

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Agronomic Crops

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	15%	0%		
111	Conservation and Efficient Use of Water	10%	0%		
205	Plant Management Systems	20%	0%		
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	0%		
212	Pathogens and Nematodes Affecting Plants	10%	0%		
213	Weeds Affecting Plants	10%	0%		
215	Biological Control of Pests Affecting Plants	5%	0%		
216	Integrated Pest Management Systems	20%	0%		
	Total	100%	0%		

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	24.5	0.0	0.0	0.0
Actual Paid Professional	18.5	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
623327	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
645675	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1913907	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Geospatial Education and Precision Agriculture Programs: Public and private interest in utilizing geospatial technologies is increasing as the technology less expensive and more user friendly. "Geospatial Technologies Program" was initially a "train the trainer" effort where ACES staff were trained in global positioning system (GPS) hardware, geographic information systems (GIS), and remote sensing. The ETP provided internal in-service training session and training workshops. The workshops were tailored according to the specific needs of the clientele group that was being served. The groups included ACES, extension personnel from other states, forestry and wildlife users, agronomic crop producers and private representatives, and athletic uses.

2. Herbicide Resistance Management Program: The proper use of herbicides, sprayer calibration, and crop rotation benefits help limit the spread of herbicide resistant weeds. Farmers were able to report weeds in their fields that were resistant to foliar herbicides such as glyphosate. Herbicide resistant weeds have the potential to dramatically increase weed control costs. Success of the project will be determined by how well we are able to limit the spread of herbicide resistant weeds in Alabama. Pigweed is a major concern to Alabama farmers since a resistant species currently infests several fields in Georgia. The ultimate goal of this ETP is to rapidly detect and limit the spread of herbicide resistant weeds by educating the farmers in methods designed to slow and/or prevent the occurrence and spread of herbicide resistant weeds. Herbicide resistance could cost Alabama cotton farmers alone over \$8,000,000 per year.

3. Asian Soybean Rust Project: Asian soybean rust was originally discovered in Brazil a number of years ago. Over the past 10 years, it has been documented in the United States and it has been found that soybeans are susceptible to this fungal pathogen. This project consists of a statewide season-long monitoring program that provides an early warning system for soybean growers in Alabama and the Southeast. In fact, this information is fed into a national database as an "early warning" system for the millions of acres of soybeans produced in the mid-western U.S. The project consists of REAs, CECs, and specialists establishing and monitoring soybean sentinel plots located throughout the state. When soybean rust is detected in a sentinel plot, growers were alerted via the AU Soybean Rust Hotline and the USDA-Soybean Rust Website.

2. Brief description of the target audience

2011 Agronomic Crops Program Priority Team activities included the following groups of stakeholders: 1) row crop producers and their representative groups that include, but are not limited to, the Alabama Cotton Commission, Alabama Peanut Commission, Alabama Soybean Producers, and the Alabama Wheat and Feed Grains Committee; 2) row crop advisors including ACES agents and specialists, public and private

crop advisors; 3) governmental agency personnel including USDA, NRCS, and federal crop insurance and risk managers, 4) public policy makers requesting information that impacts Alabama's agricultural community, and 5) private citizens impacted by policies and practices used for the production of food, fuel, and fiber. All educational programming efforts will target audiences without exclusion or discrimination, as specifically defined by ACES policy guidelines.

3. How was eXtension used?

There are two eXtension COPs that are related directly to interaction with ACES: cotton and GIS. Members of our team are also directly involved with the Fire Ant COP that was one of the first communities of practice that was developed, approved, and funded by the national effort. Extension Specialists are involved at some level in the development of web-based material within their own institutions. Moreover, all are involved in the generation of newsletters, numbered extension publications, advisories, circulars, etc. While some of the information contained in these web sites and newsletters is specific to the state in which it was developed, much of the information is applicable across the respective clientele geographic areas. A major part of the curriculum to be developed by the CoP is the compilation, and review of this information for publication and dissemination to a national audience. A review process was developed and continues to be maintained to identify information and content that has relevance to a national audience and that this content be presented, maintained, and updated by the CoP, primarily in a web-based format. This information would be of great interest to the Col and through our marketing has become a primary source of information for end-users in the US.

