Alabama Department of
Agriculture & Industries

Specialty Crop Block Grant Program

Final Report

2014 SCBGP
14-SCBGP-AL-0001

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For: Patricia Atkins

February 15, 2018
# 2014 SCBGP Proposal Selections

**USDA Allocation = $483,202.15**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Project Title</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>ACES</td>
<td>Determination of Production Costs and Viable Market Strategies for Ethnic Vegetable Crops for Sustaining Small Farms in Alabama</td>
<td>$24,959.00</td>
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<tr>
<td>Alabama Green Industry Training Center, Inc.</td>
<td>Specialty Crop Training Initiative</td>
<td>$25,000.00</td>
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<tr>
<td>Auburn University</td>
<td>Economic Impact Analysis of the Alabama Fruit and Vegetable Industry</td>
<td>$24,838.00</td>
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<tr>
<td>Auburn University</td>
<td>Innovative Bunch Grape Production Technologies for Enhanced Sustainability of Local Food Systems</td>
<td>$24,183.00</td>
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<tr>
<td>AADA</td>
<td>A Pilot Program Utilizing Plasticulture in School/Community Gardens to Create Healthy Lifestyles</td>
<td>$16,192.00</td>
</tr>
<tr>
<td>Auburn University</td>
<td>Utilization of Novel Irrigation and Fertilization Practices to Enhance Pecan Production in Alabama</td>
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<td>ADAI</td>
<td>Natural Pollinator Enhancement Project</td>
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<td>AUM</td>
<td>Small Fruit &amp; Nut Teaching Demonstration</td>
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<td>Hawk’s Park Outdoor Learning Center</td>
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<td>$14,593.00</td>
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<td>Mobile Housing Board</td>
<td>Seed to table</td>
<td>$20,000.00</td>
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<td>ALFA</td>
<td>Enhancing greenhouse lettuce production through non-traditional heating and cooling systems</td>
<td>$24,949.00</td>
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<td>Trinity Gardens Community Gardens</td>
<td>Trinity Gardens Community Gardens</td>
<td>$23,310.00</td>
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<td>Promoting Competitiveness of Specialty Crop Industry in Alabama through Intensive Grocer Training and Resource Development</td>
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<td>FBC-Community Ministries, Inc</td>
<td>The Master’s Garden in Montgomery’s Chisholm Community</td>
<td>$24,997.00</td>
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<td>EAT South</td>
<td>Good Food Day</td>
<td>$26,590.00</td>
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<td>UWA</td>
<td>Bio-BOOM: Boosting Crop Production using Alabama Specific Symbionts</td>
<td>$22,510.00</td>
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<td>East Alabama Beekeepers Association</td>
<td>A project to enhance food safety in regional small scale honey production by reduction/elimination of contaminates utilizing practices for better process control in local honey crops.</td>
<td>$25,000.00</td>
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<tr>
<td>Alabama Department of Agriculture</td>
<td>In-direct cost</td>
<td>$35,064.85</td>
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**Total:** $473,375.44
Determination of Production Costs and Viable Market Strategies for Ethnic Vegetable Crops for Sustaining Small Farms in Alabama

Project Summary
The value of fresh market vegetables in the US was $10.9 B in 2010, but the US remains a net importer of fresh market vegetables, mainly from Mexico. Alabama, with 7,100 acres of vegetable production ranked 25th compared to 3rd ranking Georgia (155,000 acres). Thus, Alabama has the potential and the need for increasing vegetable production. The overall US organic foods market exceeded $31 billion in 2011 and demand for organic foods continues to increase. Alabama's Hispanic and Asian populations grew by 145% and 71%, respectively between 2000 and 2010. The increasing demand for both ethnic foods and organic foods offers Alabama farmers tremendous opportunities to diversify, expand, gain by catering to these multicultural foods. Production of high value ethnic crops such as chayote, eggplant, cilantro, tomatillos and a variety of peppers that are much sought after by ethnic immigrants in Alabama can help keep small farm enterprises viable because of greater returns from lower land and capital investment.

Like many southeastern states, Alabama has been experiencing increase in immigrant populations, particularly Hispanic and Asian mainly to cater to agricultural and technological needs of this state. According the US census of 2010, there were 1.5 million Mexicans, 53 percent more than in 1990; almost 900,000 Chinese, 48 percent more; and 800,000 Asian Indians, a population that rose by 106 percent nationwide. In certain counties in Alabama, the Hispanic population growth was 123% between 2007 and 2010. Most of these immigrants have considerable disposable income in excess of their subsistence needs. Most of them are willing to pay premium prices for vegetables they grew up eating back in their countries of origin, and have a longing for tasting them again. Some organic growers in Georgia have recognized this niche market and are catering to these small but lucrative markets.

The purpose of this project is to introduce ethnic vegetable crops for commercial cultivation using organic production methods on limited resource and small farms in Alabama. The approach is to screen several Hispanic vegetable crops such as chayote, tomatillos, peppers, and Asian vegetables such bitter melon, eggplant, bocchoi, Malabar spinach, edamame (vegetable soybean), radishes, etc., for growth and yield performance, and insect and disease resistance in replicated field trials at the Alabama A&M University Research Station. In the following year, demonstration plots of selected vegetable crops were established on at least three farms located in counties with heavy immigrant populations in Alabama. Outreach efforts aiming at educating farmers and extension service providers included media such as fact sheets, commodity sheets, pamphlets and brochures. Additionally, open/field days were held at these demonstration farms to ‘show and tell’ local farmers about these ethnic vegetable crops. Extension experts have found that consumers unfamiliar with ethnic vegetable crops are more comfortable making a purchase when preparation instructions and/or recipes are provided. One of the partners on this project, Indigo Market, LLC demonstrated cooking for attendees, particularly the non-ethnic community members to expand consumer base for these crops.

Project Approach
In this project, it was proposed to primarily introduce and demonstrate new and emerging ethnic crops with potential for commercial production in Alabama using organic production systems. In year 1, a wide range of ethnic vegetable crops were assessed for growth and yield performance in replicated field trials at the Alabama A&M University Experiment Station. In year 2, selected varieties were established in demonstration plots on 6 farms across Alabama. Outreach efforts included farmer-to-farmer education, workshop for educating farmers and extension service providers, and through other multiple media.

