
Affiliation: Department of Agriculture
Address: 1200 N. University Drive
Mail Slot 4913
Pine Bluff, AR 71601
E-mail: balogu_d@uapb.edu
Phone Number: 870-575-8154
Fax Number: 870-543-8035

Goal 5 - Economic Behavior of Minority Farmers

Executive Summary

Two research programs and one Extension program support the goal of understanding and improving the economic standing and behavior of minority farmers. The decline of minority farmers and the limited opportunities present for under educated minority youth highlights the need for these programs.

A better understanding of the economic behavior of minority framers (research program 10) could lead to more productive strategies for arresting land loss among minority framers. The elucidation of the problem surrounding economic stability would give the farmers a better base for making decisions relating to their operation.

Single parent homes a greater risk of producing children with low educational attainment. The Family and Youth Extension program (extension program 7) works with parents and youth to create a learning environment that will carry over into the home. The young scholars program targets children from the age of 6 through 16 with their parents having significant involvement in the program. Other programs include parenting education and Adolescent pregnancy prevention.

The research program 11, 'Improving Quality of Life', quantitative and qualitative data are being developed to support parent involvement in the education of their children. The results of this research should assist parents in understanding methods to use and the reasons for getting involved more actively in their children's education.

Goal 5 - Research Program 10 - The economic behavior of minority farmers

a. Situation - This study titled " The economic behavior and status of Minority farmers in Arkansas" was prompted by the fast decline of minority farms in the nation. The decline rate in Arkansas and other Lower Mississippi Delta states is higher than it is in the rest of the nation. This project seeks to provide a better understanding of the factors that contribute to the fast decline of minority farms. This information can be used in agricultural and economic policy aimed at sustaining minority farms.

b. Impacts - So far the project has contacted 815 farm households. 201 of these households have filled out the survey questionnaire. The project plans to get 300 complete survey questionnaires by the end of 2002. The project has also contacted 453 agents who work directly with farmers. 60 of these agents have completed the survey questionnaire. The project has completed data entry from all the 201 complete farm household questionnaires and the 60 complete agent questionnaires. These data will be analyzed in 2 002.

c. Stake-holder Input Process - The nature of this research project requires and includes stake-holder input through interviews of farm households and of agencies that work directly with farmers. The survey questions include the economic decisions and activities of the farm households and the farmers opinions about agricultural policy, i ts application and impact on farm households. The survey of agents seeks information on service delivery to the farmers. In order to ensure that the project got a reasonable sample of minority farmers, stratified random sampling was used. Based on the 1997 Census of Agriculture data, the project selected counties that have at least ten minority farmers. There are 31 such counties in Arkansas and the project is focusing on farm households in these counties. The project is also interviewing agents that work directly with farmers such as Cooperative Extension agents, Farm Service Agency, and agents from the National Resource Conservation Service.

d. Source of Federal Funds - Evans Allen 1890 Research $94,259
Other Funds $17,133

e. Scope of Impact - the Lower Mississippi Delta States

Contact Information -

Name: Ari Mwachofi Ph.D
Title: Assistant Professor, Agricultural Economics
Affiliation: Scholl of Agriculture Fisheries and Human Sciences
Address: 1200 North Univesity Drive
Mail Slot 4913
Pine Bluff, AR 71601
E-Mail: mwachofi_a@uapb.edu
Phone: 870-575-7143
Fax: 870-543-8543

Goal 5 - Research Program 11 - Improving Quality of Life

c. Situation - Educators across the country list the lack of parental involvement as a major problem facing schools. In disadvantaged communities with a high percentage of poverty, crime, teenage pregnancy, poor academic achievement, and school dropout rates, the lack of parental involvement is a major problem.

Research indicates that children are most successful academically when their parents are involved in their education. Without the benefit of parental involvement, many children are at risk of school failure. The fact that parents and teachers may have different definitions of parental involvement is a problem many schools face. According to research on parental involvement, educators see the following areas as important: reading to children, helping with homework, attending school functions, assigning regular bedtimes, participating in school decision-making, and maintaining regular communication with teachers. The purpose of this research is to obtain information about parent involvement in those areas from parents. We hope to assist parents in forging better relationships with schools by increasing parental involvement in areas that support the efforts of educators.

d. Impact - No impacts have been made as the project is in its initial stage of development. A survey has been developed and parents in Jefferson County Arkansas randomly selected to participate in the study. Special effort was taken to assure that an equal representation of parents across economic and racial lines were included in the selection process. Data collection began in February 2002. The research project started in October 2001 and will continue until September 2006.

An agreement with the Pine Bluff School District was established in May 2001 as support for the research proposal. Since then, the District has cooperated by providing a random selection of parents' names and addresses. In October 2001, a seminar for at-risk students at Jack Robey Junior High School, was conducted by the researcher and students majoring in Human Development and Family Studies at the University of Arkansas at Pine Bluff. One topic included discussions about parental involvement.

e. Stakeholder Input Process - Development of the survey has been concluded by taking into account low literacy levels of parents in the Delta region. Allowing parents in this region to provide input about parental involvement is of critical importance because many are typically underrepresented in many ways. Both quantitative and qualitative analysis will be used to collect data for this study. First, a survey will capture variables relating to parental involvement from parents. Second, additional data will be collected from parents and teachers who have agreed to individual interviews

Stakeholder input is the foundation of this research program. In addition to establishing excellent school-university relations and partnerships through this approach, the research study

will be among very few parental involvement programs that are research-based. Intervention plans are to be directly related to the needs of the parents and children. Thus far, the research project has experienced tremendous support from both parents, teachers and school administrators.