Research reports and articles reporting the results of applied research in GIS, fire ant biology and management, and cotton production have been generated within each state by qualified scientists. Because of the nature of the research and problems inherent in generating peer-reviewed journal articles in a format easily used by the industry, much of this research is rarely published in peer-reviewed journals. An information void has historically existed, therefore, for relevant applied research findings in these areas to be published in an understandable and usable format for clientele across state lines. The CoP continues to accomplish this through a peer-review system, similar to many journals, but with the end product being in a format (written article or multimedia) that is published and made available through eXtension. The Extension Specialists serve as authors and also as an editorial board to facilitate the publication of applied research information that is of interest across state lines to the Col.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	374000	721000	25674	221432

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

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	8	8	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Several outputs will be generated by this project including distribution of state and region-wide information on the occurrence of Asian soybean rust, insect pest management, field crop diseases, and potential herbicide resistance in crops around the state. Alternative control measures will be developed to reduce the impact of the problem pests on the current crop. Recommendations for a management plan for agronomic row crops will be developed. Several methods of notification (e-mail, Timely Information Sheets, articles in the popular press, etc.) will be used to disseminate information. Meetings, conferences, and trainings throughout the year will include resistant weed management, geospatial and precision agriculture information, soil fertility and fertilizer management, and in-season tours and field days will be used to provide local information on the problem. Other methods such as printed articles and web-site information will be distributed through e-mail and website publications to inform the farming community. Specific outputs will include: 1- In-service training meetings for target audiences and on-farm visits for cotton, soybean, Asian soybean rust, peanuts, field corn, and small grains production; precision agriculture techniques including geospatial technologies, herbicide resistance as well as integrated management of insect pests; 2- Response via phone, e-mail, internet, and on-farm visits at the request of the producer to diagnose and deliver agronomic crop production recommendations; 3- Information posted on the agronomic crops and the national Asian soybean rust website (i.e., www.alabamacrops.com) and through the Auburn University Soybean Rust telephone hotline; 4- Publications like the 2011 IPM Guides and demonstration results reports for use by clientele groups; 5- Hard copy publications for use in production meetings and trainings where deemed appropriate; 6- Establishment of disaster responses when a natural environmental disaster occurs.

Year	Actual
2011	2011

Output #2

Output Measure

- The team was prolific in 2011 outputs with 23 abstracts, 202 county presentations, 52 other presentations, 102 extension publications, 22 peer reviewed extension publications, 15 research

peer reviewed publications, 1 newly established blog, and 75 on-line publications.

Year	Actual
2011	2011

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Members of the ACES Agronomic Crops team is required to provide a success story on an annual basis describing the program activity which they felt best demonstrated the impacts of their work. These success stories contain the following elements: 1) why the program was conducted or the situation/problem that was addressed; 2) specifically what and how it was done; 3) the time period involved; 4) the specific locations involved; 5) who was impacted; 6) how many people were served; and 7) the final impacts.
2	Short-term outcomes: The most immediate outcomes are: 1) to document the direct positive financial impact that our agents and specialists have on our clientele and their farming operations. For example, advice that leads a producer to consider a higher-yielding crop variety, use of available animal manures for fertilizer, or increased efficiency from prescription site-specific management of agricultural chemicals, seeding or fertilizers can result in increased income totaling millions of dollars across the state; and 2) to provide research information and recommendations that allow producers to control pests only when needed and save them money on unnecessary treatments or save their crop from destruction. In addition, directing producers to sustainable IPM for weeds, insects, and diseases can have a major positive impact on lessening the costs associated with herbicide resistant weeds, insecticide resistant insect pests, and devastating crop diseases such as Asian soybean rust.
3	Long-term outcomes: The long-term outcomes of the Agronomic Crops Extension program are: 1) to ensure the long-term economic viability of Alabama row crop producers; 2) to ensure that there is a stable, domestic source of food and fiber for the citizens of Alabama and their future generations; 3) to ensure that there will continue to be row crop farms operating in the state for many generations to come; 4) to ensure that the recommendations and resulting decisions that are made by the row crop industry in the state is environmentally and economically sustainable; 5) to ensure that the activities and outputs generated by the practices investigated and recommended by this team will benefit and serve to conserve natural resources for all agricultural and general citizen audiences

Outcome #1

1. Outcome Measures

Members of the ACES Agronomic Crops team is required to provide a success story on an annual basis describing the program activity which they felt best demonstrated the impacts of their work. These success stories contain the following elements: 1) why the program was conducted or the situation/problem that was addressed; 2) specifically what and how it was done; 3) the time period involved; 4) the specific locations involved; 5) who was impacted; 6) how many people were served; and 7) the final impacts.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2011

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The primary audience for the ACES Agronomic Crops Team's success stories include producers, industry representatives, crop managers including extension professionals, and policy makers. The stories provide a foundation for understanding how much work is conducted for the clientele, often without appropriate recognition.

