V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Commercial Horticulture

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	25%	25%		
111	Conservation and Efficient Use of Water	5%	5%		
205	Plant Management Systems	50%	50%		
215	Biological Control of Pests Affecting Plants	10%	10%		
216	Integrated Pest Management Systems	10%	10%		
	Total	100%	100%		

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	0.0	0.0
Actual Paid Professional	9.0	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**
152698	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
315335	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
950018	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

ACES Commercial Horticulture Program Area consists of 7 Regional Extension Agents (REAs) and several Extension Specialists working together on Team Projects across the 67 counties of Alabama. Feedback collected from needs assessment surveys, County Advisory Boards, commodity groups, and Extension Plan of Work meetings were used to prioritize, develop, implement, and improve commercial horticulture programs statewide for providing solid support to farmers and gardeners. Overall activities are listed below along with links to Success Stories at the end.

- Planned programs (need based): 39 fruit production meetings and 33 vegetable production meetings for producers. Also completed 49 horticulture crop production demonstration plots in 2011.
- Reactive programs (issue based): Completed 110 meetings on a number of issues that included special on-demand programs. The Commercial Horticulture Team also organized the Alabama Fruit & Vegetable Conference that was attended by 210 participants in 2011 - an increase of 110% compared to 2010. This conference has multi-track agenda that caters to the training needs of large and small producers, new and experienced growers, gardeners and homeowners.
- Hours of programming & contacts: Approximately 697 hours of training to 8,882 audiences across Alabama (see later section for details about participants). About 60% of the audiences (~ 5,300) are also on email lists for receiving newsletters from REAs. REAs & some Specialists answered over 12,535 phone calls and 16,720 emails. Provided 400 on-site consultations to producers (rural + urban) and gardeners.
- Program relevance & impacts: High direct contact numbers from this Team indicate that we are doing relevant programing resulting in effective technology transfer with improved technology adoption rates. For example, the integrated pest management (IPM) adoption rate is estimated to be at 62% among crop producers. The IPM program has also removed barriers to technology adoption (more on this under evaluation). Total Commercial Horticulture Team program impact exceeds $8-10 million.
- External linkages: The ACES Commercial Horticulture Team has strong partnerships with the following agencies for intensive outreach - the Alabama Fruit and Vegetable Growers Association, the Alabama Sustainable Agriculture Network, the Natural Resources Conservation Service (NRCS-USDA), Alabama Nursery and Landscape Association, Alabama Crop Advisors Association, and Federation of Southern Cooperatives. The organic agriculture program involves all three land-grant institutions in Alabama, i.e., Auburn University, Alabama A&M University, and Tuskegee University in order to provide consistent training to producers.

SUMMARY OF ACTIVITY AREAS (baseline and reactive programs together):

- Good Agricultural Practices (GAP) & Food Safety training for farmers
- Developing new Extension publications based on research on trap crops, hoop house fruit and vegetable production, organic pest management, etc.
- On-farm demonstrations related to integrated pest management (IPM), cultural practices, and new cultivars.
- Specially funded project for increasing the adoption of IPM on conventional and organic fruit and vegetable farms.
- Specially funded project on fire ant management in Alabama (state funded project).
- Professional development training for REAs on IPM and program evaluation techniques through face-to-face meetings and Web conferences.
- Assistance program for local producers affected by tornadoes in central and north Alabama.
- Food processing, marketing and consumer education - The development of Chilton Food Innovation Center in 2011 was facilitated by a Regional Extension Agent (Gary Gray). The center is currently open and making tremendous social impact. REAs also lead the development of Greensboro Farmers Market in order to provide a source of economic benefit for producers.
- Assisting producers in diversifying income via specialty crops: REAs assisted producers with market feasibility studies for specialty crops like bamboo, blueberries, grapes, etc.
- Immigration training program: The shortage of agricultural labors due to new Alabama regulations

(House Bill 56, passed on June 9th, 2011) was a sudden development to which the Commercial Horticulture REAs reacted very strategically. The Team participated or facilitated grower meetings and webinars about immigration issues. ACES is also updating a publication on the Federal H-2A program to make it available to the producers.