f. Source of Federal Funds - Evans-Allen 1890 Research - $17,001

g. Scope of Impact - Southern Arkansas

Contact Information -

Name: Shandra R. Terrell, Ph.D.,
Title: Assistant Professor
Affiliation: UAPB - Department of Human Sciences
Mail Slot 4971
Pine Bluff, Arkansas 71601
E-Mail: terrell_s@uapb.edu
Phone Number: (870) 575-8824
Fax Number: (870) 543-8823

c. Situation - Research predicts that children being raised without the support and presence of a father in the home are at greater risk of living in extreme poverty, using drugs, becoming a teenage parent, being involved in violent crime, and being incarcerated before they reach the age of 18. They will grow up with a deficit of the emotional and financial support they need to succeed. Many of these children will reach adulthood without the necessary skills to be contributing members of society. The vast majority of children in single-parent families are in female-headed household where they are more likely to be poor. This is especially true of minority children. Children from low-income, minority families frequently experience inadequate readiness for school and are at risk of repeating grades early in their school years. Many will later become school dropouts. The1890 Extension family and youth programs address these myriad issues. The Young Scholars Program, University of Arkansas at Pine Bluff through parental and community support is designed to reverse the poor academic trends of low-income, minority children, fortify their futures and fuel their family dreams; the parenting program empowers parents and child care providers to enhance the growth and development of children and adolescents; the 1890 adolescent pregnancy prevention program, which has an abstinence-based focus, is designed to stem the incidence of pregnancy among adolescents.

The Young Scholars Program targets low-income, minority children, ages 6-15 and their families. It is implemented in two Delta counties. The program promotes male responsibility with special emphasis on boys and their fathers/grandfathers and other male role-models. The children referred to as Young Scholars, meet five days a week, year-long in an after-school program. They are taught math and science concepts as they relate to horticulture, agronomy, nutrition, consumer education, clothing and textiles and housing and environment. Activities are provided to build social skills, reduce conflict, increase self-esteem and develop strong character. There are ninety-three (93) children enrolled in the program. In FY 2001they participated in a year-long leadership program developed by the Extension faculty at Prairie View A & M University and each was awarded a new bicycle and helmet. The bicycle had a plate attached with the inscription - Young Scholars Program, University of Arkansas at Pine Bluff.

The program reaches the entire family. The parents (75) organized into groups, meet once a week for one hour and must serve as volunteers to the after-school program. Their educational component includes the curriculum for the children as well as information on parenting, job related skills, career and personal development, stress management and coping skills, family relationships and economic and self-sufficiency skills. The Young Scholars Program is on-going. When the children reach age 16, they continue in the program as mentors for the other children. The first graduate of the program will enroll at the university in June 2002.

1890 Extension faculty trained 400 child care providers through a cooperative venture with Penn State University and the Arkansas Department of Human Services. Participants attended eight workshops that included: 1) Secrets of How to get Parents Involved; 2) Active Kids are Learning Kids; 3) Hot Topics for Center Directors-Legal Issues; 4) How to Make and Use Puppets; 5) How to Take the Stress Out of Care-giving; 6) What Brain Research Tells Us

About Infant Care; 7) When is Behavior OK or not OK?; and 8) Taking a New Look at Dramatic Play.

The 1890 Adolescent Pregnancy Prevention Program was implemented 23 years ago by the 1890 Extension family and child development specialist. She continues to serve as the primary instructor for the program. Started in 13 counties at first, the program is now state-wide. This abstinence-based program, a joint effort with 1862 Cooperative Extension, reaches public school students in grades 7-12. Special emphasis is placed on communicating with parents; building a positive self-concept; goal setting; understanding moral values; consequences of teenage pregnancy; and decision-making. The program has been evaluated by students, parents, teachers and school administrators who find the program to be significant in helping students make better decisions. TEENS ON THE GO, a bi-monthly newsletter series, was developed to complement the teachings in the program and to strengthen the decision making skills of youth. In FY 2001 the newsletter (with 6 issues) had 96,000 contacts with Arkansas teens. Each series includes an issue on drug- abuse prevention and teen sexuality. The issues last year included: 1) *Taming Jealousy- "The Green Eyed Monster,"* 2) *Dealing with Frustration,* 3) *"Ice" Shatters Lives,* 4) *Teen Pregnancy Prevention Programs,* 5) *Avoid Sexual Exploitation "On The Net,"* and 6) *Resolving Conflicts-Taking Charge of You.* Students evaluations indicate that they gained decision-making skills through the newsletters.

d. Impact(s) - A significant impact of the Young Scholars Program has been a major transformation of the children and families. Fifty-seven percent of the children have made the honor roll. They have achieved a high degree of maturity. They are well behaved and respectful of peers and adults and they are developing strong character traits including being dependable and trustworthy. The children now participate in a number of school and community organizations and activities. Many of the parents are now leaders in the school PTA and faith-based organizations. At the beginning of the program 80 percent of the families were on welfare. Today 95 percent of the families are working. Seventy percent of families are better managers of resources. Food is more likely now to last through the month. Some of the families are enrolled in money management saving programs. Another major impact of the program has been its ability to engage the total university. Faculty and administrators serve as guest teachers for the after-school program and instructors for summer day camp where they set up mobile labs in the counties. Day camp is designed to refine the skills learned in the after-school program. Community leaders attribute the decline in the community crime rate to this progra m.

Evaluations six months after the child care workshops indicated that participants have implemented a number of strategies for getting parental involvement, including regularly scheduled breakfast meetings, a parent bulletin board for information and awareness, offering parenting classes, providing opportunities for parents to volunteer and to participate in sunshine calls (a telephone call by the teacher to the parent to communicate praise and support for the child), and personal growth opportunities through establishing a lending library and problem-solving files (self-help information on a variety of topics) for parents. Eighty-five percent indicated that they are incorporating a number of best practices in child care in their curriculum. Directors are using family pictures to help parents feel a part of the program and to help the children adjust to being away from their parents.