It is expected that results from this project will help to stimulate local and regional growth of specialty vegetables and improve the financial status through marketing of vegetables by small and medium-sized growers. We also expect local demand to increase, which could potentially open new markets (such as
farmers’ markets) for Alabama farmers. By the second year of this project, four farmers produced ethnic vegetable crops. About 55 people attended the workshop held in 2015. Additionally, the 12 farmers participating in demonstrations gained knowledge of how to produce and market a choice of specialty ethnic vegetable crops.

During year one (2015) the following activities took place: (1) Held four quarterly meetings with partners. (2) Procured seeds and supplies, and developed seedlings for use at Alabama A&M University’s Research Station and potential participating farms. (3) Surveyed multiple Alabama small farmers to assess levels of knowledge regarding ethnic vegetable production and marketing (4) Established one-acre test plot at Alabama A&M University’s Winfred Thomas Agriculture Research Station (WTARS). Five replications of Asian, Chinese, and Hispanic vegetable crops were planted and evaluated, progress and yields were documented. (5) Identified and recruited six farms to participate in trial projects whereby they choose plants and supplies provided from this project and used similar practices as Research Station. Participating farmers were required to document and share information regarding issues, progress, harvests and yields. Ended up working with three farmers: Mr. Moy, Mr. Blanks, and Mr. Booker. (6) Held one workshop/field day, 55 attended, event included site tours, guest speakers with presentations, cooking demonstration and meal with dishes using specialty vegetables. (7) Initiated six follow-up interviews with participating farmers. (8) Gathered and collected information, harvests, and yields from test plot at A&M Farm and participating farmers. (9) Graduate students compiled harvest reports from WTARS and participating farmers.

Partners for the first year of this project included:

- Urban Unit of Alabama Cooperative Extension System (ACES) at Alabama A&M University (A&M). - Mr. Robert Spencer (PI). Supported by Dr. Julio Correa (Extension Scientist), Mr. Eddie Wheeler (Extension County Coordinator), and Mr. Hunter McBrayer (Urban Extension Agent)
- Alabama A&M University - Drs. S.R. Mentreddy (Co PI & Agronomist) and James Bukenya (Co PI & Agric. Economist)
- Fayeann Crawford - A&M Graduate Student
- Radhika Kakani – Founder of Indigo Markets, Seed to Plate, and chef for 2015 workshop and field day
- Crotovina LLC- Ms. Karen Wynne, Consultant

During the first year (2015) we initially recruited 6 farmers from north to south Alabama to participate and report on harvests. They could choose their own vegetables and most chose them in the form of seedlings. After taking their seedling and supplies, three in South Alabama failed to maintain contact for reporting. So our graduate student and PI focused on working with the remaining three in North Alabama. They reported the following plants and harvests in weights and quantities.

<table>
<thead>
<tr>
<th>Farm Name</th>
<th>Owner</th>
<th>Location</th>
<th>Farm Name</th>
<th>Owner</th>
<th>Location</th>
<th>Farm Name</th>
<th>Owner</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanks Farm</td>
<td>Jerrell Blanks</td>
<td>Albertville</td>
<td>Booker Farm</td>
<td>J.D. Booker</td>
<td>Toney</td>
<td>Beacon Ranch</td>
<td>Gavin Moy</td>
<td>Douglas</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Yields in lbs.</td>
<td>Yields #</td>
<td>Vegetable</td>
<td>Yields in lbs.</td>
<td>Yields #</td>
<td>Vegetable</td>
<td>Yields in lbs.</td>
<td>Yields #</td>
</tr>
<tr>
<td>Dosakki Cucumber</td>
<td>30 lbs.</td>
<td>55</td>
<td>Mariachi Pepper</td>
<td>3 lbs.</td>
<td>Dosakki Cucumber</td>
<td>23 lbs. 2 oz.</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Bhendi Okra</td>
<td>5 lbs. 8 oz.</td>
<td></td>
<td>Ancho Pepper</td>
<td>21 lbs.</td>
<td>Bhendi Okra</td>
<td>3 lbs.</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Clemson S. Okra</td>
<td>Phuljadi Pepper</td>
<td>Bride Eggplant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 lbs. 11 oz.</td>
<td>7 lbs.</td>
<td>17 lbs. 4 oz.</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bitter Gourd</th>
<th>Dosakki Cucumber</th>
<th>Pepperoncini Pepper</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 lbs. 10 oz.</td>
<td>24 lbs.</td>
<td>5 lbs. 10 oz.</td>
<td>16</td>
</tr>
</tbody>
</table>

| Bok Choi | 21 lbs. | 35 |
| Bharta Eggplant | 32 |
| Bride Eggplant | 40 |
| Kakdi Cucumber | 80 |

*Table 1, 2015 Participating Farmer Harvests*

Mr. Blanks had a good bit of success with vegetables of his choice. Due to lack of irrigation, yields were reduced but he was satisfied with production. He marketed his vegetables at the Albertville and Huntsville farmers Markets and was satisfied with sales and prices. Mr. Moy did not have much success with production of the vegetables of his choice, He later found out the mulch he had used had herbicide in it and pretty much killed his crop. Mr. Booker had good success with vegetable production of his choice. He marketed his products at Decatur, Athens, and Huntsville Farmers Markets. He had particular success with marketing the varieties of peppers. See his comments towards end of this report.

While the farmers were busy growing and harvesting, the same endeavor was occurring on a bigger scale, on one acre at Alabama A&M University’s Winfred Thomas Agricultural Research Station (WTARS). This endeavor utilized ideal management practices, plasticulture, fish emulsion, drip irrigation, and harvesting twice a week. Five replications were established for each set of ethnic plants.