- Training of Urban Farmers: Cities in Alabama are expanding in population and many inner city dwellers do not have access to fresh food. Urban farms, as community wide initiatives, are becoming a popular source for locally produced foods that is bringing nutritional benefits to city population. The Commercial Horticulture Team is providing the expertise to clientele from crop production to consumption. The REAs are actively assisting the urban farms in sustainable agriculture.
- Training program for Master Gardeners: All REAs and Specialists in this Team participated in Master Gardener training events organized by ACES Home Grounds Team (over 35 programs completed in 2011) educating about 900 gardeners about backyard fruit, vegetable and flower production, and lawn maintenance. Master Gardeners also provided over 200 hours of volunteer service to the backyard vegetable IPM program valued at $3600. About 35% of phone calls for some REAs comprise of backyard food production questions which indicate strong relevance of this activity.
- Numerous field visits (400 approx.) were made by REAs and Extension Specialists to resolve critical crop production and plant protection issues. Farmers are provided research-based information that they can immediately use resulting in over 90% adoption rates for crop production recommendations.
- Success stories from Commercial Horticulture Team Members:
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f10f66ef0dfa
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f036bf5daa13
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4da4ea7a65d81
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4da37618023d7
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f10f66ef0dfa
  https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f07b7c1c31e0

2. Brief description of the target audience

ACES Commercial Horticulture Program is multifaceted that reaches to a variety of audience. In 2011, nearly 8,882 participants that attended 212 meetings conducted statewide. The Commercial Horticulture Team also conducts an Annual Fruit & Vegetable Conference that was attended by 210 participants in 2011 - an increase of 110% over the year before. The statewide audience included:

- Conventional fruit and vegetable producers
- Urban farms (Huntsville, Birmingham, and Montgomery)
- Nursery and landscape producers
- Young and beginning farmers
- Certified Crop Advisors
- Low resource farmers
- Organic producers
- Master gardeners
- Home owners
- Community leaders and policy makers (like the Alabama State Department of Agriculture)
- Farm workers (including immigrant population)
- Youth members
- USDA/NRCS personnel (hoop house and organic projects)
- School teachers
- Jail inmates (through a special project in Clay County)

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3. How was eXtension used?

The Commercial Horticulture Team is very active in three eXtension Communities of Practice (CoP). Overall, the REAs responded to 48 'Ask the Experts' queries to resolve fire ant issues relevant to Alabama producers.

Fire ant eXtension: The entire Commercial Horticulture Team participates in the Fire Ant eXtension through the educational program lead by Dr. Kathy Flanders at Auburn University. The Fire Ant Management Program provides support to REAs for travel and demonstrations. This Community of Practice (CoP) was discussed at over 5 grower meetings and through demonstrations of a working bait spreader in various counties. This is one of the oldest eXtension CoP with a very high visibility and excellent participation from Commercial Horticulture REAs and Specialists.

All about Blueberries eXtension: The home page for All About Blueberries CoP content is www.extension.org/blueberries. Within this resource area, there are articles on the following topics: blueberry production, blueberry diseases, blueberry health benefits, blueberry canning/freezing/storing, blueberry recipes, blueberry youth topics and blueberry links. Online learning interactive lessons include fruit production for growers, health benefits of blueberries, two Moodle courses, videos and blueberry activities oriented toward youth. Some of this content was created by the Commercial Horticulture team members. The REAs conducted 5 eXtension meetings where the producers were made aware of the resources. The blueberry CoP homepage also includes links to social media pages/channels. By the end of 2011, the blueberry CoP has 796 Facebook fans; 127 Twitter followers; 2,722 Word Press views; 2,317 Flickr views; 2,490 You Tube views; total of 114,049 page views coming from 22 countries and 5 continents.

eOrganic: The Team also participates in eOrganic through the Extension IPM program lead by Dr. Ayanava Majumdar, Extension Entomologist. This is one of the newest introduced CoPs for REAs and one

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	9925	1114829	150	0

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	4	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- This program area will include numerous output activities and methods as part of the Extension Team Projects (ETPs) which are described/explained in the prior "outcome activities and methods sections." The success of many of these outcomes will be formally evaluated/measured by using individual activity evaluation forms designed specifically for each activity, the success of other activities and methods will be measured by the level of participation in the activity. In the target boxes below for each year, we are indicating the number of individual activities within the ETPs for this program area that will be formally evaluated using an evaluation instrument designed specifically for that activity.