Since the inception of the Adolescent Pregnancy Prevention Program, total contacts with Arkansas teens have exceeded more than 65,000. All of the original counties have shown a decrease in the birth rate to teens.

Two students at Sparkman High School had this to say about the FY 2001 Adolescent Pregnancy Prevention classes. The responses are typical of other 7 - 12 students in this school.

– This class has really made me think. It really makes you think of the consequences. I liked the emphasis on goal setting and understanding moral values. They give you a basis for making good decisions.

__ a student

– I have learned a lot in this class. You taught me a lot about sex. I now know how far to go and I have the tools now to say "NO." The class helped me to know what is really important to me. I know I will make better decisions because of this class. Thanks for caring about us.

__ a student

Students evaluations indicate that they gain decision-making skills through the newsletters. The following two responses from students are typical of what students say about the newsletters

– The newsletters are really great and made me think about a lot of things. They helped me in a lot of ways. First of all, I learned not to let my first reaction make my decision for me. Usually the people who write on these subjects do not view both sides of a situation. These newsletters are different; they show the positive and the negative. Thanks for all you do to help teens. I wish we could get TEENS ON THE GO more often.

__ a student

– These newsletters are great! Very understanding and inspiring. You get current topics that concern us teens. They help us to be safe. They help you develop an escape plan before something happens. I think parents should talk with their teens about these things.

__ a student

c. Stakeholders Input Process - A task force is formed in each county where the Young Scholars program operates to get stakeholder input. The role of the task force includes-identifying concerns at the community level; reviewing curriculum in reference to needs of the community; identifying target areas; referring participants to the program; identifying resources for carrying out the program; publicizing and promoting program; identifying funding sources and implementing and evaluating the program.

The stakeholders on the task forces represent a broad cross section of the people, including enrolled children and parents. One child serves as chair and another secretary of the task force. A number of ways were used to identify stakeholders to ensue that diversity is achieved.

Contact was made with a number of community persons who represent various racial and ethnic groups. A file of news articles showcasing potential participants is maintained. Task force meetings are held at times when stakeholders can attend and in locations where they feel comfortable. Minutes are written of each meeting that denote input given and actions considered. Stakeholders input is also received through follow-up surveys, and evaluations and merit reviews.

d. Merit Review - An external panel of individuals with the educational or Extension knowledge and skills to conduct the work reviewed the programs during the fall of 2000. The review team included a CSREES national program leader who served as facilitator. Two program parents also served on the committee. This review addressed multiple areas that cut across all programs representative of Goal 5. The review recognized the strengths of these programs and the impact on clientele and community.

e. On Source of Federal Funds - 1890 Extension Program - $ 294,531
Source of Other Funds - State Matching - $263,967
Other - $ 15,498

Contact Information -

Name: Dr. Irene K. Lee
Title: Associate Administrator-Programs
Affiliation: Cooperative Extension Program
Address: 1200 N. University Drive, Mail Slot - 4966
Pine Bluff, AR 71601
E-Mail: lee_i@uapb.edu
Phone Number: 870-575-7216
Fax Number: 870-543-8166

Evaluation of the Success of Multi-state and Joint Activities

The Families First-Nutrition Education and Wellness System (FF-NEWS) Program is a multi-state partnership involving ten 1890 land-grant institutions: 1) the University of Arkansas at Pine Bluff; 2) Southern University and A&M College (Louisiana); 3) Langston University (Oklahoma); 4) Prairie View A&M University (Texas); 5) South Carolina State University; 6) Lincoln University (Missouri); 7) Virginia State University; 8) Tennessee State University; 9) West Virginia State College; and 10) Tuskegee University (Alabama). It is designed to help food stamp recipients enhance the health status of family members and effectively utilize food resources. FF-NEWS takes into consideration the obvious link between culture and food selection and preparation practices. Instruction is culturally sensitive and directs particular attention to risk factors associated with health problems. This focus extends the value and usefulness of nutrition education to the food stamp population served.

The FF-NEWS partnership addressed these critical issues as they impact the health status of food stamp participants: 1) the relationship of diet quality to health status and age-related nutritional needs; 2) the relationship of food management skills of the primary care giver to improving the overall health status of family members; 3) the link between access to food and specific family characteristics that influence diet quality; and 4) the relationship of safe food handling and management practices of the primary care giver on the prevention of food-born illnesses in the family.

The FF-NEWS curriculum was developed with intent of long-term adoption and distribution. Curriculum modules were carefully constructed to ensure that they are technically accurate, user-friendly, appropriate for the reading level of the audience, and adaptable for use in a variety of delivery modes. A pretest of participants' knowledge of nutrition and food management practices is administered to all entering participants. The same instrument is administered as a post-test as the prescribed lessons or modules are completed. All pre- and post-test questions are maintained in a data file that is a component of the ff-NEWS data management system. The data file includes standard questions that are asked of participants engaged in any aspect of the program, a select set of questions for participants enrolled in a continuous series of lessons in either of the modules, and a question bank that allows the creation of customized pre- and post-test for audiences participating in special interest classes. This pre- and pro-test procedure allow assessment of changes in participants' level of nutrition knowledge, food related behaviors and skills and food management practices. Evaluation is continuous throughout the project. In addition to the pre- and post-test of participants knowledge of nutrition and food preparation and management skills, a general assessment of knowledge gained during each instructional encounter is obtained through open-ended survey items and a short evaluation check list. Data collection addresses the desired outcomes indicated in the behavior objectives. The compilation of evaluation data provides the foundation for assessing program effectiveness and results are incorporated into quarterly reports submitted to the Department of Human Services and the USDA Food and Nutrition Service.