*2015 WTARS Specialty Vegetable Production (all weights in Kg)*

<table>
<thead>
<tr>
<th>Harvest Date: Merged Harvest Data May-Sept. 2015 on One Acre</th>
<th>Combined Reps &amp; Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hispanic</strong> Peppers</td>
<td>Habanero Pepper</td>
</tr>
<tr>
<td>Weight kg.</td>
<td>2.11</td>
</tr>
<tr>
<td>Weight lbs.</td>
<td>4.642</td>
</tr>
<tr>
<td><strong>Chinese</strong> Herbs</td>
<td>Lemon Hoary Basil</td>
</tr>
<tr>
<td>Weight lbs.</td>
<td>31.878</td>
</tr>
<tr>
<td><strong>Indian</strong> Vegetables</td>
<td>Lebanese Zuchinni</td>
</tr>
<tr>
<td>Weight kg.</td>
<td>127.27</td>
</tr>
<tr>
<td>Weight lbs.</td>
<td>279.994</td>
</tr>
</tbody>
</table>
## Table 2, 2015 Winfred Thomas Agricultural Research Station Harvest Data on One Acre

<table>
<thead>
<tr>
<th>Trellis Rows (4 rows)</th>
<th>Hyancinth Bean</th>
<th>Bottle Gourd</th>
<th>Ridge Gourd</th>
<th>Wax Gourd</th>
<th>Kakadi Cucumber</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Row 1</strong></td>
<td>kg.</td>
<td>lbs.</td>
<td>kg.</td>
<td>lbs.</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>2.97</td>
<td>96.04</td>
<td>36.17</td>
<td>272.03</td>
<td>56.08</td>
</tr>
<tr>
<td><strong>Row 2</strong></td>
<td>kg.</td>
<td>lbs.</td>
<td>kg.</td>
<td>lbs.</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>106.36</td>
<td>233.992</td>
<td>40.99</td>
<td>90.178</td>
<td>63.91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dosakki Cucumber</th>
<th>Bitter Gourd</th>
<th>Malbar Spinach</th>
<th>Ash Gourd</th>
<th>Bird House Gourd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong></td>
<td>kg.</td>
<td>lbs.</td>
<td>kg.</td>
<td>lbs.</td>
</tr>
<tr>
<td>Weight</td>
<td>6.534</td>
<td>211.288</td>
<td>79.574</td>
<td>598.466</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>106.36</td>
<td>233.992</td>
<td>40.99</td>
<td>90.178</td>
</tr>
</tbody>
</table>

During year two, the following activities were accomplished: (1) Two quarterly meeting with partners. (2) Procured seeds and supplies, and developed seedlings for use at Alabama A&M University’s Research Station and potential participating farms. (3) Utilized a 1/8-acre test plot at Alabama A&M University’s Winfred Thomas Agriculture Research Station. Five replications of Asian, Indian, and Hispanic vegetable crops established. Scaled back to make harvests more manageable. (4) Tracked and documented, issues and yields. (5) Identified and recruited three farms, Mr. DeBoer, Mr. Powell, and Mr. Booker to participate in trial projects whereby they choose seeds to be provided from this project and used similar practices as Research Station. Participating farmers were required to document and share information regarding production, issues, harvests and yields. (6) Held one training of the trainers’ workshop/field day in September, 23 attended, event included site tours, guest speakers and presentations. (7) Initiated four follow-up interviews with participating farmers. (8) Gathered and collected information, harvests, and yields from test plot at A&M Farm and participating farmers.

As can be seen from the previous three tables organic production of specialty vegetables is feasible and with many varieties. And based on feedback obtained from farmers they saw the potential for viable markets.

Partners for the second year of this project included:
- Urban Unit of Alabama Cooperative Extension System (ACES) at Alabama A&M University (A&M). - Mr. Robert Spencer (PI). Supported by Dr. Julio Correa (Extension Scientist), Mr. Eddie Wheeler (Extension County Coordinator), and Mr. Hunter McBrayer (Urban Extension Agent)
- Alabama A&M University - Drs. S.R. Mentreddy (Co PI & Agronomist) and James Bukenya (Co PI & Agric. Economist)
- Fayeann Crawford - A&M Graduate Student
- Lewis Bingham – A&M Research Assistant
- Dr. Ernest Cebert – Interim Research Director, Winfred Thomas Agriculture Research Station, Alabama A&M University

Due to logistics and previous year’s attempt at working with farmers in South Alabama it was decided to focus on working with four farmers in North Alabama. About half way through the summer three farmers had dropped out of the project. Herbicide drift from a neighbor’s property kill Mr. Booker’s plants. Mr. DeBoer failed to control the weeds and they overtook his site. And Mr. Powell did not have adequate irrigation or mulch, and most of his plants were affected by a drought, and therefore produced poor yields. However, he sold peppers at a local farmers’ market in Decatur and Cullman, but did not document yields or sale prices.
There was one farmer, Dan Shultz, in Jackson County who was somewhat successful. He came to us in early summer after reading about the project and wanted to try growing quite a few of the vegetables from seed. He chose both varieties of Bell Pepper, Bhaji Pepper, Chilli Pepper, Malabar Spinach, Thai Basil, Dosakaya Cucumber, Barantha Eggplant, Sorrell (Roselle), Ridge Gourd, Thai Round Purple Eggplant, Bendi Okra, and Bitter Gourd. As you will see from his comments he encountered a few problems, much of which can be attributed to insufficient management. Given he is new to farming he was not shy about making a valiant effort. His comments were: “Overall success of the garden was 50%, there were some issues with germination, inadequate provision of water, and weed encroachment. This project was valuable to me because I did achieve a working knowledge of these specialty vegetables”. While he did not document yields, yet he did say the okra was most prolific, the bottle gourd was delicious when cooked, and he had a friend who enjoyed the bitter gourd. His final comment was: “These plants are not suited for commercial production unless someone is willing to make an investment in trellis and irrigation”.

During the same period an endeavor on one-eighth of an acre was taking place at Alabama A&M University’s Winfred Thomas Agricultural Research Station and the following yields were documented while harvesting two times a week. Please keep in mind when evaluating the two WTARS projects the first year utilized one acre and year two utilized one-eighth an acre. Five replications were established for each set of ethnic plants.