Year	Actual
2011	0

Output #2

Output Measure

- Management of exotic pests ex. Asian citrus psyllid
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Integrated pest management education/adoption

Year	Actual
2011	22

Output #4

Output Measure

- In-state educational meetings

Year	Actual
2011	212

Output #5

Output Measure

- On-farm demonstrations in pest management, new cultivar evaluations, and cultural practices

Year	Actual
2011	49

Output #6

Output Measure

- Horticulture training for Extension faculty and Master Gardeners in fruits, vegetables, turf, and ornamentals

Year	Actual
2011	35

Output #7

Output Measure

- Multi-state/agency planning and implementation of commodity meetings for experienced and novice producers

Year	Actual
2011	72

Output #8

Output Measure

- On farm consulting

Year	Actual
2011	400

Output #9

Output Measure

- Special training program for high tunnel crop producers (new in 2011)

Year	Actual
2011	8

Output #10

Output Measure

- Organic vegetable production & IPM campaign (new in 2011)

Year	Actual
2011	7

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	ACES employees will provide a success story on the program activity which they felt best demonstrates the impacts of their work. These success stories contain the following elements: Why: Explain the reason the program was done, or the situation or problem that the program addressed What: Specifically what was done and how it was done. When: If this was a one-time event, the date it occurred. If it is was a series of events, or an on-going program, when it began. Where: Specific location-- the county or counties involved. Who and how many: The "who" includes both who did the program and who were the clients of the program, as well as how many people were served. So what: This is the part that gives the real meaning to "success". The basic question to be answered in this part is "what difference did this program make". The difference may be measured in terms of dollars, or in changes in habits, lifestyles or attitudes. Whenever possible use numbers to show the effect of the program. If it is not possible to use numbers, provide a qualitative measurement like client comments or another type of testimonial about the program.
2	Integrated pest management adoption
3	Commodity educational meetings
4	Extension faculty and master gardener training
5	On-farm demonstrations
6	Multi-state/agency commodity meetings
7	Asian citrus psyllid and citrus greening disease education and management
8	Increase adoption of horticultural crop production and pest management recommendations through on-farm consultations
9	Special training program for high tunnel crop producers to increase adoption of appropriate crop production practices (new in 2011)
10	Increase adoption of organic vegetable production and insect pest management tactics in Alabama (new in 2011)

Outcome #1

1. Outcome Measures

ACES employees will provide a success story on the program activity which they felt best demonstrates the impacts of their work. These success stories contain the following elements: Why: Explain the reason the program was done, or the situation or problem that the program addressed What: Specifically what was done and how it was done. When: If this was a one-time event, the date it occurred. If it is was a series of events, or an on-going program, when it began. Where: Specific location-- the county or counties involved. Who and how many: The "who" includes both who did the program and who were the clients of the program, as well as how many people were served. So what: This is the part that gives the real meaning to "success". The basic question to be answered in this part is "what difference did this program make". The difference may be measured in terms of dollars, or in changes in habits, lifestyles or attitudes. Whenever possible use numbers to show the effect of the program. If it is not possible to use numbers, provide a qualitative measurement like client comments or another type of testimonial about the program.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Integrated pest management adoption

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	22

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vegetable production is Alabama is worth over $20 million and those producers often are also fruit producers. Insect pests are one of the severe challenges to fruit and vegetable production; there is zero tolerance of insect pests in some vegetable crops since they are high value commodity. Unmanaged insect pests can cause 100% yield loss in marketable produce. Organic vegetable producers have a bigger challenge in pest management since OMRI approved insecticides are short-lived and slow acting.

What has been done
Vegetable and fruit producers receive hands-on training in integrated pest management (IPM) as a baseline program. On-farm IPM demonstrations are often result of reactive programing where the goal is to train producers regarding a critical pest management issue. In 2011, over 22 vegetable IPM events were organized by REAs that reached over 600 producers. This Team is also partnering with nonprofit agencies, community groups and urban farms in conducting innovative IPM programs.