Stakeholder input led to the development of a three-tiered population matrix that was introduced in FY 2000. It continues to be a successful method for increasing audience participation and continuation in the program. It is designed to satisfy the numerical expectation of the Food Stamp Nutrition Education Program while simultaneously satisfying the Extension objective of in-depth, sustainable education

programs that have lasting impact on the knowledge, skills and behaviors of the program audience (food stamp recipients). The levels of audience participation are used in counting program contacts and documenting program outcomes.

ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS

Part II - Aquaculture/Fisheries Research and Extension

PROGRAMS

Goal 1: An agricultural system that is highly competitive in the global economy

Executive Summary

Aquaculture/Fisheries Center research and Extension activities were developed in the two areas of catfish and baitfish production and management under Goal 1. Specific output from the 2001 programs included the following: 3 book chapters on baitfish feed ing, production, and management, 7 refereed journal articles on catfish and 7 refereed journal articles on improved baitfish production and management. There were an additional 12 catfish abstracts and 13 baitfish abstracts and 12 catfish research presentations and 13 baitfish research presentations. Four farms, four county agents, and seven ponds were enrolled in the catfish yield verification program. There were an additional 3,015 hits on the Catfish Yield Verification web site. More than 100 catfish producers and an additional 150 baitfish producers participated in demonstration activities. Of the producers who participated in educational meetings and listened to educational presentations, 324 were in catfish sessions and an additional 142 were in b aitfish sessions. Extension personnel further published 7 catfish articles in trade association publications and 4 baitfish articles in trade association publications. There were 26 Extension presentations related to catfish issues, 12 on baitfish issue s, and 16 farm pond presentations.

In all, the fish health program provides services to regions that produce more than $150 million/yr of food, bait, ornamental, and sportfish with customers worldwide. The diagnostics services saved the catfish and baitfish industries over $7 million in 2001. Successful verification of an effective treatment for high chloride toxicosis in catfish ponds has paved the way to minimize losses due to this syndrome through preventive actions. Development of production costs of catfish stockers are a first step towards a phased catfish production system with potential to improve farm productivity. Feed price boundaries were determined for catfish production to provide specific guidance on profit - maximizing feeding rates at different feed and fish prices. Improved fish grading technologies will reduce costs both for growers and for processors. New feed formulations resulted in far superior spawning performance over an extended period of time. This development will provide a m echanism to improve farm management by having additional options for spawning fish later in the season. Incubating fish eggs in tanks under controlled conditions was shown to be a feasible alternative resulting in dramatic increases in hatching success. In addition, research indicated that baitfish broodstock could be held indoors and induced to spawn early or late in the season, extending spawning. Effluent characteristics were determined on baitfish farms. Extension Specialists worked with the baitfis h farmers' association to develop a "Best Management Practices" guide to minimize the environmental impact of baitfish farming.

STAKEHOLDER INPUT PROCESS

Stakeholder input is a continuous process in the Aquaculture/Fisheries Center. In the early part of 2001, researchers and extension specialists devoted time to meeting with the respective trade and professional associations related to aquaculture and fisheries. These include the annual meetings of the Catfish Farmers of Arkansas, the Arkansas Bait and Ornamental Fish Growers Association, the Aquaculture Division of the Arkansas Farm Bureau, the Arkansas Chapter of the American Fisheries Society, and the Catfish Promotion Board. During these meetings, individuals have the opportunity to discuss research and extension programming needs with industry representatives. Several members of the Aquaculture/Fisheries Center are requested to meet with the respective boards of the major trade and professional associations in the state. The boards use this as an opportunity to discuss specific research and extension needs of their industry. Scientists and extension personnel then bring these needs back to staff meetings of the Aquaculture/Fisheries Center for discussion and prioritization.

Throughout the year, Extension specialists relay additional research and Extension programming needs to other faculty and staff through the monthly meetings of the Aquaculture/Fisheries Center. Since Extension faculty are integrated with research and academic programs within the Aquaculture/Fisheries Center, input into Extension activities and programming is also obtained from research and teaching faculty. The active fish health laboratories provide ample opportunities to discuss farm-level problems with growers and to identify research and Extension programming needs.

The National Fisheries Advisory Council is composed of local, state, and national representatives, to provide advice and guidance to the program. The Council members are selected to be certain to have adequate representation from all sectors of the aquaculture industry and to have representation of natural fisheries issues, problems, and priorities.

PROGRAM REVIEW PROCESS

All Evans-Allen research projects and manuscripts that are to be submitted to refereed journals for publication undergo an internal review. The reviewers sign a form to indicate when the manuscript is deemed ready to be submitted. In addition, the Aquaculture/Fisheries Center conducted an external review.

In November, 1999, Drs. Robert P. Romaire, Louisiana State University, Bill Simco, University of Memphis, Jimmy Avery, Mississippi State University, and Robert Durborow, Kentucky State University were invited to review the research and extension activities as a component of the Merit and Peer Review process of the Plan of Work of the Cooperative State Research, Education, and Extension Service (CSREES). Drs. Romaire and Simco were responsible for reviewing the research and teaching programs of the Department of Aquaculture and Fisheries and Aquaculture/Fisheries Center at the University of Arkansas at Pine Bluff. Drs. Avery and Durborow reviewed Extension programs and activities in the Aquaculture/Fisheries Center. Their report is appended to this annual report.

Several programmatic changes were made in response to the external evaluation. The Extension appointment of David Heikes was changed to provide for a greater time allotment for work on the fish grading equipment. Also, more research information is being included in the Extension newsletter that is published. The web site for the Aquaculture/Fisheries Center is under expansion and will include more

research summaries and information.

SUMMARY OF GOAL 1 - Program Initiatives and Impacts

Research and Extension Projects

Research Program 4 - Extension Program 3 - Catfish Production and Management

Overview

Research

Catfish research in 2001 focused on five main problem areas identified by stakeholder groups: fish health, aquaculture engineering, production economics of catfish production and of treatment alternatives for pond effluents, water quality management, and fish nutrition. Specific studies conducted in 2001 included:

c. Economics of producing different sizes of catfish stockers on growout farms.
d. Economics of alternative treatment options for effluents from catfish ponds.
e. Development of in-pond grading technology for commercial aquaculture.
f. Row crop herbicide impacts on fish pond water quality.
g. Fish disease research and diagnostics.