<table>
<thead>
<tr>
<th>2016 WTARS Specialty Vegetable Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest Date: Merged Harvest Data May-Sept. 2016 on 1/8 Acre</td>
</tr>
<tr>
<td><strong>All Reps &amp; Rows</strong></td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
</tr>
<tr>
<td>Habanero Pepper</td>
</tr>
<tr>
<td>Weight kg. 12.84</td>
</tr>
<tr>
<td>Weight lbs. 28.25</td>
</tr>
<tr>
<td>Quantity 1773</td>
</tr>
<tr>
<td>Cayenne Pepper</td>
</tr>
<tr>
<td>Weight kg. 7.28</td>
</tr>
<tr>
<td>Weight lbs. 16.02</td>
</tr>
<tr>
<td>Quantity 1663</td>
</tr>
<tr>
<td>Mariachi Pepper</td>
</tr>
<tr>
<td>Weight kg. 49.52</td>
</tr>
<tr>
<td>Weight lbs. 108.94</td>
</tr>
<tr>
<td>Quantity 1938</td>
</tr>
<tr>
<td>Pepperon. Pepper</td>
</tr>
<tr>
<td>Weight kg. 19.43</td>
</tr>
<tr>
<td>Weight lbs. 42.75</td>
</tr>
<tr>
<td>Quantity 2223</td>
</tr>
<tr>
<td>Poblano Pepper</td>
</tr>
<tr>
<td>Weight kg. 11.27</td>
</tr>
<tr>
<td>Weight lbs. 24.79</td>
</tr>
<tr>
<td>Quantity 375</td>
</tr>
<tr>
<td><strong>Chinese</strong></td>
</tr>
<tr>
<td>Lemon Basil</td>
</tr>
<tr>
<td>Weight kg. 31.26</td>
</tr>
<tr>
<td>Weight lbs. 68.76</td>
</tr>
<tr>
<td>Quantity 300</td>
</tr>
<tr>
<td>Thai Basil</td>
</tr>
<tr>
<td>Weight kg. 21.38</td>
</tr>
<tr>
<td>Weight lbs. 47.03</td>
</tr>
<tr>
<td>Quantity 3313</td>
</tr>
<tr>
<td>Rnd. Purple Eggplant</td>
</tr>
<tr>
<td>Weight kg. 53.15</td>
</tr>
<tr>
<td>Weight lbs. 116.92</td>
</tr>
<tr>
<td>Quantity 1047</td>
</tr>
<tr>
<td>Clemson Okra</td>
</tr>
<tr>
<td>Weight kg. 76.92</td>
</tr>
<tr>
<td>Weight lbs. 169.22</td>
</tr>
<tr>
<td>Bride Eggplant</td>
</tr>
<tr>
<td>Weight kg. 62.55</td>
</tr>
<tr>
<td>Weight lbs. 137.60</td>
</tr>
<tr>
<td>Indian</td>
</tr>
<tr>
<td>Red Basil</td>
</tr>
<tr>
<td>Weight kg. 6.13</td>
</tr>
<tr>
<td>Weight lbs. 13.48</td>
</tr>
<tr>
<td>Quantity 603</td>
</tr>
<tr>
<td>Baratha Eggplant</td>
</tr>
<tr>
<td>Weight kg. 152.77</td>
</tr>
<tr>
<td>Weight lbs. 336.08</td>
</tr>
<tr>
<td>Quantity 1556</td>
</tr>
<tr>
<td>Bendi Okra</td>
</tr>
<tr>
<td>Weight kg. 32.69</td>
</tr>
<tr>
<td>Weight lbs. 71.92</td>
</tr>
<tr>
<td>Quantity 255</td>
</tr>
<tr>
<td>Sorrell</td>
</tr>
<tr>
<td>Weight kg. 45.36</td>
</tr>
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<td>Weight lbs. 99.79</td>
</tr>
<tr>
<td>Bell Pepper</td>
</tr>
<tr>
<td>Weight kg. 24.64</td>
</tr>
<tr>
<td>Weight lbs. 54.21</td>
</tr>
<tr>
<td>Quantity 255</td>
</tr>
</tbody>
</table>
Table 3. 2016 Winfred Thomas Agricultural Research Station Harvest Data on 1/8 Acre

<table>
<thead>
<tr>
<th>Row 1</th>
<th>Trellis Rows (2 rows)</th>
<th>Hyacinth Bean</th>
<th>Bottle Gourd</th>
<th>Ridge Gourd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight kg.</td>
<td>7.51</td>
<td>31.77</td>
<td>56.17</td>
<td></td>
</tr>
<tr>
<td>Weight lbs.</td>
<td>16.51</td>
<td>69.88</td>
<td>123.58</td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>61</td>
<td>269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Row 2</td>
<td>Dosakki Cucumber</td>
<td>Bitter Gourd</td>
<td>Malbar Spinach</td>
<td></td>
</tr>
<tr>
<td>Weight kg.</td>
<td>59.24</td>
<td>39.98</td>
<td>31.59</td>
<td></td>
</tr>
<tr>
<td>Weight lbs.</td>
<td>130.32</td>
<td>87.96</td>
<td>69.49</td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>222</td>
<td>510</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Determining production cost for specialty vegetable production depends on resources, management capabilities, and commitment. Based on best management practices at WTARS there are higher input costs and better yields. Problems observed with the participating farmers included: Choosing not to use mulch or plasticulture and irrigation which would have retained moisture and prevented weed encroachment. These are all management issues, and these same farmers had visited the WTARS site and saw what we recommended. Ironically, while failure to implement these practices reduced costs, it also reduced both, yields and quality of the produce. And yes there was the unfortunate incident with herbicide drift. The production cost document in this report is based on ideal management practices utilized at WTARS.

