

Alcorn State University Report of Accomplishments And Results

Evans- Allen Formula
Funded Research

FY 2001

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FOREWORD

Alcorn State University, the first historically black land-grant institution in America, has a long history of being “the people’s university” through service in teaching, research and extension. The unique land-grant mission has been and is continuing to be fulfilled by research scientists at Alcorn State University as they seek to reach out to the non-served and under-served populations of the State of Mississippi and beyond. A large segment of these groups consist of limited-resource farmers who seek to maintain their lifestyle and livelihood in the face of mounting challenges from global economic conditions, from large-scale factory farms and from ever-tightening environmental regulations. Others are non- farming rural residents who want and deserve a better quality of life in their communities. Keeping these situations in mind, Alcorn State University developed three objectives for its research program 20 years ago: (1) to increase the income of limited resource farmers; (2) to improve the quality of life of rural residents; and (3) to protect and improve the environment. These objectives, which mesh well with the five national goals, are as important today as they were when they were first established.

By gaining input from stakeholders in various ways, Alcorn scientists and administrators continually seek to design and conduct meaningful research related to these objectives.

It is our hope that this report enlightens you, the reader, of the scope and impact of the Evans -Allen Research program at Alcorn State University. Rural Mississippi has changed greatly in the years since the United States Department of Agriculture first decided to invest in research at Alcorn State University. We like to think that it is a better place, and, to some degree, take a share of the credit for improvement.

George T. Bates

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GOAL ONE: An agricultural system that is highly competitive in the global economy

Overview

Executive Summary

Major crops generally grown in Mississippi are produced on large scale, i.e. cotton, corn, soybeans, rice. Clientele of Alcorn State University rarely possess acreage to engage in economically viable production of such crops. Similarly, large-scale beef cattle operations which require substantial pasture acreage are seldom found among small family farmers in Southwest Mississippi. Given the reluctance of most family farmers to invest in more high-priced land, our objective has been to enable them to farm the land which they do own more efficiently and effectively. This has involved studies of alternative crops such as goats, blueberries, hot pepper, sweet potatoes, various Asian vegetables, and others. High-value crops such as these grown on small acreage under intensive cultural practices give promise of the best returns to labor and capital.

Research at Alcorn State University has produced many results which have been published and distributed. Presentations have been made at professional meetings, field days and similar events. Extension personnel distribute useful results to clientele of the University.

Some of these programs have produced significant change. For example, blueberries were long considered a minor crop grown mostly for home use in this state. Research conducted at this location has added to the growth of blueberries as an alternative commercial crop. Our research centered on vegetative propagation of blueberry plants, thus enabling a producer to grow his own plants for replacement and

expansion. Mississippi is now one of the leading blueberry producing states in the Southeast.

Another project has developed a large-pod, high pungency hot pepper. Usage of this hybrid by producers will significantly reduce labor costs associated with harvest of peppers. Value-added research has shown that piquant sauces made from this pepper are superior to that of other varieties. Use of this pepper will enable southern farmers to recapture some, if not all, of the hot pepper market from Mexican farmers who have the advantage of low labor costs.

Of the six projects, which fall within this national goal, some are at an early stage of development, while other, more mature projects have shown good benefits. It is our assessment that all projects have high potential for success.

Key Themes

1. Animal Production Efficiency

A research project entitled, “Effect of Nutrition and Suckling on the Release of Productive Hormones in Cattle” is being conducted with Holstein dairy cattle. The research seeks to monitor levels of follicle stimulating hormone and luteinizing hormone released from the pituitary glands as influenced by high or low level of nutrition and/or by nursing stimulus from the calf. Dairy (and also beef cattle) are inefficient producers when compared to other species such as hogs and sheep. A better understanding of the hormonal mechanism, which controls reproduction, can lead to more profitable operations.

Previous studies have shown that injecting prostaglandins on Day 10 of the estrous cycle in cattle results in low conception rate (52.6%). Other investigators have estimated that farmers lose over \$2.00 daily when dairy cows fail to conceive after 85 days postpartum. In this reporting period, we achieved a higher conception rate than data previously reported by other investigators. We believe that this increase was due to body condition of the heifers used in the study. It is quite possible that body condition played a major role in increasing sensitivity of luteal and hypophyseal cells to PGF₂-alpha and GnRH respectively.

This project is primarily supported with Evans- Allen formula funds- \$91,529 for this reporting period. State Matching funds in the amount of \$26,690 are used as a portion of the principal investigator's salary.