Overview

Extension

Catfish Extension programs conducted in 2001 included programs in the areas of fish health, catfish yield verification, technical assistance for new catfish producers, demonstration of the new in -pond grading technology for fingerling producers, financial management of catfish farms, and with EPA information collection requests.

The rapid growth of the catfish industry in southeast Arkansas leveled off in 2001. Expansion slowed due to declines in the farm price of catfish in response to dramatic increases in imports of a Vietnamese fish that began to be imported under the name of "catfish" in 2000. The economic downturn in 2001 further depressed farm prices of catfish. Extension assistance provided by the UAPB Aquaculture/Fisheries Center switched its emphasis from providing financial planning assistance to prospective catfish farmers to intensive financial analysis of existing farm operations to improve financial management during times of low prices. A spreadsheet-based template for farm financial analysis was developed and made available to farmers through a workshop and through the diagnostics laboratories.

Overall, the UAPB Aquaculture/Fisheries Extension program assisted over 53 individuals with farm financial planning in 2001 and provided 10,270 individual contacts with new and existing growers.

Project 1 - Economics of producing different sizes of catfish stockers on growout farms

Impact Area - Research

c. Situation-Catfish growers understock fish in multiple batches to be able to meet cash flow obligations. Larger understocked fish are thought to survive better, grow faster, and reach market size sooner, but are more expensive to purchase to stock into growout ponds. Smaller understocked fish cost less but grow more slowly, take longer to reach market size, and are thought to have lower survival in multiple-batch ponds. In order to determine the most profitable size of fish to understock, both the costs and the value of different sizes of fingerlings must be determined. Adding a stocker production phase to a catfish farm may have potential to achieve additional production efficiencies, but little data are available on the production characteristics and costs of producing stocker catfish.

Two pond production studies were conducted. The first study stocked fingerling (3-in) catfish at either 20,000; 40,000; or 60,000 fish/acre. The second study stocked either 3-4 inch or 5-6 inch fingerlings at 40,000/acre. Gross and net yield, feed conversion ratios, survival, growth, harvest size, and costs were determined for each treatment.

d. Impact(s)-The stocker production studies documented the costs and risk associated with each treatment alternative considered. The stocking density of 40,000/acre for the 3-inch fingerlings resulted in the best yield of 9-inch stockers at the lowest cost/lb. Costs to grow 3-4 inch fish to a 9-inch size were lower than costs to grow 5-6-inch fingerlings to a 9-inch size. There is a considerably greater risk of fish losses of stocking larger fingerlings to produce stockers due to the high biomass in the pond from the beginning of the season.

Contact Information –

Name: Dr. Carole Engle
Title: Professor/Chairperson
Affiliation: Department of Aquaculture and Fisheries
Address: 1 200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-mail: cengle@uaex.edu
Phone Number: 870/543-8537
Fax Number: 870/543-8129

Project 2 - Economics of alternative treatment options for effluents from catfish ponds

a. Situation – During the last decade, increasing concerns on the potential impact of effluents discharged from aquaculture operations have been continuously expressed by members of environmental organizations, which has motivated further involvement of the United States Environmental Protection Agency (EPA) in the regulation of aquaculture effluents. The EPA announced in February 2000 that a formal rulemaking process for aquaculture would be initiated. As a consequence of this action, there is a renewed interest in evaluating alternative treatment options for treating effluents from catfish ponds.

In this study, two treatment alternatives were analyzed: settling basins and production/storage ponds. In all, 121 different farm scenarios were analyzed for the treatment of draining and overflow effluents. The analysis included three different farm sizes: 160, 320, and 640 acres and two different pond sizes (10 and 15 acres). Various farm drainage layouts, hydraulic residence times, minimum particle sizes, and percentage of discharge volume treated, were considered. Scenarios included both those in which additional land could be purchased for construction of treatment facilities and those in which a farmer would be required to retrofit an existing pond, take it out of production, and use it for treatment of effluents.

b. Impact(s) – The EPA rulemaking effort continues to include options related to settling basins. Yet, EPA engineers use cost estimates based on models developed for flow-through systems. There are significant costs associated with the mechanisms for conveying effluent discharges to a treatment unit. This study developed a comprehensive set of cost estimates for catfish farmers related to the costs of constructing, installing, and operating settling basins and production/storage ponds on catfish farms. The high level of costs associated with settling basins make them infeasible as a treatment option for pond-based aquaculture farms.

c. Scope of Impact – National

Contact Information –

Name: Dr. Carole Engle
Title: Professor/Chairperson
Affiliation: Department of Aquaculture and Fisheries
Address: 1200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-mail: cengle@uaex.edu
Phone Number: 870/543-8537
Fax Number: 870/543-8129

Project 3 - Development of In-Pond Grading Technology for Commercial Aquaculture

Impact Area - Research/Extension

Issues/national goals - Competitive agricultural systems

a. Situation - Producers of channel catfish need to separate market-sized fish from smaller fish in an efficient manner that does not compromise the survival of undersized fish that are returned to the pond. The inability to successfully do this has resulted in significant losses to the catfish industry.

A new type of fish grader suitable for commercial scale use in ponds was developed. The grader uses adjustable horizontal grading bars and a novel pump to move fish onto the grading surface. Previous work focused on a grader for use in grading fingerling catfish. Work in 2001 refined the grader for use with catfish foodfish. The foodfish processing industry has recently increased the minimum market size of catfish from 0.75 lb to 1.5 lb. This has added additional importance to fish grading activities.

b. Impact(s) - The grading technology has been adopted and is in routine use by catfish foodfish producers and by two processors. Focus group meetings have been held at the request of one processing company to discuss implications for management of both foodfish production farms and processing plants of being able to grade fish quickly and accurately. Formal testing of the foodfish model will be conducted in 2001 and farm extension demonstrations have been planned for 2001.