### ESTIMATED ANNUAL OPERATIONAL PRODUCTION COST BUDGET:
**Specialty Vegetable Production (1 Acre)**

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Item</th>
<th>Qty.</th>
<th>Unit</th>
<th>Price/Unit</th>
<th>Subtotals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land Preparation &amp; Equip.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Tractor</td>
<td>1</td>
<td>8 Hours*$20/hour</td>
<td>$160</td>
<td>$160</td>
</tr>
<tr>
<td>B</td>
<td>Rotary Tiller</td>
<td>1</td>
<td>8 Hours*$15</td>
<td>$120</td>
<td>$120</td>
</tr>
<tr>
<td>C</td>
<td>Plasticulture Mulch Layer</td>
<td>1</td>
<td>4 hours*$10</td>
<td>$40</td>
<td>$40</td>
</tr>
<tr>
<td>D</td>
<td>Labor Man Hours (spring &amp; fall)</td>
<td>26</td>
<td>Hours</td>
<td>$12</td>
<td>$312</td>
</tr>
<tr>
<td>2</td>
<td>Soil Amendments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Potting Mix</td>
<td>90</td>
<td>3.8 Cu. Ft.</td>
<td>$30</td>
<td>$2,700</td>
</tr>
<tr>
<td>B</td>
<td>Wheelbarrow</td>
<td>2</td>
<td>Depreciation</td>
<td>$62</td>
<td>$124</td>
</tr>
<tr>
<td>3</td>
<td>Seeds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Various</td>
<td>1</td>
<td>oz.-1/4 lb.</td>
<td>$675</td>
<td>$675</td>
</tr>
<tr>
<td>4</td>
<td>Fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Fish emulsion (2 apps/yr.)</td>
<td>2</td>
<td>55 gal. drums</td>
<td>$550</td>
<td>$1,100</td>
</tr>
<tr>
<td>B</td>
<td>Poultry Litter</td>
<td>180</td>
<td>50 lb. bags</td>
<td>$7</td>
<td>$1,258</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Labor Man Hours</td>
<td>24</td>
<td>Hours</td>
<td>$12</td>
<td>$288</td>
</tr>
<tr>
<td>5</td>
<td>Irrigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Driplines &amp; connector kits</td>
<td>5</td>
<td>Kit (16,000 ft.)</td>
<td>$75</td>
<td>$375</td>
</tr>
<tr>
<td>B</td>
<td>Irrigation Lines</td>
<td>18</td>
<td>12,000 ft.</td>
<td>$27</td>
<td>$486</td>
</tr>
<tr>
<td>C</td>
<td>Rolls of Black Plastic</td>
<td>23</td>
<td>Rolls (16,000 ft.)</td>
<td>$45</td>
<td>$1,035</td>
</tr>
<tr>
<td>D</td>
<td>Labor Man Hours</td>
<td>18</td>
<td>Hours</td>
<td>$12</td>
<td>$216</td>
</tr>
<tr>
<td>6</td>
<td>Seed Establishment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Propagation trays</td>
<td>2</td>
<td>Boxes</td>
<td>$42</td>
<td>$84</td>
</tr>
<tr>
<td>B</td>
<td>Labor Man Hours</td>
<td>9</td>
<td>Hours</td>
<td>$12</td>
<td>$108</td>
</tr>
<tr>
<td>7</td>
<td>Planting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Planting tools</td>
<td>3</td>
<td>Unit</td>
<td>$12</td>
<td>$36</td>
</tr>
<tr>
<td>B</td>
<td>Labor Man Hours</td>
<td>18</td>
<td>Hours</td>
<td>$12</td>
<td>$216</td>
</tr>
<tr>
<td>8</td>
<td>Weeding &amp; Mowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Weedeater &amp; Mower</td>
<td>1</td>
<td>Depreciation</td>
<td>$52</td>
<td>$52</td>
</tr>
<tr>
<td>B</td>
<td>Labor Man Hours</td>
<td>240</td>
<td>Hours</td>
<td>$12</td>
<td>$2,880</td>
</tr>
<tr>
<td>9</td>
<td>Parasite &amp; Disease Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Sprayer</td>
<td>1</td>
<td>$18/ Hour*$10/hour</td>
<td>$180</td>
<td>$180</td>
</tr>
<tr>
<td>B</td>
<td>Insecticide</td>
<td>1</td>
<td>5 gallons</td>
<td>$243</td>
<td>$243</td>
</tr>
<tr>
<td>C</td>
<td>Labor Man Hours</td>
<td>18</td>
<td>Hours</td>
<td>$12</td>
<td>$216</td>
</tr>
<tr>
<td>10</td>
<td>Harvesting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Harvesting Shears</td>
<td>2</td>
<td>Sets</td>
<td>$18</td>
<td>$36</td>
</tr>
<tr>
<td>B</td>
<td>5 Gallon Buckets</td>
<td>28</td>
<td>Each</td>
<td>$1</td>
<td>$28</td>
</tr>
<tr>
<td>C</td>
<td>Labor Man Hours</td>
<td>988</td>
<td>Hours</td>
<td>$12</td>
<td>$11,856</td>
</tr>
<tr>
<td>11</td>
<td>Separate, Weigh &amp; Wash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Equipment (electric scales)</td>
<td>1</td>
<td>Depreciation</td>
<td>$50</td>
<td>$50</td>
</tr>
<tr>
<td>B</td>
<td>Labor</td>
<td>494</td>
<td>Hours</td>
<td>$12</td>
<td>$5,928</td>
</tr>
<tr>
<td>12</td>
<td>Hauling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Pick-up Truck</td>
<td>1</td>
<td>Depreciation</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>B</td>
<td>Labor Man Hours</td>
<td>88</td>
<td>Hours</td>
<td>$12</td>
<td>$1,056</td>
</tr>
<tr>
<td>13</td>
<td>Fuel &amp; Utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Diesel</td>
<td>15</td>
<td>Gallons</td>
<td>$3</td>
<td>$38</td>
</tr>
<tr>
<td>B</td>
<td>Gasoline</td>
<td>30</td>
<td>Gallons</td>
<td>$2</td>
<td>$63</td>
</tr>
<tr>
<td>C</td>
<td>Water</td>
<td>Gallons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Repair &amp; Maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Parts</td>
<td>10</td>
<td>Item</td>
<td>$30</td>
<td>$300</td>
</tr>
<tr>
<td>B</td>
<td>Labor Man Hours</td>
<td>12</td>
<td>Hours</td>
<td>$12</td>
<td>$144</td>
</tr>
<tr>
<td>15</td>
<td>Interest on Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Misc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Tote &amp; paper bags, water hoses</td>
<td>1</td>
<td></td>
<td>$300</td>
<td>$300</td>
</tr>
<tr>
<td>18</td>
<td>Total Annual Costs of Production</td>
<td>$33,703</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 4. Cost of Production on 1 acre utilizing ideal management practices*
Marketing any of these specialty vegetables requires quality product, sufficient quantity to meet demand, consistency with supply, and a grasp of value addition. Based on our research the demand/opportunity comes from ethnic restaurants and stores, farmers’ markets, and vendors interested in doing value-added breads, jellies, and pickles using the various peppers, gourds, and melons. Ethnic clientele includes consumers from southeast Asia, Africa, Caribbean Basin, and Central America. Ethnic restaurants and specialty stores prefer to buy local and fresh but need quality, quantity, and consistency or else they will return to relying on commercial distributors. We experienced interest in peppers and some gourds or melons for pepper jelly, pickles, and spicy breads but they only needed small quantities. There is a strong interest in all products at farmers’ markets and stores where various ethnicities shop and expect to return a few weeks later for more products. Restaurant owners expect quality and volume. Prices vary depending on quantity and quality and whether product is being sold wholesale or retail. Marketing opportunities for these specialty vegetables are more likely to exist in larger cities and especially larger cities where multiple universities exist. The reason this situation is ideal for marketing is many of these universities will employ staff and faculty with ethnic backgrounds who are familiar with and will actively seek out these vegetables at specialty markets, farmers markets, and grocery stores offering specialty vegetables.

