

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Commercial and Consumer Horticulture

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
124	Urban Forestry	5%		10%	
202	Plant Genetic Resources	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	15%		15%	
205	Plant Management Systems	45%		40%	
502	New and Improved Food Products	15%		20%	
901	Program and Project Design, and Statistics	5%		5%	
903	Communication, Education, and Information Delivery	5%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	3.0	0.0
Actual Paid Professional	20.0	0.0	2.7	0.0
Actual Volunteer	29.3	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
450000	0	117434	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
450000	0	117434	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1350000	0	668000	0

### V(D). Planned Program (Activity)

#### 1. Brief description of the Activity

•Conduct research to evaluate cultivars of traditional and nontraditional horticultural crops and ornamental plants. •Conduct research into crop cultural systems, particularly the feasibility of horticultural crops in rotation with agronomic crops. Lead CoP for grape production for eXtension. •Conduct research to develop "seed to market" production systems for high-value alternative horticultural crops like cilantro and herbs. •Conduct research to develop sustainable and/or organic production systems for commercial horticultural crops. •Provide demonstrations and education and disseminate information to support Oklahoma's commercial horticulture industry, with emphasis on electronic resources. •Survey Oklahoma Consumers (Gardeners) at the county level to assess the needs and wants of the gardening public •Upgrade the web-based delivery •Review and revise annually or as needed Fact sheets and other publications •Educational programs focused on Consumer Best Management Practices (BMP) for the conservation of energy, water resources, water pollution prevention, Integrated Pest Management (IPM), and urban landscape wildlife conservation •Educational programs are conducted based on public interest and County Educator requests •Participate and support eXtension Consumer Horticulture/Master Gardener Community of Practice •Conduct Master Gardener/Junior Master Gardener Training •Conduct pesticide training and education •Provide Education on Backyard Food Production •Assist in Youth at Risk - Obesity/School Gardens

#### 2. Brief description of the target audience

Horticultural crop producers, commodity groups, food processors, landscape professionals, input suppliers such as seed and chemical companies, peer scientists, extension specialists and county professionals, horticultural dealers and merchants, greenhouses, Master Gardeners, home owners, communities, and youth.

#### 3. How was eXtension used?

In 2013 the Grape Community of Practice eXtension website was managed by an extension fruit specialist from another land grant institution and by an extension employee at Oklahoma State University. During 2013 efforts by Oklahoma State ceased regarding the Grape Community of Practice

due to the loss of the extension specialist that managed that webpage.

31 responses were provided by state specialists to users of eXtension through the Ask an Expert feature of the eXtension web site.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	109081	3650559	9500	250000

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	47	18	65

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- New Master Gardeners trained

Year	Actual
2013	322

**Output #2**

**Output Measure**

- Manuscripts submitted for consideration of publication in peer-reviewed journals

<b>Year</b>	<b>Actual</b>
2013	20

**Output #3**

**Output Measure**

- Number of Extension publications completed - fact sheets, newsletters, trial reports, web-based materials

<b>Year</b>	<b>Actual</b>
2013	85

**Output #4**

**Output Measure**

- Number of statewide "Oklahoma Gardening" shows produced

<b>Year</b>	<b>Actual</b>
2013	37

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of horticultural crop producers newly certified as organic
2	Number of volunteer hours provided to community horticulture programs statewide
3	Number of home gardeners experiencing increased awareness and knowledge about environmental issues and IPM principles
4	Outreach workshops to underserved horticultural food crop farmers within the state
5	Trialing tomato varieties with heat-set capabilities and using plasticulture to manage soil temperature and moisture levels. Number of trials.

## **Outcome #1**

### **1. Outcome Measures**

Number of horticultural crop producers newly certified as organic

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	6

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Organic produce is an important niche market for fresh market fruit and vegetable producers within the state. A segment of consumers are interested in having more certified organic produce available for purchase. As a result there is demand for more certified organic farmers who can fill this market demand.

#### **What has been done**

As a Land Grant institution Oklahoma State University has committed both people and resources to develop a research and outreach programs to provide research based information for organic farmers. In addition, this effort is in collaboration with the Oklahoma Department of Agriculture Food and Forestry's (ODAFF) Organic Certification program to provide both information and certification to increase the number of organic farmers available to fill this developing market.

#### **Results**

During the past 12 months six newly certified organic producers have been added to the ODAFF certified list.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
502	New and Improved Food Products

## **Outcome #2**

### **1. Outcome Measures**

Number of volunteer hours provided to community horticulture programs statewide

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	79829

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Rapid urban growth in many areas of the United States coupled with increased interest in the environment and home gardening have prompted an ever-increasing number of garden and landscape inquiries. Along with this interest, comes a multitude of gardening questions needing individual explanation and too few Extension staff members to answer each question. Many of these questions are seasonal in nature and are relatively easy to answer assuming that one has horticulture training.