The expected scope of impact of this research will be multi-state and multi-national: wherever cattle are grown.

2. Diversified/ Alternative Agriculture

This project, "Alternative Vegetable Production", represents one of the earliest and still ongoing areas of interest for researchers at Alcorn State University. Over the years, several crops such as muscadines, peanuts, sweet potatoes, strawberries, okra, and hot pepper have been studied. A number of research publications have resulted from this work and these crops are now firmly established in the agricultural community of the state. Research thrusts have included breeding, soil fertility, management practices, harvesting, post-harvest handling and value added processing. Research has been instrumental in developing a cooperative of farmers to produce sweet potatoes. These producers planted 2000 acres during this reporting period and have plans to expand in the near future.

Accomplishments:

- a. Study on the amaranth plant density has been presented at professional meetings and published in the Journal of Vegetable Crop Production, Vol. 6(2) of the 2000 edition.
- b. Study on the Echinacea cultivar's trials has been presented at professional meetings and are being reviewed for publication in the Journal of Herbs, Spices and Medicinal Plants.
- c. Thesis has been developed for each study.

Funding for this project during the current period from Evans-Allen comes to \$ 46,506. State support of this work includes part of the salary of the principal investigator and comes to \$ 58,752.

Scope of Impact of this research is state specific.

3. Plant Production Efficiency

"Low Input Sustainable Production of Fruits and Nuts" is the title of the research being conducted which fits into this key theme. This project seeks to identify cultivars of fruits and nuts, which are genetically superior in this environment, and to develop cultural practices, which enhance yields. Such practices include studies comparing; (a) organic versus inorganic fertilizers; (b) different sources of mulch; (c) drip irrigation versus conventional irrigation; and (d) others. A number of publications focusing on various aspects of the research have been widely received by fruit producers of the state, many of whom are family farmers. Attendance at field days has always been good and producers have expressed high interest in seeing research in progress. Research results at this

location have influenced decisions of producers to include sustainable practices in their orchards and groves.

During the reporting period, five different cultivars, each of peaches, nectarines and plums were planted. All trees are living and growing well. Information is being collected on growth parameters. Yield and fruit quality information will be collected when the trees reach production stages. At present, these newly planted trees are at flowering and fruiting stages.

\$ 87,814 of Evans- Allen funds is used to support this work. State funds in the amount of \$ 43,168 are used to supplement staff salaries.

Scope of this project is state specific as environmental conditions might differ in other areas.

4. Risk Management

A research project entitled, “ Farm Management and Risk Reducing Strategies” is being conducted in this key theme area. This project is identifying farm management and risk management practices currently being used by small farmers in the state. Researchers will then develop strategies to minimize production, marketing, price, and financial risks which they may face. As this reporting period represents only the first year of this five-year project, no impacts are yet available to discuss.

A questionnaire for the field survey has been completed and will be administered to a selected sample of small farmers. Extension agents in the 14 southwest Mississippi countries, including selected counties in Mississippi Delta area, have been contacted for names and addresses of survey participants. A meeting has been arranged to explain the purpose and nature of the survey to the extension agents.

A substantial amount of farm risk management literature has been assembled and reviewed for use in the project. The information will be shared and made available to interested parties.

Evans- Allen funds allocated to this project total \$ 63,085. Supplemental state funds used to support staff salaries come to \$51, 467.

The scope of impact of this research is anticipated to be multi-state since all farmers face similar problems.

5. Small Farm Viability

This Project, “Analysis of the Economic Performance of Small Farm Marketing Strategies” is designed to enhance marketing skills of producers. Often, marketing of a commodity is the weak link in the profitability chain. The researchers seek to uncover marketing information by surveying farmers as to their opinions and experiences relative

to U-pick operations, farmer's markets, roadside stands and wholesale marketing. This project, which is in its fourth year, seeks to bridge the gap between what is and what ought to be. Data, which has been collected is being analyzed and should result in conclusive evidence, which can be used in policy-making decisions.