Results
The Alabama Vegetable IPM program was revitalized in 2009 using new grants and streamlined program delivery with a farmer-centric approach. Published literature indicates that the cost: benefit ratio of insect control in vegetables is about 1:16 (i.e., $16 return for every dollar spent) due to very low or zero tolerance of insects on certain crops. Extension surveys conducted by REAs and Specialist (Dr. Majumdar) during events, online evaluations, and on-farm interviews

indicate that commercial farmers make about $248 per acre gain by using IPM tactics recommended by ACES Commercial Horticulture Team. Adoption rate for IPM tactics and publications among commercial farmers receiving direct training is about 62% in 2011, which is an improvement of 24% in three years. Thus, IPM training program must continue to assist farmers in protecting their crops in an environmentally friendly manner. Small producers and gardeners use IPM publications that have been revised and improved resulting in better IPM decision-making. Some barriers to knowledge transfer have also been removed after multiple years of consistent programming statewide.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Commodity educational meetings

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	212

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
All Commercial Horticulture REAs identify issues based on direct input from farmers, advisory boards, commodity organizations, and consumers. The critical crop production issues are then prioritized during the Plan of Work process and then programmatic resources are utilized to mitigate issues. Some identified issues in 2011 included integrated pest management training, crop cultivar selection and planting methods, fertilizer dosage and delivery systems, cover cropping, organic fruit & vegetable production, hoop house crops, pesticide safety, food safety, processing, and marketing. Immigration law and H-2A labor availability were also critical issue in 2011.

What has been done
Nearly 212 education meetings and one major statewide conference have been done that incorporated joint effort of REAs and Extension Specialists. These meetings were attended by over 8,800 participants that included conventional fruit and vegetable farmers, organic and naturally grown family farmers, low resource farmers, new and beginning, hoop house producers, crop advisors, gardeners, USDA/NRCS personnel, youth members, school teachers, etc. REAs also answered over 12,535 phone calls and 16,720 emails from variety of clients.

Results
Commercial Horticulture baseline programs and reactive programs are highly relevant to the crop producers of Alabama. The large number of meetings and participation in them indicates high relevance of our Commercial Horticulture programs. Over 90% audiences that come to Extension meetings indicate strong preference to continuation of their training. The CH Team members also provided about 300 on-site consultations to rural and urban farms as an invaluable service. Extension surveys conducted by REAs and Specialists suggest a minimum impact of $8 to 10 million on fruit & vegetable industry. More in-depth impact assessment instruments are under development by this Team.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Extension faculty and master gardener training

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Home horticulture or backyard crop production is an activity that has increased significantly in recent years. Producing edible fruits and vegetables in the backyard requires training well-rounded training in crop production, plant protection, food safety, and storage. About 30-30% of total phone calls received by some Commercial Horticulture REAs are regarding backyard fruit and vegetable production. Master Gardeners (MGs) also needed training in pest management tactics since pest spectrum is varied in rural/urban settings.

What has been done
REAs from this Team participated in over 35 MGs and urban gardening training programs organized (in majority) by the ACES Home Grounds Team. About 900 participants received crop production and pest management training from REAs/Specialists on this Team. The Baldwin County Master Gardeners have been participating intensively in integrated pest management garden plots which has provided over 200 hours of volunteering opportunity for MG Interns in 2010 and 2011. In 2011, the Lauderdale County MGs also participated in the IPM program.

Results
MG groups provide consistently high (80%) survey return rates for Extension surveys which results in consistent information. The pest management training received by Baldwin County MGs increased awareness about IPM issues by 50% or more after completing hands-on insect identification training. Almost 100% MGs who undergo IPM training request further continuous training on pest identification and management issues, especially using organic gardening approaches. A comprehensive assessment of behavioral changes and economic impacts after crop production and IPM training is yet to be measured, but trends strongly favor continued focus on urban/rural gardeners from this Team via joint program with other ACES Teams.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

On-farm demonstrations

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	49

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Fruit/vegetable cultivars and pesticide formulations can change significantly from year to year. This is also true in case of nursery/landscape industry and home garden pest control. There are over 28 different chemistries of conventional insecticides (Restricted Use Pesticides) and 12 product classes for organic crop producers. Thus, farmers and gardeners need constant research-based (and unbiased) information from Extension regarding cultivar evaluations and appropriate pest management materials.

What has been done
The Commercial Horticulture Team of REAs and Specialists established nearly 49 demonstration plots related to cultivar selection, specific pest management tactics like insecticide rotations and trap cropping, disease monitoring, plasticulture, and drip irrigation systems. Every site was used for one of more Field Days or extension events that provided hands-on training to farmers and gardeners.