#### **What has been done**

Oklahoma Master Gardeners are trained, supervised and recruited to: 1) improve overall efficiency in providing one-on-one service to the non-commercial horticulture clientele in the county, 2) provide group learning and teaching activities for non-commercial clientele, 3) allow agents to develop proactive Extension programs, and 4) form a group of Extension volunteers to support additional consumer horticulture efforts.

Trainees participate in a 10 - 13 week course receiving between 40 - 56 hours of course work on subjects including: basic plant science, vegetables, fruits, nuts, ornamentals, lawns, diagnosing pest problems, soils, and other related topics. Upon completion of the training period, satisfactorily passing an exam on materials and topics covered, and donating between 40 - 56 hours of volunteer time to the Horticulture program, the trainees are certified and awarded the title of Oklahoma Master Gardener.

Examples of Master Gardener Volunteer activities include: staffing plant clinics to answer phone and walk-in questions, manning educational exhibits, maintaining demonstration gardens, community beautification projects, serving as 4-H hort leaders and judges, speaking at club/civic meetings, teaching horticulture activities at nursing homes, etc., assisting in horticulture mailings, newsletters, etc., and appearing on TV and radio.

### Results

The service from the Master Gardener volunteer program has proven to be a highly popular means of extending the knowledge of the Oklahoma State University Cooperative Extension Service to the residents of Oklahoma. The Oklahoma Master Gardener Program now has 26 counties participating in the program as of January 2014. The following data was provided by 23 of the 26 counties. Approximately 322 new Master Gardeners were trained during the 2013 training season. Close to 1,244 active Master Gardeners volunteered their time, contributing approximately 79,829 volunteer hours resulting in over 9,967,280 educational interventions with Oklahomans and as many as 2,729+ educational and community programs and activities being conducted in their communities in 2013. This translates to over \$1,459,274.00 in service that was donated by volunteers (wage rate of \$18.28/hour was used, which includes a 12% estimate of fringe benefits. This hourly rate is the assigned wage for non-management, non-agricultural workers in 2011 for the state of Oklahoma as published by The Independent Sector, an organization that serves as a national forum to encourage giving, volunteering and not-for-profit initiative, [http://www.independentsector.org/programs/research/volunteer\\_time.html](http://www.independentsector.org/programs/research/volunteer_time.html)). Reports are gathered yearly at the beginning of the following year.

In addition to the many hours donated, approximately 9,344 pounds of produce was donated to local food pantries/kitchens, shelters, and other organizations throughout Oklahoma by the Master Gardeners.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
903	Communication, Education, and Information Delivery

### Outcome #3

#### 1. Outcome Measures

Number of home gardeners experiencing increased awareness and knowledge about environmental issues and IPM principles

#### 2. Associated Institution Types

- 1862 Extension

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
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2013

1017084

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Public concern for the environment continues to increase. Traditional landscape management practices have involved extensive use of pesticides, fertilizers, and other materials that could harm the environment if not used properly. Integrated Pest Management (IPM) uses biological principles, cultural practices, and some chemicals to control pest populations with minimal environmental impact.

#### What has been done

Over 2,792 workshops, educational programs/seminars and Oklahoma Gardening segments are used to educate the public of IPM practices and other related gardening topics.

#### Results

Homeowners are better educated and can make choices in maintaining the landscape that are more environmentally friendly.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
205	Plant Management Systems
903	Communication, Education, and Information Delivery

### Outcome #4

#### 1. Outcome Measures

Outreach workshops to underserved horticultural food crop farmers within the state

#### 2. Associated Institution Types

- 1862 Extension

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2013	5

#### 3c. Qualitative Outcome or Impact Statement

### **Issue (Who cares and Why)**

Underserved new and beginning producers of horticultural food crops have traditionally been difficult to contact due to the diverse locations and types of crops that they are growing. Because of this, the flow of information to these farmers has been limited. Basic information related to field preparation, soil fertility, pest management, crop management, and food safety is needed to increase these farms chances of being successful.

### **What has been done**

The project that was begun in 2012 was continued in 2013. Project funding was from a grant from the USDA Risk Management Agency (RMA). Five different workshop/field days were developed. Workshops were planned and completed with groups of new farmers including the Hmong in eastern Oklahoma and the Otoe-Missouria and Ponca tribes in north central Oklahoma. The workshop/field days were used to increase new and beginning horticulture food crop farmer's knowledge and skills. Skills taught included production risk management techniques such as business and insurance considerations, field preparation, soil fertility, plasticulture, cover crops, pest management, and food safety considerations.