Contact Information –

Name: David Heikes
Title: Extension Specialist
Affiliation: Department of Aquaculture and Fisheries
Address: 1200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-Mail: dheikes@uaex.edu
Phone Number: 870/543-8143
Fax Number: 870/543-8162

Project 4 - Fish disease research and diagnostics

Impact Area: Research/Extension

Issues/national goals: **Competitive agricultural systems**

a. Situation - Losses to diseases have a major economic impact on the profitability of warmwater aquaculture. The UAPB Extension Program operates 4 fish disease diagnostic laboratories located in the primary fish production regions of the state. Together, the laboratories handle more than 2500 cases per year. In addition, research projects at the laboratories discover new and emerging fish diseases, investigate the efficacy of treatments, and develop new diagnostic methods.

b. Impact(s): Typical aquaculture ponds may contain from $15,000-50,000 worth of fish and mortality from untreated disease outbreaks typically kill from 10 - 75% of the fish in the pond. Based on the means of these ranges, the number of cases handled, and a reasonable cure rate, the diagnostic laboratories save farmers more than $10,000,000/yr. Research projects including the development of new assays (PCR) for viruses, the discovery of several new pathogens, and a better understanding of the role of algal toxins in aquaculture have increased the success of the diagnostic program.

Contact Information -

Name: Andrew E. Goodwin
Title: Associate Professor
Affiliation: UAPB - Aquaculture/Fisheries
Address: 1200 N. University Dr.
Mail Slot 4912
Pine Bluff, AR 71601
E-mail: Agoodwin@uaex.edu
Phone number: 870/543-8137
Fax number: 870/543-8162

Project 5 - Row crop herbicide impacts on fish pond water quality

Impact Area: Research

Issues/national goals: Competitive agricultural systems

a. Situation –Early season rice herbicides were evaluated in the outdoor 550-*l* mesocosm system. Water quality, including phytoplankton and zooplankton evaluations, were made prior to application and at 24 and 48 h post application. Rates were direct application, high and low drift rates of 1/10 and 1/100 the direct application rate and a control with no herbicide added. Herbicides tested in order were clomazone (Command), pendamethalin (Prowl), propanil - dry, flowable (Stam) one and two consecutive applications. These, with thiobencarb, quinclorac, halosulfuron, bensulfuron methyl, triclopyr , 2,4-D amine, and molinate from 2000 testing completed rice herbicide drift evaluation.

b. Impact(s) – No impacts on any water quality parameter from drift rates were seen. However, overspray by propanil depressed phytoplankton oxygen production after 1 h and produced dangerously low morning oxygen levels after 48 h. Recovery occurred after 4 d. The second consecutive application of propanil (after 1 week as recommended for further rice weed control) did not depress oxygen production.

c. Scope of Impact – National

Contact Information –

Name: Dr. Peter Perschbacher
Title: Associate Professor
Affiliation: Department of Aquaculture and Fisheries
Address: 1200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-Mail: pperschbacher@uaex.edu
Phone Number: 870/543-8145
Fax Number: 870/543-8125

Research Program 5 – Extension Program 4 – Baitfish Production and Management

Overview

Baitfish research in 2001 focused on five main research areas: effluents, hatchery methods, pond management, fish health, and baitfish nutrition. Specific projects conducted in 2001 include the following:

a. Minimizing effluents from baitfish farms.
b. Development of baitfish hatcheries.
c. Critical cyclopoid copepod concentrations for acceptable survival of sunshine bass fry.
d. Fish disease research and diagnostics.
e. Baitfish nutrition.

Overview

Extension

Baitfish Extension programs conducted in 2001 included programs in the areas of fish health, water quality diagnostics, intensive in-door hatchery spawning and fry rearing, and assistance with the EPA rule-making process.

The baitfish industry has been a stable industry for many years. Over time, however, costs have continued to increase slowly and have slowly eroded farm profits. New hatchery technologies that have been developed at UAPB over the last decade have been transferred to the baitfish industry. These new technologies have allowed baitfish farmers to expand production levels on far fewer acres. This intensification has resulted in significant increases in farm productivity measures, decreased dependence on ground water resources, and reduced costs of production. The UAPB Extension program provided over 10,809 individual contacts with baitfish farmers and organized 3 educational meetings with baitfish farm organizations.

Project 1 - Minimizing effluents from baitfish farms

Impact Area - Research/Extension

Issues/national goals - Competitive agricultural systems

a. Situation - The USEPA is developing effluent limitation guidelines for aquaculture, bu t there is no information available on effluents from baitfish culture. Arkansas is the nation's leader in the production of baitfish, with approximately 27,000 acres of earthen ponds. Baitfish farms are primarily family operations or partnerships, and nationally, 93% of baitfish farmers are small businesses, with sales of less than $750,000.

The University of Arkansas at Pine Bluff participated in a regional project to characterize effluents from aquaculture and to develop recommended management practices to reduce effluent quantities and improve the quality. Researchers conducted on-farm studies to determine solids, biochemical oxygen demand and nutrient concentrations in effluents during pond discharge. In addition, research trials evaluated various methods to conserve water during pond preparation for fry stocking.

b. Impact(s) - Based on effluent characteristics and with knowledge of farm operations, Extension Specialists worked with the baitfish farmer's association to develop a "Best Management Practices" guide to minimize the environmental impact of baitfish farming.