Results
Demonstration plots are always very popular among farmers, irrespective of the size of their operation. Pest management demonstration plots showcasing insecticide rotations and trap cropping system were highly successful (107 participants at 4 locations statewide). The IPM Field Days attracted many new and beginning crop producers (2%) and low resource farmers (10%), naturally grown family farmers (34%), besides conventional producers (50%). Lack of IPM training was at 30% of total before the training events. About 90 to 100% audiences attending commercial horticulture demonstrations strongly support future training events because it is easy for farmers to adopt new cultivar or IPM recommendations after they have seen it successful on demonstration farms.

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
215	Biological Control of Pests Affecting Plants

216 Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Multi-state/agency commodity meetings

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
This report pertains to the major annual producer conference statewide, not the regional meetings that have been reported elsewhere. The Alabama Fruit & Vegetable Growers Association (AFVGA) partners closely with the ACES Commercial Horticulture Team in conducting a statewide annual meeting every year. This annual meeting is the only multi-track event currently available for fruit and vegetable producers (new/experienced/conventional/organic/low resource farmers/gardeners) to provide them advanced training in fruit and vegetable production methods, new cultivar selections, fertilizer recommendations, invasive insects, beneficial organisms, alternative pest management tactics, etc.

What has been done
The first day of this event trains producers hands-on and in-field regarding cover crops, sprayer calibration, conservation tillage systems, plasticulture, pruning methods, and correct soil sampling. The second day of the event consists of as many as 25 presentations by crop production/pest management/food saftey experts from Alabama as well as other states. Together, this meeting provides a well-rounded training opportunity that covers topics in-depth at a broader level than regional meetings. Farmers attending the annual conference are strongly encouraged to attend the regional fruit and vegetable production meetings as a follow-up training to learn about local issues.

Results
In the past two years (2010, 2011), the AFVG Annual Conference has been attended by over 360 crop producers and crop advisors who have adopted Extension recommendations. USDA NRCS personnel also attended the meeting for training on high tunnel crop production. Compared to

2010, the participation increased by 40% in 2011 conference indicating strong support for this annual event. Program quality surveys completed in the past two years indicate that growers from nearly 22 counties of Alabama attend the event each year. About 70% audience rated event location and facilities as excellent. Adoption rates for new crop production recommendations by active farmers: food safety (66%), greenhouse/hydroponics (93%), soil fertility (92%), high tunnel crop production (84%), improved fruit & vegetable cultivars (84%), and pest management (100%). Audience members are provided thousands of Extension handouts at this event in folders that they can keep for future reference.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

Asian citrus psyllid and citrus greening disease education and management

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Increase adoption of horticultural crop production and pest management recommendations through on-farm consultations

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Commercial Horticulture REAs and Specialists serve clienetele via emails and phone calls. In 2011, it is estimated that the Team responded to 12,535 phone calls and 16,720 email queries which shows excellent strength in reactive/issue-based programing. About 5,300 farmers, gardeners, crop advisors, NRCS and industry personnel are also on various email newsletter subscription lists. Often, the emails and phone calls lead to on-site visits for resolving critical crop production issues related to fruit and vegetable production as well as nursery and landscape issues.

What has been done
In 2011, various Team members together completed about 300 field visits on special request and provide consultation that is critical to the farmers. Farmers are always provided research-based information that is unbiased and immediately useful.

Results
Although there is no formal framework for evaluating the success of field visits, Commercial Horticulture Team members do follow-up telephone calls and meetings with farmers to determine usefulness of their recommendations. Many of the farmers are regular attendees at Extension meetings done by this Team indicating relevancy of the service to them. Based on follow-up informal surveys, it is estimated that adoption rate for crop production recommendations after field visits average over 90%. Cultivar selection, pruning methods, fertilizer and pest management recommendations are immediately adopted by farmers since it is vital for them to stay in business and adapt to new technologies.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #9

1. Outcome Measures

Special training program for high tunnel crop producers to increase adoption of appropriate crop production practices (new in 2011)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Natural Resources Conservation Service (USDA) initiated the EQUIP program few years back that provided thrust to high tunnel crop production. Many moderate to small vegetable producers have received the NRCS grant but the farmers lacked know-how for crop production inside a high tunnel. The ACES Commercial Horticulture Team was requested to provide assistance to producers as well as NRCS field agents to help with the transition.

What has been done
This Team has developed seven statewide publications on high tunnel crop production related to construction materials, planting and irrigation techniques, list of suppliers, insect control, ornamental and fruit production. These new publications complemented numerous existing Extension publications related to each major vegetable and fruit crop in Alabama. Thus a tremendous of amount of information was organized very quickly by the Team and made available to the producers during eight meetings. Some REAs and Extension Specialists also provided direct field visits to needy producers. Events were conducted in conjunction with NRCS and the Alabama Sustainable Agriculture Network.