Accomplishments:

- a. Farmers Markets: A list was compiled of all current and operating farmers' markets (FM) in the state of Mississippi. Each of these markets was then contacted to obtain a current and updated list of farmers operating in the market. An address database was created. The FM survey instrument was modified to include all pertinent information. The current list includes 103 farmers dealing with the Biloxi and Meridian farmers. Farmers operating out of the Natchez farmers' market will be added to the list. The survey data will be collected by mail with close communication with the FM managers and agricultural agents in the counties.
- b. Pick-your-own and Farm Stands: Data Collection efforts in this area involves a telephone survey. Telephone calls are being made to pick-your-own farmers who did not respond to the mail survey last year. Even though 38 pick-your-own farmers have been contacted thus far, they are not responding to the survey questions. Therefore, alternative strategies will be used in the future to collect these data in order to accomplish the stated objective.
- c. Wholesale: Thus far, more than 130 produce wholesalers have been identified throughout the state of Mississippi. A wholesale survey instrument is being developed to assess the procurement practices of these buyers regarding specific small farm products with new attributes and specialty enterprises. The study will look at timing, volume, quality requirements, barriers to entry, willingness-to-buy, current sources of procurement, potential impact on small farm income and likelihood of success for the local producer targeting these resources.
- d. Grocery Stores/ Supermarkets: The current database includes more than 700 stores. Emphasis will be placed on organic, low-chemically produced, procurement of specialty products (e.g., shiitake mushroom, etc...), pricing and volume.

Funds from the Evans-Allen program for support of this project total \$ 107,242 for this period. State support is \$ 78,774 and is used to supplement salaries of staff.

The scope of impact of this research is anticipated to be multi-state since all small farmers face similar problems as to the marketing of their crops.

6. Adding value to new and old agricultural products:

The project, " Model Forest Products Processing to Enhance the Economic Development of Jefferson Country, Mississippi" is envisioned to produce new and novel products from

wood. Forestry is a major source of income for many small farm landowners in Southwest Mississippi. Additionally, the rate of unemployment in the area is high. New uses for wood and commercially viable manufacturing processes would benefit all residents of the area. Accomplishments to date include setting up an experimental laboratory and hiring a staff member with a terminal degree in forest products.

Evans-Allen Funds for this project totaled \$ 119,112 for the reporting period. State funds used to supplement salaries of staff equaled \$ 85,776.

Scope of impact of this research is (3) multi-state research, to include all states within the southeastern region of the United States.

GOAL TWO: A safe and Secure Food and Fiber System

Overview

Executive Summary

Food safety is an issue which is at the forefront of public concern. Although our nation now enjoys the safest and most wholesome food in the world, we must remain vigilant to see that it continues to be safe and wholesome. Added to the old list of food concerns such as E. coli, Salmonella, and others, are newcomers such as bovine spongiform encephalopathy. New and emerging diseases and problems will continue to evolve. Bio-terrorism is also a new factor which now poses a threat to food supplies. A number of these situations can be addressed at the farm through preventive and remedial measures. Research can open new doors to provide the consuming public with a continued supply of nutritious, healthy, and wholesome food.

Having a safe and wholesome diet is a major quality of life issue: therefore, scientists at Alcorn State University find it within the objectives of the research program

and within the goals of the United State Department of Agriculture to conduct research in this area.

Key Theme

1. Food Quality

The research project in this key theme area is entitled “ Litter Type, Influence on Broilers.” Whereas pine shavings or sawdust has characteristically been the material of choice for litter on the floors of broiler houses, it has not been without its drawbacks. Due to the pH of the pine shavings, sore feet and breast blisters often erupt on the young birds. This leads to poor growth rates and feed efficiency and, ultimately, to scarred, infected carcasses, which inspectors must condemn. Our research focuses on alternatives to pine products such as shredded newsprint, hardwood material and other cellulosic products. While data is still being collected, preliminary results show a lessened incidence of sore feet and breast blisters among the birds.

2400 broiler chicks were used in two trials to assess the effect of litter type on broiler performance. Pine softwood shavings, industrial waste, newspaper and sawdust were the experimental treatments. A 4 x 3 randomized complete block was used. Feed and water were fed ad libitum. A continuous light regime was maintained. Body weight gain, feed efficiency, foot problems (blisters) and breast irritations (blisters) were the criteria measured. Body weight and feed consumption data were collected at 21, 35 and 42 days of age. Each trial was terminated at 42 days of age. Carcasses were visually inspected by treatment. No significant differences existed.

Federal funds allocated to this project total \$50,167. State support used to augment staff salaries is \$ 46,040.

The scope of research is multi-state in that all broiler producers in the southeastern United States face the same problem.