Marketing prices at various locations were as follows:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitter melon</td>
<td>5.92</td>
</tr>
<tr>
<td>Bhendi or Clemson Okra</td>
<td>6.58</td>
</tr>
<tr>
<td>Indian chill peppers long</td>
<td>8.78</td>
</tr>
<tr>
<td>Habenaro/hispanic peppers</td>
<td>10.98</td>
</tr>
<tr>
<td>Eggplant- Indian</td>
<td>4.38</td>
</tr>
<tr>
<td>Eggplant- Chinese</td>
<td>3.28</td>
</tr>
<tr>
<td>Dosakaya cucumber</td>
<td>6.58</td>
</tr>
<tr>
<td>Ash gourd/winter gourd</td>
<td>5.26</td>
</tr>
<tr>
<td>Bottle gourd</td>
<td>2.18</td>
</tr>
<tr>
<td>Snake gourd</td>
<td>6.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitter melon</td>
<td>5.92</td>
</tr>
<tr>
<td>Bhendi or Clemson Okra</td>
<td>6.58</td>
</tr>
<tr>
<td>Chilli peppers, long</td>
<td>8.78</td>
</tr>
<tr>
<td>Thai chilli pepper</td>
<td>10.98</td>
</tr>
<tr>
<td>Eggplant- Indian</td>
<td>4.38</td>
</tr>
<tr>
<td>Eggplant- Chinese</td>
<td>3.28</td>
</tr>
<tr>
<td>Dosaki cucumber</td>
<td>6.58</td>
</tr>
<tr>
<td>Winter/Ash gourd/melon</td>
<td>5.26</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>2.84</td>
</tr>
<tr>
<td>Snake gourd</td>
<td>6.58</td>
</tr>
</tbody>
</table>

Table 5. Specialty Vegetable prices found at two local stores in Huntsville
There are certain aspects of this project that were successful and some that need revising or improved management. Overall the project was successful. Based on feedback from participating farmers selling product there is a strong demand and they can obtain good prices. Cost of production is a factor but if managed correctly (irrigation and plasticulture or mulch) the plants will be prolific and disease issues minimal. Disease only tended to be a problem in situations where vine crops were planted too close together and insufficient sunlight and perhaps, excess humidity among the plants provided conducive environment for disease complications. Insect infestations were rarely a problem, mainly Japanese Beetles or Stinkbugs, and were easily dealt with using an organic insecticide. Marketing/demand seemed probably one of the easiest aspects of specialty vegetable production. There are opportunities for market diversification and strong interest in product. And a little bit of consumer education (recipes and tastings) would help with promotion and sales to nontraditional consumers. A knowledge and promotion of the health value and value-added opportunities would also help with marketing.

Significant contributions and role of project partners were as follows. Production and management – Dr. S.R. Mentreddy, Mr. Robert Spencer, and Mr. Lewis Bingham. Harvesting and data collection - Mr. Lewis Bingham, Mr. Robert Spencer and Ms. Fayeanne Crawford. Event promotion - Dr. Julio Correa, Mr. Eddie Wheeler (Extension County Coordinator), Mr. Hunter McBrayer, and Ms. Karen Wynne. Chef for first outreach event - Radhika Kakani. Economic advisor – Dr. James Bukenya. WTARS support team - Dr. Ernest Cebert and staff.

**Goals and Outcomes Achieved**

The goal of this two-year project was to develop a complete package of production costs, current and potential markets, and marketing strategies for ethnic vegetable crops grown by limited resource and small farm owners in Alabama. Vegetable types in this project will include Asian, Indian, and Hispanic. The project utilizes a demonstration site, field days, and recruit farmers to participate and report their experiences.

**Specific goals:**
- Hold planning meetings with partners
- Utilize a demonstration site at Alabama A&M University’s Winfred Thomas Agricultural Research Station for two years that promotes ideal production and management for a variety of specialty/ethnic crops
- Recruit a maximum of six farmers each year to grow and market organic specialty vegetables of their choice and report their experiences
- Utilize annual workshop/field days or training-of-the-trainers event promoting organic vegetable production over two years with a combined total of 88 attendees
- Develop a package that includes production costs, marketing opportunities and strategies

**Specific outcomes:**
- Held six planning meetings with partners
- With the use of WTARS demonstration site utilized five replications each year and produced twenty-nine varieties of organic vegetables the first year and twenty-two varieties of organic vegetables the second year. This site utilized ideal management practices that included plasticulture and drip irrigation for all crops, and trellises for vine crops.
- Recruited six farmers across State the first year and ended up working with three farmers. Recruited and worked with four farmers in North Alabama the second year.
- Held one workshop/field day the first year with fifty-five attendees. Second year held one workshop/field day/training-of-the-trainers the second year with twenty-three attendees. Each
event included an evaluation component that surveyed gain in knowledge, intent to implement, and potential for increasing farm revenues from marketing specialty vegetables.

- Developed a production cost sheet and fact sheet on specialty vegetable production. Researched marketing opportunities that include farmers’ markets, specialty/ethnic stores, and ethnic restaurants. Based on inquiries with three marketing opportunities they all prefer local, fresh, organic, quality products over products transported long-distances or imported.

One student graduated with an MS in Plant and Soil Science degree based on research on ethnic vegetable crops.

A major outcome of this project is evidence for production and marketing opportunities of specialty or ethnic vegetable crops for Alabama farmers. The participating farmers proved production and marketing could be accomplished, and the demonstration site at WTARS proved with ideal management practices organic production would be prolific. Based on costs at the WTARS site a cost sheet was developed, and a fact sheet is in the stages of being edited and formatted. Workshops/field days were held each year with a total or seventy-eight attendees (target was 88). Marketing opportunities and some basic ideas on prices were identified at farmers’ markets, specialty stores, and ethnic restaurants. Conclusion could be made that opportunities for organic production and marketing of specialty vegetables does exist.

Beneficiaries
Seventy-Eight attendees of the two workshops/field days benefited from the lectures and site visits. Several of the attendees from year two worked for Alabama Cooperative Extension System and were going to take the information back to specific clients in their area who had an interest in production and marketing; the specific cities they were going to target was Birmingham, and Mobile. Groups that benefited by attending these outreach events were associated with the Alabama Sustainable Agriculture Network. Others benefitting included the seven participating farmers who attended outreach events, receive specified seeds and experienced production, management, and marketing opportunities. Without this project eighty-four people would not have learned about specialty vegetables, nor had the culinary experience during the first workshop, or seen the crops in production at WTARS, and learned about production, management, and marketing of specialty vegetables.