Contact Information –

Name: Nathan Stone
Title: Extension Specialist
Affiliation: UAPB - Aquaculture/Fisheries
Address: 1200 N. University Dr.
Mail Slot 4912
Pine Bluff, AR 71601
E-Mail: nstone@uaex.edu
Phone Number: 870/543-8138
Fax Number: 870/543-8162

Project 2 - Development of baitfish hatcheries

Impact Area - Research/Extension

Issues/national goals - Competitive agricultural systems

a. Situation - Arkansas leads the nation in the production of fish for bait, with annual farm - gates sales in excess of $20 million. Vast numbers of small fish are required; it is estimated that Arkansas alone sells six billion baitfish annually. Using traditional pond incubation methods, farmers previously experienced relatively poor egg hatching rates, in the range of 20 - 40%. Field studies demonstrated that eggs incubated in ponds were often subjected to abrupt temperature changes and low dissolved oxygen levels in addition to known problems with fungal infestations.

Incubating baitfish eggs in tanks under controlled conditions was shown to be a feasible alternative resulting in dramatic increases in hatching success. In addition, research indicated that baitfish broodstock could be held indoors and induced to spawn early or late in the season, providing an extended spawning period.

b. Impact - Using the basic concepts developed through research, commercial baitfish producers developed large-scale hatcheries and pioneered new techniques to improve their efficiency. On one large farm alone, switching to a hatchery system was estimated to provide savings of $100,000 annually over the traditional method. In addition, the hatchery reduced risk by providing a consistent, predictable supply of fish fry.

c. Scope of Impact – National

Contact Information –

Name: Nathan Stone
Title: Extension Specialist
Affiliation: UAPB - Aquaculture/Fisheries
Address: 1200 N. University Dr.
Mail Slot 4912
Pine Bluff, AR 71601
E-Mail: nstone@uaex.edu
Phone Number: 870/543-8138
Fax Number: 870/543-8162

Project 3 - Critical cyclopoid copepod concentrations for acceptable survival of sunshine bass fry

Impact Area - Research

Issues/national goals - Competitive agricultural systems

a. Situation - Cyclopoid copepod predation on sunshine bass (female white bass *Morone chrysops* X male striped bass *M. saxatilis*) fry has been established as an important factor causing low and variable survival rates during fingerling production. A recent study showed that a concentration of 500 copepods/L could result in 0% survival of 5-day-old fry stocked at 20 fry/L during a 24-h period. Concentrations of 50 copepods/L and below resulted in survival rates not significantly different from controls with no cope pods. Farmers will encounter cyclopoid copepod concentrations between 50 and 500 copepods/L in pond water fertilized to enhance rotifer blooms or held from previous operations. Thus, this study investigated intermediate concentrations of cyclopoid copepods to determine which concentrations might result in acceptable fry survival rates.

Four to five-day-old sunshine bass fry were stocked in 2 L of water in 3.7-L glass jars at a rate of 20/L with four replicates each of varying concentrations of cyclopoid co pepods (0, 100, 200, 300, 400, and 500/L), and survival observed after 24 hours. Survival rates (75.0 - 93.1%) were not significantly different among concentrations ranging from 0 to 300 copepods/L ($P < 0.05$, Duncan's Multiple Range Test, figure 1). Survival at 400 copepods/L (62.5%) was significantly higher than at 500 copepods/L (39.4%), and significantly lower than at 0 and 100 copepods/L.

b. Impact(s) - Baitfish producers may use approved chemical treatments to remove crustacean predators prior to fry stocking in old (last year's) water. This research is valuable because it provides a threshold concentration of copepods below which no treatment is required, thus saving money and reducing chemical use. Methods that permi t farmers to re-use old water help save groundwater and reduce effluents.

c. Scope of Impact - National

Contact Information –

Name: Steven E. Lochmann
Title: Associate Professor
Affiliation: UAPB - Aquaculture/Fisheries
Address: 1200 N. University Dr.
Mail Slot 4912
Pine Bluff, AR 71601
E-Mail: slochmann@uaex.edu
Phone Number: 870/543-8537
Fax Number: 870/543-8129

Project 4 - Fish disease research and diagnostics

Impact Area - Research/Extension

Issues/national goals - Competitive agricultural systems

a. Situation - Losses to diseases have a major economic impact on the profitability of warmwater aquaculture. The UAPB Extension Program operates 4 fish disease diagnostic laboratories located in the primary fish production regions of the state. Together, the laboratories handle more than 2500 cases per year. In addition, research projects at the laboratories discover new and emerging fish diseases, investigate the efficacy of treatments, and develop new diagnostic methods.

b. Impact(s): Typical aquaculture ponds may contain from $15,000-50,000 worth of fish and mortality from untreated disease outbreaks typically kill from 10-75% of the fish in the pond. Based on the means of these ranges, the number of cases handled, and a reasonable cure rate, the diagnostic laboratories save farmers more than $10,000,000/yr. Research projects including the development of new assays (PCR) for viruses, the discovery of several new pathogens, and a better understanding of the role of algal toxins in aquaculture have increased the success of the diagnostic program.

Contact Information -

Name: Andrew E. Goodwin
Title: Associate Professor
Affiliation: UAPB - Aquaculture/Fisheries
Address: 1200 N. University Dr.
Mail Slot 4912
Pine Bluff, AR 71601
E-mail: Agoodwin@uaex.edu
Phone number: 870/543-8137
Fax number: 870/543-8162

Project 5 - Baitfish nutrition.

Impact Area - Research

Issues/national goals: Competitive agricultural systems

a. Situation – Carotenoids improve performance in many fish species. More consistent production of brightly colored feeder goldfish would benefit the goldfish industry because sales of goldfish are based on color and the consistency of color. Accumulation of dietary carotenoids in the fillet would increase the nutritional value of hybrid striped fillets.