GOAL THREE: A Healthy, Well-nourished Population

Overview

Executive Summary

Good health is a basic human need, which, in part, defines quality of life. Basic human needs (food, clothing, shelter) have been a topic of research at Alcorn State University for many years. Volumes of research at this and other locations have shown that good health and good nutrition are undeniably intertwined. The adverse effects of high fat, high cholesterol diets on cardiac well-being are now widely accepted. It is known that certain food items have a correcting effect on this condition, for example omega-3 fatty acids and soy proteins. People in the south have historically consumed high levels of fat in the diet. Southerners in general and minority populations specifically are at greater risk statistically for threatening health problems such as hypertension and high blood cholesterol and tri-glycerides. These problems could be alleviated to some extent by minor and pleasant changes in the diet.

Key Theme

1. Human Nutrition

A project entitled “ Development of Low-fat, Low-cholesterol Soy Bean Recipes” is in its third year at Alcorn State University. 22 recipes have been developed and tested on students, faculty and staff at the university. There has already been wide demand for some of these recipes; however, they will not be released until all testing is completed.

Completed development of soybean recipes and sensory evaluation of the 22 recipes that received acceptable comments from faculty, staff and students of the university. We are now in the process of conducting taste-test sessions in the community. Due to financial constraints, we could not analyze the nutritive values of the recipes, as stated in the objective, but hope to do so in the future.

To date, consumers evaluated eight recipes. The first three recipes, a soy shake, a soy muffin and a tofu dip were evaluated by 90 participants during the October 2000 Field Day. All the recipes received acceptable scores of 7 or above. Results were analyzed with Soy Muffins, Tofu Dip and Soy Shake, which received an average score of 8.23, 7.59 and 7.14 respectively. Another taste test session was conducted at the Claiborne County Health Center, March 1 at 7.00 p.m.. We anticipated a turn- out 60 applicants. However, due to the thunderstorm and tornado warnings, only ten participants were present. Five

soy recipes were prepared for the anticipated 60 participants. Because of the low attendance, the results will not be reliable. The recipes will be repeated with another group in the community at a later date. Another sensory evaluation session with five more soy recipes: Tofu Salmon Hor D'oovers, Refreshing Oriental Soy Salad, Soy Escape Sandwich, Spicy Soy Vegetable Soup and Cinnamon Tofu Crispies was conducted at the ASU School of Nursing, Natchez, MS on April 18, 2001 at 11.00 a.m. Additionally, a graduate student, Koretta Kitchens, is working on data from the consumption survey and will be completing her thesis during the second summer term this year. Plans will be made to conduct taste-test with three more soy recipes to participants during the next Field Day.

The Evans-Allen Program at the level of \$ 84,309 funds this project. State Funds, which support staff salaries, are \$ 60,660.

Scope of impact for this project should be multi-state and multinational. Wherever people experience cardiac-related health problems, they will benefit from the recipes being developed in this research.

GOAL FOUR: Greater Harmony Between Agriculture and Environment – NONE

GOAL FIVE : Enhanced Economic Opportunity and Quality of life for Americans.

Overview

Executive Summary

As the economy of the United States has accelerated to new heights during the last decade, many Americans in rural areas have been left behind. Pockets still exist in Mississippi and in other states where unemployment is in double-digit figures. These situations can be explained by poor educational levels of the general public, poor transportation infrastructure, or other factors; however, little research has been conducted in Southwest Mississippi to learn the truth of the matter. Data is being compiled to verify causes of the current conditions so that we can take steps to move to a higher level. Corrective measures might not be too difficult if it is known specifically what factors need to be corrected. Quality of life for small town and rural residents of the area can be enhanced by greater economic opportunity. Such opportunity can come from agriculture, government installations, manufacturing, service industries, small business, or other sources. Our research is a small part of an overall effort being conducted by numerous local, state, and federal agencies to enhance economic opportunity for residents of this area. Such effort is laudable and greatly needed, for these counties have been an economic backwater for many years. As the overall unemployment rate for the state dips below five percent, the rate for most Southwest Countries is still in double figures.

Key Theme

1. A project entitled, “Local Labor Markets in a Global Economy” was extended for one year. This research seeks to identify sources of labor and sources of employment and match the two. A key facet is to study potential types of employment, which might succeed in the area based on resources already at hand – timber, water, agricultural commodities, as well as the available labor supply. A publication of results has been prepared and was distributed to local development districts, the state economic development authority and others who might benefit from it:

Tally, C. and Cotton, B., 1993. “*Inequalities in Local Labor Markets.*” Black Concentration Black-White Earnings Inequality in Labor Market Areas. In J. Singelmann and F. Deseran (Eds.), Westview Press: Boulder, CO

Evans- Allen funds allocated to this project for the FY 2000 were \$ 78,236. State funds, which support staff salaries, were \$ 35,407.