Post event evaluations provided quantitative data regarding outcomes of two workshops/field day events: 2015-2016

<table>
<thead>
<tr>
<th>Madison County Specialty Vegetable Workshop 2015</th>
<th>Yes 88%</th>
<th>No 12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you currently grow fruits or vegetables on your farm for resale?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Are you interested in learning more about opportunities for growing and marketing specialty vegetables for ethnic minority immigrant populations?</td>
<td>Yes 71%</td>
<td>Maybe 29%</td>
</tr>
<tr>
<td>3. Did the session on project overview help you better understand types of vegetables being grown, justification for growing them, and opportunities that might be available through production and direct marketing or farmers’ markets?</td>
<td>Yes 82%</td>
<td>Some What 18%</td>
</tr>
<tr>
<td>4. Did this session inspire you to consider growing these products on your farm?</td>
<td>Yes 59%</td>
<td>Maybe 24%</td>
</tr>
<tr>
<td>5. Did the vegetable and herb tour give you a better understanding of specialty produce and how easily it can be grown?</td>
<td>Yes 76%</td>
<td>Some What 6%</td>
</tr>
<tr>
<td>6. Are you likely to apply this type of specialty production to your farm?</td>
<td>Yes 53%</td>
<td>Maybe 41%</td>
</tr>
</tbody>
</table>
7. Did the cooking and culinary session give you better idea about how to prepare these various vegetables and herbs? | Yes | Some | No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>88%</td>
<td>12%</td>
<td>0%</td>
</tr>
</tbody>
</table>

8. After seeing how easily they are prepared, it this something you would try at home? | Yes | Maybe | No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>82%</td>
<td>18%</td>
<td>14%</td>
</tr>
</tbody>
</table>

9. Do you believe what you learned today will provide opportunities to expand production on your farm and market these new products? | Yes | Maybe | No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>71%</td>
<td>18%</td>
<td>11%</td>
</tr>
</tbody>
</table>

10. Do you feel applying what was learned today will help increase the likelihood for sustainability and possible profitability on your farm in the long-run? | Yes | Maybe | No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>76%</td>
<td>18%</td>
<td>6%</td>
</tr>
</tbody>
</table>

11. If you produce vegetables for resale, do you currently utilize direct marketing from your farm, farmers’ markets? | Yes | Maybe | Non |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>38%</td>
<td>24%</td>
<td>24%</td>
</tr>
</tbody>
</table>

12. If you produce vegetables for resale, would you be interested in wholesaling them to some type of store? | Yes | Maybe | No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>82%</td>
<td>10%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 7. Post event evaluation 2015

| Specialty Vegetable Production & Marketing Field Day: Training of the Trainers 2016 |
|-----------------|---|---|---|
| 1. Is this your first time to attend an Extension or A&M workshop? | Yes | 14% | No | 86% |
| 2. Rate your knowledge of IPM tactics prior to this event: | Low | Med. | High |
|-----|------|-----|
| 36%| 50% | 14% |
| 3. Rate your knowledge of IPM tactics after this event: | 14%| 21% | 64% |
| 3. Rate your knowledge of cover crops and soil improvement prior this event: | 36%| 57% | 7% |
| 4. Rate your knowledge of cover crops and soil improvement after this event: | 21%| 29% | 50% |
| 5. Rate your knowledge of varieties of specialty vegetables prior to this event: | 36%| 57% | 7% |
| 6. Rate your knowledge of varieties of specialty vegetables after this event: | 0%| 36% | 64% |
| 7. Rate your knowledge of marketing specialty vegetables prior to this event: | 21%| 36% | 43% |
| 8. Rate your knowledge of marketing specialty vegetables after this event: | 7%| 36% | 57% |
| 9. From what you have learned today will you be able to teach other farmers? | Yes | Maybe | No |
|-----|------|-----|
| 64%| 29% | 7% |
| 10. Do you currently grow specialty vegetables such as you saw today? | 29%| 71% |
| 11. If you said no, will you begin production in the near future? | 57%| 43% |
| 12. If you said yes, will you expand production? | 21%| 7% |
| 13. Would you recommend this type of event to others with similar interest? | 100%|
| 14. Do you market your specialty vegetables? | 21%| 7% |
|-----|------|-----|-----|
| 21%| 14% | 7% |
| 16. How long have you been marketing specialty vegetables? 3 said 1-3 years, 1 said 4-5 years |
| 17. Which vegetables do you have the most success marketing? 2 - peppers, 1 - eggplant, 2 - leafy vegetables, 1 - okra, 4 - herbs |
Lessons Learned
Overall the project was an interesting learning experience for workshop attendees and project staff. People were interested to learn about these vegetables, their culinary and health appeal, and about marketing opportunities. When best management practices (irrigation and plasticulture or mulch) are implemented harvests are increased and there are very limited problems with weeks. The staff, volunteer harvesters (about two each year), and general public enjoyed sharing and consuming these specialty vegetables. Many of the vegetables were given away and divided among a local temple. People there really appreciated receiving the vegetables they were familiar with from India. Based on this experience I say specialty vegetable production and marketing is viable for farmers willing to put forth the effort, it does require work, dedication, and pursuit of marketing to be viable.

Unusual developments during this project included a significant number of farmers who expressed a strong interest to participate in the project and once they had product that is the last we would hear from them, no return on phone calls or e-mails. Distance and difficulty to work closely with some farmers may have been the cause for failed collaborations. Choosing farmers in close proximity enabled more frequent farm visits and control of situations. Then there were poor management issues with other farmers who failed to utilize irrigation, weed control, and plasticulture or mulch. The farmers recognized these problems but chose not to implement these practices. In situation such as at WTARS there was always someone to properly manage the project for both years so minimal problems were experienced.

The other aspect of these workshops/field-days that might increase attendance is to include a component that offers organic certification or credits for those with an interest. While it would extend the time span of these events it would encourage additional attendance.

Even in the best of conditions at WTARS the staff had the following challenges and used them as learning experiences to identify and implement opportunities for improvement.

Learning opportunities for year one:
• Trying to implement this project across the State was overwhelming
• A prolific, one-acre garden can be difficult to manage with three people on a part-time basis

Learning opportunities for year two
• Working with farmers in close proximity to project site is more manageable
• Scaling-back site at WTARS was more practical

Overall learning opportunities:
• Relying on participants to cooperate with implementation and reporting requires stringent follow-through
• Always expect the unexpected
• There will be minor insect (Japanese Beetles & Stink Bugs) and disease problems (fungus and virus)

Unexpected outcomes would be failure for dropout rate of first year participants. Given this project delivered all promised supplies I do not feel this was our fault. The distanced from one end of the state to other may have been a factor as well as the fact we could not be with participants as often as needed. However, e-mails and phone calls to see how we could help went unreturned.