### **Results**

At the first workshop in eastern Oklahoma nearly 52% of the participants agreed they would evaluate practices to reduce risk in their specialty crop businesses. Afternoon sessions included hoop house crop production, cover crop management, no-till methods for vegetable production, and setting vegetable transplants. The season extension presentation was particularly popular. As a result of the first workshop, producers estimated the economic benefit to their operations somewhere between \$250-500 and one estimated a benefit between \$2,250-2,500. The second workshop in eastern Oklahoma covered topics on soil fertility, pest management, testing for soil moisture levels, managing drip irrigation, and produce washing techniques. Afternoon sessions covered developing a farm food safety plan including good agricultural practices, good manufacturing practices and using the grower self-assessment publication for food safety risks to develop a risk assessment of their farms. Nearly 70% of participants gained new information about food safety practices. Overall 70% of participants gained new ideas on how to prevent production problems from occurring including crop growth, weather, and food safety hazards. As a result of participation in this second workshop producers estimated that their operations would benefit between \$250-1,000 and one producer estimated his benefit as more than \$2,500. A third workshop was held in eastern Oklahoma due to producers requesting help on learning about pesticide safety and calibration of sprayers. This workshop was a joint effort with the horticulture and entomology and plant pathology departments. It covered pesticide label considerations including personal protective equipment, pesticide application, pre-harvest intervals, etc. Also included in the workshop were demonstrations on calibrating hand-pump and tractor-PTO driven sprayers.

Two workshops were completed in north central Oklahoma with the Otoe-Missouria and Ponca tribes. The first workshop in April covered soil fertility, season extension using plasticulture, crop planning for different seasons, soil preparation and installation of plastic mulch and drip irrigation. All participants strongly agreed that they had gained in knowledge about areas covered by the workshop. Also covered at this workshop was the use of risk management techniques including government support options. Nearly 63% of participants agreed that they would evaluate practices to reduce risk in their specialty crop businesses. Afternoon sessions at this workshop included high-tunnel crop production, leafy greens, cover crops, and reduced tillage options for production of vegetable crops. Producers at the first workshop estimated that the economic benefit to their farms would range from \$750 to \$1000. One farmer stated that the economic benefit would exceed \$2,500. The second workshop with this group was completed in July and

focused primarily on food safety issues connected to the production and sale of fresh produce. The workshop included field demonstrations in the morning including pest scouting, pest management, managing drip irrigation, and washing fresh produce. Following lunch, presentations were given on Good Agricultural Practices, Good Handling Practices and marketing of fresh produce. Estimated economic benefits from the two workshops ranged from \$250 to \$1,000 for a large percentage of the participants while several estimated the benefit to be over \$2,500.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
903	Communication, Education, and Information Delivery

#### Outcome #5

##### 1. Outcome Measures

Trialing tomato varieties with heat-set capabilities and using plasticulture to manage soil temperature and moisture levels. Number of trials.

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	5

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Oklahomans want locally grown fresh produce and tomato is one of those produce items that are a ?must have? item for consumers within the state. Tomatoes have been produced in Oklahoma since people began gardening here. Within the vegetable crop group, tomatoes require high levels of management and attention to detail in order to be successful. One of the biggest problems for tomato growers is fruit set which usually stops completely during the hotter periods of June and July. In 2011 and 2012, farmers had difficulty growing tomatoes for market due to the intense hot weather that was experienced. Farmers continue to request help with this ongoing problem.

###### **What has been done**

During 2013 five different tomato trials were completed within the state. Trial sites were located in Noble (north-central), Tulsa (eastern), Payne (central), and Blaine (western) areas of the state. These trials were partially supported by a specialty crop grant from the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF). On-farm trial sites received the same 12 tomato varieties for testing in a replicated trial with three replications. The majority of sites used drip irrigation and plastic mulch for crop management.

#### **Results**

Results from the first year of this two year study were published in the Oklahoma State University Vegetable Trial Report MP-164 which is available at: <http://www.hortla.okstate.edu/research-and-outreach/research/pdfs/13vegreport.pdf>. Tomato cultivars that performed well in 2013 included Solar Fire, Bella Rosa, Tribeca, and Tribute. These cultivars were in the top 5 cultivars at a majority of locations during the 2013 season. Results were presented to commercial tomato growers at the 2014 Horticulture Industry Show. Farmers are interested in seeing results from upcoming trials during the 2014 season. As in 2013 multiple trials are planned for 2014 with locations ranging from eastern Oklahoma to western areas of the state.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

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

##### **Brief Explanation**

External factors include drought and extreme high temperatures that have resulted in low production of tomato fruit for fresh market within the state.

#### **V(I). Planned Program (Evaluation Studies)**

##### **Evaluation Results**

Tomato cultivars that performed well in 2013 included Solar Fire, Bella Rosa, Tribeca, and Tribute.

##### **Key Items of Evaluation**