Feeding trials were conducted in aquaria to evaluate the effects of carotenoid supplementation of diets for goldfish and hybrid striped bass.

b. Impact(s) – Goldfish in ponds were fed diets containing no carotenoids, or added astaxanthin or lycopene at 50 or 100 mg/kg. Fish color was influenced by synthetic dietary carotenoids, while growth appeared to be more dependent on the presence of a rich plankton bloom. Survival did not differ in fish fed supplemented or unsupplemented diets. Supplementation of diets with carotenoids for goldfish in ponds may be beneficial for color enhancement of goldfish under some conditions.

There were no differences in growth, survival, or feed efficiency of hybrid striped bass fed different diets. If dietary carotenoids can be accumulated in hybrid striped bass muscle, enrichment of hybrid striped bass diets with carotenoids would offer human health benefits.

c. Scope of Impact- National

Contact Information-

Name: Dr. Rebecca Lochmann
Title: Associate Professor
Affiliation: Department of Aquaculture and Fisheries
Address: 1200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-mail: rlochmann@uaex.edu
Phone Number: 870/543-8137
Fax Number: 870/543-8125

Summary of Financial Resources Expended in Aquaculture Programs related to Goal 1:

Research Programs 4 and 5	Catfish	Baitfish
Source of Funds		
CSREES	$341,175	$363,347
State Matching	$61,163	$132,922
Other	$4,280	-
Total Research Programs 4 and 5	$406,618	$496,269
Extension Programs 3 and 4		
Source of Funds		
CSREES	$212,524	$191,258
State Matching	$128,061	$114,617
Other	-	-
Total Extension Programs 3 and 4	$340,585	$305,875
Total Research & Extension Programs	$747,203	$802,144

GOAL 4 - An agriculture system which protects natural resources and the environment

Extension Program 6 – Farm Pond Management and Irrigation Reservoirs

Impact Area - Extension

Issues/national goals - Harmony between agriculture and the environment

a. Situation - Farm pond management educational activities have been conducted to focus on the key management areas of proper fertilizing, liming, and fish population management for successful recreational fishing. A pilot urban and community fishing program was developed for central and southeast Arkansas to enhance fishing opportunities, increase knowledge of fishing techniques and aquatic resource stewardship values, and to increase local community involvement in the creation and enhancement of fishing opp ortunities. Studies were completed to determine angler demographics, participation, and attitudes towards recreational fishing at community-fishing ponds in Little Rock and Pine Bluff, Arkansas.

Furthermore, an evaluation was conducted of the Hooked On Fishing – Not On Drugs Program in Arkansas.

b. Impact(s) – In all, there were 16 different farm pond programs presented in 2001. Total contacts related to farm pond management were over 1,000 in 2001. Many individuals indicated that they were planning changes in the way that they managed their ponds as a result of the new information on proper management procedures. Given the large number of farm ponds in the state, the potential impact of improving farm pond management is high.

African-Americans represented 69% of the anglers in Pine Bluff and 78% in Little Rock. The majority of anglers traveled less than 5 miles to fish. Although variable between locations, the majority of anglers preferred to catch channel catfish followed by bluegill, largemouth bass, and crappie. While satisfaction with fishing success was poor, most anglers rated their fishing -trip experience as good.

c. Scope of Impact - State, National

Contact Information –

Name: Dr. John Jackson
Title: Assistant Professor
Affiliation: Department of Aquaculture and Fisheries
Address: 1200 North University Drive
Mail Slot 4912
Pine Bluff, Arkansas 71601
E-Mail: jjackson@uaex.edu
Phone Number: 870/543-8136
Fax Number: 870/543-8125

EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

Many of the research and extension programs of the UAPB Aquaculture/Fisheries Center involve multi-state and joint activities. The effort to evaluate the feasibility of alternative treatment options for effluents from catfish and baitfish effluents has involved a number of different states and universities. The multi-state approach has afforded all participants the opportunity to compare successes and problems across states. The work to develop Best Management Practices has been a national, multi-state effort. Given the magnitude of the potential impact of EPA's actions, this national effort has enabled all project participants to take advantage of the research, experience, and insights of others across the U.S. who have had to deal with a variety of different regulatory options and positions. The collective progress of all has been enhanced by this coordinated effort.

The UAPB baitfish research program is a multi-disciplinary effort that has worked well. The successful finding that improved nutrition of baitfish broodstock allows for an extended spawning period and healthier fish was the combination of hatchery management, nutrition and fish health expertise. This successful multidisciplinary work has led to additional studies to look at the interactions among nutrition, fish health, and reproductive success for baitfish production.

The in-pond grader developed at UAPB has been tested in three different states under different conditions and with different species of fish. The results of tests in different locations under different conditions has allowed for a more complete evaluation and refinement of the grading technology.

The fish disease diagnostics program collaborates with similar diagnostics programs throughout the United States. The digital capabilities of the UAPB program allow for real-time consultations with other fish pathologists across the country.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

The majority of the research and extension activities of the Aquaculture/Fisheries Center are integrated research and extension activities. Under the planned programs related to Catfish Production and Management, the following are integrated activities:

b. Economics of producing different sizes of catfish stockers on growout farms.
c. Economics of alternative treatment options for effluents from catfish ponds.
d. Development of in-pond grading technology for commercial aquaculture.
e. Fish disease research and diagnostics.

Under the programs related to Baitfish Production and Management, the following are integrated activities:

a. Minimizing effluents from baitfish farms.
b. Development of baitfish hatcheries.
c. Fish disease research and diagnostics.

The ability of these programs to have a rapid and effective impact and to be adopted quickly by fish farmers is directly related to the fact that these were developed with an integrated research and

extension approach. An individual with a joint extension - research appointment heads each of these projects. This type of appointment makes it very easy for an activity to become both a

research endeavor and extension activity to implement those components of the research recommendations as quickly as they are completed.