What has been done

Wiregrass Cotton Expo for Southeast Alabama; Glyphosate-Resistant Pigweed Monitoring and Control in Alabama; Long-term Behavioral Changes in Certified Crop Advisors Receiving Entomology IPM Training; Extension Row Crop Variety Tests Provide Useful Information

Results

Wiregrass Expo: The total economic impact was over 30 million dollars through agronomic and marketing education.

Herbicide resistance: Through the education program and information disseminated concerning the threat of herbicide resistance in weed and higher row crop prices in 2011, farmers saved over \$4.5 million.

IPM Program: Increasing interest in IPM; increased use of IPM publications; increasing adoption of IPM practices; removing barriers to IPM adoption.

On-farm soybean, small grain, field corn, and cotton trials help producers select appropriate varieties which increases income several million dollars for the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Short-term outcomes: The most immediate outcomes are: 1) to document the direct positive financial impact that our agents and specialists have on our clientele and their farming operations. For example, advice that leads a producer to consider a higher-yielding crop variety, use of available animal manures for fertilizer, or increased efficiency from prescription site-specific management of agricultural chemicals, seeding or fertilizers can result in increased income totaling millions of dollars across the state; and 2) to provide research information and recommendations that allow producers to control pests only when needed and save them money on unnecessary treatments or save their crop from destruction. In addition, directing producers to sustainable IPM for weeds, insects, and diseases can have a major positive impact on lessening the costs associated with herbicide resistant weeds, insecticide resistant insect pests, and devastating crop diseases such as Asian soybean rust.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2011

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cotton producers in the northern area of Alabama that were affected by the regulations that had been proposed would have lost a primary soil-applied herbicide tool for controlling herbicide resistant marestail and Palmer amaranth. This would have increased costs and resulted in further spread of these resistant biotypes.

What has been done

Members of the team under the direction of the north Alabama agronomist worked with various governmental and cotton groups in developing guidelines for re-registration of fluometuron use in five north Alabama counties. Numerous visits to sample well sites were conducted in conjunction with the regulatory agencies involved. Numbers meetings with agronomists and AU environmental scientists were also conducted to determine why regulatory actions were initiated.

Results

Through the efforts of the north Alabama agronomist and associated team members, revisions to current labeling were enacted. This saved producers a minimum of \$15.00 per acre of additional herbicide cost since fluometuron is considered a "generic" herbicide with low cost. With over 200,000 acres of cotton in the counties affected, the overall short-term effect was \$3 million in that area of the state alone.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
205	Plant Management Systems
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Long-term outcomes: The long-term outcomes of the Agronomic Crops Extension program are: 1) to ensure the long-term economic viability of Alabama row crop producers; 2) to ensure that there is a stable, domestic source of food and fiber for the citizens of Alabama and their future generations; 3) to ensure that there will continue to be row crop farms operating in the state for many generations to come; 4) to ensure that the recommendations and resulting decisions that are made by the row crop industry in the state is environmentally and economically sustainable; 5) to ensure that the activities and outputs generated by the practices investigated and recommended by this

team will benefit and serve to conserve natural resources for all agricultural and general citizen audiences

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2011

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Multiple teams including the Agronomic Crops Team are working closely with industry personnel to develop optimal IPM practices that will allow judicious use of insecticides and reduce the cost of crop production.

What has been done

IPM meetings in peanuts and other row crops have been success in attendance and in response. Funding from production group check-off funding has allowed the team to provide information during meetings and to answer calls based on IPM trainings they have received through programs lead by three entomology specialists. Newsletters, articles written, and programs specifically designed for the clientele have been put into place.

Results

Long-term use of IPM strategies is now on the rise as indicated by surveys and by personal observation of our team members when making on-farm calls. The high cost of inputs, concern for protecting the environment, sustaining food and fiber sources in Alabama and the entire U.S. have all been part of the impetus behind ensuring that IPM strategies are implemented and on the first order of importance when managing pests in field crops.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