Results
Farmers are increasingly utilizing crop production recommendations for high tunnel crop production. Separate meetings on high tunnel crop production, during regional meetings and annual conference, has allowed farmers to network among themselves and know the Extension resources. NRCS field agents now involve the Extension REAs in most of their educational events due to their technical knowledge. Direct field visits to the high tunnel crop producers has increased visibility of this new initiative.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #10

1. Outcome Measures

Increase adoption of organic vegetable production and insect pest management tactics in Alabama (new in 2011)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Organic crop production is a small industry in Alabama at present but it is the fastest growing agricultural enterprise supported by USDA Natural Resources Conservation Service and other private institutions. The hoop house crop production system is also closely linked to organic cropping system. ACES Commercial Horticulture Team is actively engaged in reorganizing the organic Extension education program in Alabama in order to provide thrust to this organic food production campaign.

What has been done
In the first step, the Commercial Horticulture team networked with organic farmers, urban farms (e.g., Jones Valley Urban Farm, Birmingham and Hampstead Institute, Montgomery), and supporting agencies like the NRCS, the Alabama Sustainable Agriculture Network (a farmer grassroots group), local food production initiatives (e.g., Fairhope), food banks (e.g., Food Banks of North Alabama at Huntsville), and the Alabama Department of Agriculture and Industries. Small demonstration plots showcasing trap cropping and insecticide rotations were set up by Home Ground REAs and Commercial Horticulture REAs where field days were conducted as a preliminary effort.

Results
The IPM Field days (4) and presentations (3) were very well attended by over 150 audience members. The high interest of small and low resource producers to observe alternative pest management systems despite the incredible heat levels in Alabama during summers was an indicator for high relevance of our initiative. The audience included naturally grown producers (34%), organic producers (10%), new/beginning farmers (2%), gardeners (45%) and conventional producers (8%). About 25% attendees coming to Extension organic meetings did not have prior IPM training and were extremely satisfied with the hands-on exercises (plot size had no

relationship to the number of audience but location of demonstration plots was important). Lack of awareness of Extension programs and high cost of organic inputs are some barriers that participants indicated as problems that are focus of our continued efforts to support the growing organic food industry. This team is now involved in supporting local agricultural production and marketing systems, sustainable urban farms, and policy councils as part of various grants in the pipeline.

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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Rising age of farmers, low availibility of new insecticides)

Brief Explanation

Rising average age of experienced producers (56 years) is also a concern that affects adoption of new agricultural recommendations.

• We lost a trap crop demonstration site in north Alabama to the devastating tornado in April 2011. REAs from this Team helped relief workers and rebuild affected communities.
• Difficult economic conditions of farmers does not allow them to travel to far away educational events, so the participation is sometimes low.
• Organic producers suffer greatly from the poor availability of pest management products like biopesticides in local stores.
• Conventional producers may not find the new environmentally-safe insecticides and other inputs at the distributor resulting in low adoption of crop production recommendations.
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V(I). Planned Program (Evaluation Studies)

Evaluation Results

The Commercial Horticulture Team focuses on program monitoring and evaluations via Extension surveys done at events and after farm visits. Programming models used by Team members include: Program Logic Model Framework (USDA-NIFA and internal ACES),

Extension Evaluation Logic Model (University of Wisconsin 2003), and Transformation Extension Education Model (Rockwell et al. 2003).

The overall evaluation/feedback system also allows the Team to track technology adoption rates, barriers, and program impacts. A variety of qualitative and quantitative information is compiled every year by REAs and discussed during professional development meetings for training purposes (this ACES team has completed 2 evaluation capacity building events in 2011). Evaluation results are also discussed monthly during Team video conferences resulting in high awareness of the evaluation process. Here are evaluation findings from some major horticultural programs.