Impact of this study will be state specific in that the target area was the southwestern part of the state. Conditions in this area might not be duplicated in another areas.

STAKEHOLDER INPUT PROCESS:

In order to research have value, someone must benefits from its findings. This requires that those parties (stakeholders) be identified and contacted and that their needs and opinions are factored into the development of the research programs in general and research projects in particular. Alcorn State University research scientists are keenly aware of the needs of our clientele and consult with them on a regular basis and in many ways. Some of these are listed.

- A. Consultation with extension personnel who meet with producers and rural residents on a regular basis. Extension personnel hold “town meetings” to get stakeholder input and consequently give feedback to research counterparts.
- B. Stakeholders are brought to research sites for direct interaction with scientists. This may be an event such as a field day or a less formal occasion.
- C. Input from public officials. Many elected and appointed public officials serve as intermediaries between their constituents and the university. On a number of

occasions, they have called attention to existing problems, which were then addressed by research scientists.

- D. Input from employees of other USDA agencies. A somewhat collegial relationship exists between university scientists and employees of many USDA agencies who are also scientists or who possess a science background. Interchanges between these persons give helpful insights into research opportunities and have led to establishment of joint efforts in a number of cases, although few of these have received formula funding.

Information gleaned from the above resources is taken into serious consideration before any research proposal is submitted. The research scientist will sit with the Research Director and Associate Research Director to discuss the importance of the project with relation to the clientele. The proposal must then undergo an on-campus peer review before it is submitted to the administration for consideration. At that point, the Vice President for Institutional Advancement, Planning and Research will certify it as to content. Next, the Executive Vice President will certify it to the fiscal accuracy. Then, the President as chief executive officer of the university signs it.

All of this procedure originates with the stakeholder input, which is very useful in setting the focus of the program, developing priorities, and identifying emerging issues.

PROGRAM REVIEW PROCESS:

There have been no significant changes in the program review process since the Five-Year Plan was submitted.

EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES:

Multi and joint activities have allowed scientists at Alcorn State University to participate with colleagues on a national scale. Such activities have given them access to facilities,

data banks, etc., that would have not been available otherwise. The scope of their research has been immeasurably broadened by these contacts. The ultimate benefactor of these activities is, of course, the stakeholder. The reader is referred to Sections 3 and 4 of the Five-Year Plan of Work for a partial listing of these multi and joint activities. These activities have been of great benefit to the Alcorn State University Research Program. New collaborations developed since submission of the Five-Year Plan of the work include:

- A. Funding of an IFAFS project in collaboration with several other 1890 institutions in the subject area of agricultural biotechnology transfer;
- B. Collaboration with ARS/USDA and Texas A&M University in the area of Biotechnology and development of a Biotechnology Center at the University.
- C. Collaboration with the University of Nebraska-Lincoln and ARS/USDA on biotechnology issues.

Several questions should be continually addressed to further assess the effectiveness of multi and joint activities.

Those are;

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

For the most part, the answer is “yes”. Further explanation reveals that as collaborations evolved, new and unexpected issues would sometimes arise.

2. Did the planned programs address the needs of under-served and under-represented population of the state(s)?

The answer to this question is an emphatic “yes”. The target population of small family farmers and rural residents in Southwest Mississippi is strongly a minority population who have been under-served and under-represented for many years. Our work has enabled a significant segment of this group to advance to a higher rung on the economic ladder and to enjoy a better quality of life.

3. Did the planned programs result in improved program effectiveness and/or efficiency?

The programs did a fairly good job at describing the outcomes. Impacts are harder to predict. Overall, the programs were fairly successful in this area. In the future, more thought and effort should be devoted to this phase of study.

4. Did the planned programs describe the expected outcomes and impact?

Very much. Scientists are now more aware of the need to consider stakeholder input and to distribute results to the stakeholder through various outlets (publications, field days, exchanges with extension personnel etc.). A larger target audience is being reached now than ever before. Also, mandated salary increase over the past several years have made budget shifts inevitable and less money is now available for purchase of equipment and supplies. While state funds have compensated for this shift to some extent, the scientists have learned to continue to produce with less operating capital. Thus, it becomes absolutely necessary to give much thought to setting goals and priorities. A large-scale survey is planned among clientele to delineate the effectiveness of research/technology transfer. Results of this survey may dictate future changes.