External factors that affected the Planned Program Outcomes included the following: natural disasters, economy, appropriations changes, public policy changes, government regulations, competing public priorities, competing programmatic challenges, and population and demographic changes across the state. The nature of agricultural sciences and biological systems ensure that external factors are common occurrences as are the policy and political changes that can change the landscape quickly and permanently with respect to short- and long-term planning windows. It is the unforeseen, unpredictable factors that cause so many problems for our planning process. While the planning process certainly helped us in 2011 to have organization and purpose to our efforts, rigid processes that are not allowed flexibility hampered our field efforts to some extent. Flexibility that comes with understanding the external factors was considered as a positive by our team. Many of the situations encountered in 2011 could not be foreseen like drought and early-season hot weather; however, it should be noted that the agronomic crops team has historically responded in a timely and appropriate fashion when dealing with these situations. In 2011, as in other years, dealing with unforeseen events meant that additional stakeholder meetings had to be planned while other meeting and trainings with clientele had to be postponed. Programmatic plans must take into consideration that flexibility is an absolute necessity if we are to be successful in future years as we were in 2011. Policy, funding, and staffing changes were positive and negative during the 2011 programmatic year. Reduction in overall funding due to national and economic downturns has made hiring staff into vacant positions a challenge. This was not different in 2011 where a number of new hires came in the ACES program. However, newly hired staff outside of administrative positions was offered a one to two year contract. The net result in 2011 was that positions that had historically been career positions served as a training ground for young agents and specialists to move on after their contract to private industry. Salary differences between private industry and ACES made it difficult to hire and maintain young staffing.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Aerial web blight (a foliar disease of soybeans) was detected in a 100-acre field in Sumter County in July. The grower was contacted and advised to apply a fungicide as soon as possible to avoid significant yield loss from the disease. Based on weather conditions I estimated a 10% yield loss would have occurred without this action by the grower who followed through on my recommendation. Results: Field produced 38 bushels/acre x \$11.60/bushel x 100 acres = \$44,080; Cost of fungicide application was \$20/acre x 100 acres = \$ 2,000; Crop value with fungicide application \$2,080. We estimated a 10% yield loss would have occurred without the fungicide application resulting in a yield loss of 3.8 bushels/acre at \$11.60/bu x 100 acres = \$4,408 estimated loss. Our rapid response increased grower profit by \$2,408 in this situation.

A grower in Pickens County asked if they should apply a fungicide to a 250 acre soybean field for general disease control in September. Based on the weather conditions and the advanced growth stage of the crop, we deemed the crop not at risk to yield loss from foliar diseases and recommended that they not apply a fungicide (at a cost of \$20/acre). The grower did not spray the 250 acre field with fungicide and a return visit to the field showed that there was no yield loss due to foliar diseases. Our rapid response increased grower profit by approximately \$5,000 by avoiding an unnecessary fungicide application and reduced the potential for environmental impact to 0.

Our team has conducted seeding rate studies at the WREC in SE AL. We have used the seeding rate of 1.7 - 1.8 seed per foot as the low seeding population. The reason being is that many growers are using 2 seed per foot to 2 seed per 13 or 14 inches of row in an effort to reduce the cost of production. We studied 5 different seeding rates and the rates ranged from the low seeding rate to 4.5 seed per foot. In 2010, we also tested this with 3 different varieties, replicated four times. The data was variable in yield except one trend was consistent for all three varieties and seeding rates. From the low seeding rate of 1.7 - 1.8 to the second seeding rate of 2.4 seed per foot, we saw around 160 pounds per acre more lint cotton being produced on average. After several group production meetings and farm visits this spring, producers have decided to not lower their seeding rates this year or they have decided to increase their seeding rate because of the yield that was not being captured to a seeding rate that was too low. With cotton at \$1.32 per pound, this information can lead to significant income increases in 2011. If the usual acreage of 175,000 acres is planted in the Wiregrass this year, the impact from this information from Extension could lead to nearly 37 million dollars in revenue from the addition seeding investment of 4.2 million dollars, just from the wiregrass area alone.

Key Items of Evaluation

Through plenary evaluation training events conducted by Dr. Ayanavah Majumdar, entomologist and specialist with the Alabama Cooperative Extension System located in SW AL, our team members were much more familiar with evaluatory procedural techniques that in past years. For example, the GIS SPI, lead by Chris Dillard, GIS specialist and leader of the ACES GIS Program, the following was developed and conducted: 12 workshops in Tuscaloosa, Sumter, Conecuh, Mobile, Autauga, Cullman, Dallas, Clarke, Blount, Henry, Mobile, and Lee Counties; support manuals for participants, and tutorial videos developed through the use of Google Earth. Evaluation of the first eight events indicated that there were 142 attendees, workshop quality was at 90%, and that there was a 23% increase in the overall knowledge level of the participants. The challenges that were encountered included attendees who were not comfortable with the technology (initially), older laptop computers,

attendees with many varied skill levels, and the lack of additional hardware for larger trainings. Overall interest has increased such that a second tier educational process is under development and will be offered in 2012 as "GPS 201".