- In 2011, the ACES Commercial Horticulture Team members provided approximately 697 hours of training via 230+ Extension meetings reaching 8,882 audiences across Alabama. About 60% of the audiences (~ 5,300) are also on email lists for receiving newsletters from REAs serving their area. Based on newsletter and field day surveys conducted by this group, a conservative estimate of technology adoption rate is about 35-90% depending on the type of audience and the need.
- Surveys indicate that small conventional or organic producers and gardeners are often able to adopt new production/pest management practices quickly but large farmers may take two years or more years to transition to a new system. Age of farmer and market fluctuations also moderate adoption of improved crop production practices.
- The REAs answered over 12,535 phone calls and 16,720 emails from variety of clients. Team members provided 400 on-site consultations to producers (rural + urban) and gardeners. It is estimated that this type of reactive programming is highly effective in changing attitudes and behaviors in over 90% of the clientele.
- The Greensboro Farmers Market was initiated by a Commercial Horticulture REA (Gary Gray) in 2011 with assistance from several other REAs from other Teams. Students from the Rural Studio at the Rural Heritage Center in Thomaston (AL) designed portable market stands that the farmers could use at this new market. A highly successful marketing campaign resulted in about 150 visitors per Market Day that generated up to $300 in revenue for 8 vendors. The City Officials and farmers are highly impressed by ACES efforts that led to a substantial social and economic impact (see link to full story below).
- Another REA (William East) initiated the gardening project at Clay County Jail to benefit the inmates. The inmates took active participation in the project and raised enough vegetables for local consumption. The project was supported by the Sheriff and his spouse, who are very pleased with the outcomes of this unique project.
- The Vegetable IPM program Specialist (Dr. Ayanava Majumdar) has been awarded the Southern Region IPM Center's 'Friends of IPM-Future Leader Award' recognizing the high program quality and impact it has made statewide. Since 2008, many Commercial Horticulture REAs assisted in this IPM initiative and conducted evaluations. Findings are as follows. Over 2,500 vegetable producers have received direct IPM training at meetings, workshops, and conferences (74 completed in three years). Extension publications are used by over 75% farmers and IPM adoption rate is about 62% (growth rate of 8% annually). The vegetable entomology website gets about 100 hits per day during the summer season; 600+ farmers are subscribed to the IPM newsletter; over 120 farmers are on 'Alabama Vegetable IPM' Facebook page. The average size of conventional vegetable farms is 23 acres, organic farm is 4 acres, and low resource farms have less than 2 acres of land.
- The IPM newsletter (called 'The Alabama IPM Communicator') provides $500-1,000 benefit to farmers adopting pest management recommendations. About 68% respondents regularly visit ACES website for IPM information.
- The Baldwin County Master Gardeners, who establish and maintain a vegetable IPM demonstration garden in Fairhope, have donated time (210 h) worth nearly $3,700 in 2011.

- Impact assessment for vegetable IPM program (2009-2011): Crop loss without IPM can be nearly 100% for some crops. Average return on investment is 1:16 ($16 benefit for $1 investment in IPM). Survey results also indicate adoption of university recommended IPM program in Alabama saves about $247 per acre (insecticide cost savings). It is estimated that the IPM program leads to $1 to 1.5 million in savings statewide due to reduced use of insecticide, more energy efficiency and environmental benefits, and farm profits from timely pesticide applications.
- The Peach Production meeting in Clanton is attended by majority of the area peach producers who cumulatively increase their production by $4 million, based on on Extension surveys.
- The overall Team impact on the horticulture industry resulting from various programs is about $8-10 million (a conservative estimate).
- Success stories are listed in the next segment.

Key Items of Evaluation

The Team Leader (Dr. Ayanava Majumdar) of Commercial Horticulture Program is a certified evaluation practitioner with continuing education credits from the Southeast Evaluation Association and the American Evaluation Association. Dr. Majumdar and Assistant Director (Dr. Paul Mask) have conducted three capacity building workshops for this Team in the past two years that has led to a firm commitment to Extension evaluations as a core activity. The Commercial Horticulture Team conducts Extension process and outcomes surveys at each meeting; results are shared through annual progress reports. Below are unique details about our award-winning programs and publications.

Extension evaluation capacity building initiatives (since 2009):

- Developed an evaluation training module with 3 new Extension bulletins & pocket guides for Extension Agents and Specialists. Dr. Majumdar received appreciation from USDA-NIFA regarding evaluation efforts and led a workshop for IPM State Coordinators in 2011.
- Launched Evaluation Toolkit website that archive publications (2010): https://sites.aces.edu/group/evaltoolkit/Pages/EvaluationArchive.aspx
- Majumdar, A., and P. Mask. 2011. Evaluation capacity building exercise-Part 1: Relationship between program outcomes and impacts. ACES Commercial Horticulture Team Plan of Work Meeting, Opelika, AL. September 21, 2011. 27participants. 60 min.
- Majumdar, A., and P. Mask. 2011. Extension Evaluations as part of the Logic Model. Workshop at the Annual Meeting of the Alabama Association of County Agricultural Agents and Specialists, Eufaula, June 2, 2011. 15 participants registered. 60 min.
- Majumdar, A.,and R. Williams. 2009. Measuring program outcomes and impacts. May 4, 2009. Extension Technology Web Conference. 75 participants. 30 min.

Recent success stories by Commercial Horticulture REAs and Specialists indicating program outcomes and impacts:

- Majumdar, A., G. J. Queen, J. D. Miles, C. M. Becker, L. E. Chapman, and W. E. Datcher. 2012. IPM exhibitions are an effective educational tool for organic producers. [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f287cad296db
- Majumdar, A., G. J. Queen, J. D. Miles, C. M. Becker, L. E. Chapman, W. E. Datcher, A. Jackson, J. Jacobi, E. J. Sikora, and J. M. Kemble. 2012. Statewide IPM campaign for gardeners, organic producers, and low resource farmers. [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f10f66ef0dfa

- Majumdar, A., R. Yates, B. Dillard, L. E. Chapman, W. T. East, G. D. Gray, N. G. Kelly, J. D. Miles, and M. D. Reeves. 2012. Long-term behavioral changes in certified crop advisors receiving entomology IPM training, 2001-2011 (PPA101). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f07b7c1c31e0
- Majumdar, A., C. M. Becker, L. E. Chapman, W. E. Datcher, W. T. East, G. D. Gray, N. G. Kelly, J. D. Miles, M. D. Reeves, E. J. Wheeler, and A. Jackson. 2012. Long-term outcomes and impacts of the Alabama statewide vegetable entomology IPM campaign, 2009-2011 (PPA110). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f036bf5daa13
- Majumdar, A., and G. McQueen. 2011. Impacts of the intensive IPM training on Baldwin County Master Gardeners, 2009 & 2010 (ETP20N). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4da4ea7a65d81
- Majumdar, A., L. Chapman, W. East, N. Kelly, J. Miles, M. Reeves, G. Gray, E. Wheeler, and C. Becker. 2011. Positive impacts of the statewide vegetable IPM educational campaign, Alabama, 2009 & 2010 (ETP19B/SPI405). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4da37618023d7
- Boozer, R., L. Chapman, E. Coneva, W. East, T. Glover, G. Gray, C. Hesselein, N. Kelly, A. Majumdar, J. Miles, M. Reeves, T. Tyson. 2010. ACES Commercial Horticulture Team responds to high tunnel educational needs (ETP19A). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4d83855aa17e5
- Majumdar, A. 2012. Community engagement bulletin. January 2012. http://www.aces.edu/pubs/docs/E/EX-0132/EX-0132-low.pdf
- Reeves, M., R. W. Britnell, L. D. Chapman, E. D. Coneva, K. L. Flanders, T. A. Glover, G. D. Gray, M. D. Henshaw, C. B. Pinkston, D. W. Porch, D. R. Shanklin, and R. D. Sims. Blueberry varieties highlighted at field day (PPA110). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f3044554b432
- Chapman, D., R. Boozer, W. T. East, D. Fields, G. D. Gray, N. G. Kelly, J. D. Miles, C. D. Monks, J. L. Novak, B. A. O'Rear, and M. D. Reeves. 2012. Alabama's New Immigation Law (PPA110). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f05c2ffa1c81
- Gray, G., W.E. Catcher, J. B. Gladney, D. R. Shirley, T. D. Smith, and K. L. Woods. 2011. Greensboro Farmers Market (SPI405). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4f0e123da9ba3

Success stories by Home Grounds REAs with significant input from Commercial Horticulture Team members:

- G. J. McQueen, W. K. Kelley, J. D. Miles, and A. Majumdar. 2011. Helping gardeners grow. (SPI403). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4ee8b132bfd3b
- Datcher, W., A. Jackson, A. Majumdar, J. Jacobi, K. B. Friday, W. H. Lampley, and J. D. Miles. 2012. Backyard gardeners and vegetable growers learn how to become creative when controlling pests (SPI403). [Online] https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4ee646dc762c5