The following interview at the end of 2015 with Mr. Booker provided us with a great amount of insight. It was a shame herbicide drift from a neighbor’s property wiped out his 2016 specialty vegetable crops.
End of Summer Interview for 2015 Ethnic Vegetable Project with Mr. J.D. Booker, September 3, 2015

Bitter gourd
- Big seller
- Needs trellis
- Matures fast
- Had one buyer who wanted 80
- Smaller sells quicker
- Asian buyers want it bigger

Bok Choi
- Died very soon after planting
- Bugs and heat seemed to quickly kill it

Ashwaganda
- Very prolific,
- Have not tried to sell it, did not know features to market

Peppers
- Very prolific,
- Good sellers
- 3 harvests
- Sell for $3/cup

Thai Basil
- Does very well
- Have not tried to sell, has big demand, will try and market aggressively
- Have big demand for bundles, will start selling next week (early Sept.)
- Plan to sell $4-$5/bundle

Dosaki
- Did real good most of summer, still doing good
- If allowed to over ripen it does not sell
- Buyers want it flawless
- Being on low end of garden moisture tended to cause problems

Egg plant
- Bugs were a problem at first, sprayed with organic insecticide
- Good sellers
- Buyers did not want big ones, they did not sell

Bottle Gourd
- Did well throughout summer, still doing good
- Buyers want bigger size

Sorrell
- Plants struggled at first, doing okay now
- Have not tried to market, may be limited demand

Markets
- Cook Ave. (Madison County) on Fridays and Saturdays
- Athens (Limestone Co.) on Tuesdays, this market is turning out to be a good market
- Decatur (Morgan County) was not too good, ended up going with Athens
- He offers u-pick, custom order where customer picks up order
- Takes lots of preorders and small bulk orders
- Offers home and store delivery
- Delivers to Korean grocery store
- Been talking to other potential ethnic stores and restaurants
- Very proactive in seeking out markets
- Explores various farmers’ markets to see which offer greatest potential
- Plans to advertise on Alabama Market Maker
Overall

- Ongoing problems with ethnic vegetables and excess moisture in low end of garden (entire garden is on sloping hill), his hill side contoured ridges
- Minor disease and pest issues, used organic pesticide on few things
- Overall production and marketing good
- This year he expects to cover operating cost, next year he hopes to be profitable

Given this years’ experience has been predominantly positive, he would participate next year

**Project Contact Person**
Robert Spencer, PI
256-372-4983
ds0002@aces.edu

**ADENDUMS**

**Success Story 2015: Ethnic Vegetable Crops Workshop: A Collaborative Success Between Alabama A&M University and Alabama Cooperative Extension System**

The event took place at Alabama A&M University’s Winfred Thomas Agricultural Research Station in Hazel Green, AL. Date was Saturday August 29, 2015, event occurred from 8:00 AM to 5:00 PM. The venue was provided in-kind, both the meeting room and ½ acre research garden plot. The goal was to educate potential and existing producers on fundamental aspects/opportunities with production, management, and marketing of ethnic vegetables. Strategy was to use a combination of research site, classroom lecture, and producer panel discussion. The fifty-five attendees came from North and central Alabama, Alabama A&M University, Alabama Cooperative Extension System, Alabama Department of Agriculture and Industries, Auburn University, Fort Valley State University (GA), Mississippi State University (MS), and Tennessee State University (TN).

**Attendees included:**

- A fifty/fifty mix of academic and State personnel, and potential and existing producers
- 46 Adult, 9 Youth
- 26 Female, 29 Male
- 5 American Indian, 12 Asian, 25 Black, 11 White, 2 Other

**Topics, Speakers, and Represented Agencies**

- **Comments & Welcome**
  - Ms. Laura Hall, District 1 Alabama House of Representatives
  - Mr. Terry Martin, Alabama Department of Agriculture and Industry
  - Dr. Lloyd Walker, Dean, Alabama A&M University, College of Agricultural, Life, and Natural Sciences
  - Dr. Anthony Overton, Chairperson, Department of Biological and Environmental Sciences (AAMU/CALNS)
- **Moderators:** Dr. Julio Correa, Ms. Karen Wynne, Mr. Hunter McBrayer, Mr. Robert Spencer
- **Tour and discussion of research plot, Demonstration**
  - Dr. S. Rao Mentreddy, Professor, AAMU
  - Mr. Robert Spencer, Specialist, ACES
  - “Micro-irrigation Set-up and Maintenance” Mr. Arnold Caylor, Manager, North Alabama Horticulture Research Station
- **Cooking demonstration**
  - Ms. Radhika Kakani, Chef, Indigo Market, LLC
- **Lectures**
- “Production and Management of Ethnic Vegetable Crops”, William Evans, Associate Research Professor, Mississippi State University
- “Ethnic/Specialty Vegetable Crops Production Practices in Alabama”, Arnold Caylor

- Panel Discussion
  - Mrs. Marguerite McClintock, Producer
  - Mrs. Barbara Shipman, Producer
  - Mr. J.D. Booker, Producer

### Comparison of Participants' Knowledge Before and After Training

<table>
<thead>
<tr>
<th>Topic</th>
<th>Pre-Test Mean</th>
<th>Post-Test Mean</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic Vegetable Varieties</td>
<td>2.0</td>
<td>3.68</td>
<td>1.68</td>
</tr>
<tr>
<td>Production of Ethnic Vegetables</td>
<td>1.89</td>
<td>3.68</td>
<td>1.79</td>
</tr>
<tr>
<td>Management of Ethnic Vegetable Crops</td>
<td>1.64</td>
<td>3.71</td>
<td>2.07</td>
</tr>
<tr>
<td>Integrated Pest Management of...</td>
<td>1.71</td>
<td>3.54</td>
<td>1.83</td>
</tr>
<tr>
<td>Micro-irrigation Set-up &amp; Maintenance</td>
<td>1.79</td>
<td>3.57</td>
<td>1.78</td>
</tr>
<tr>
<td>Production and Marketing...</td>
<td>1.96</td>
<td>3.68</td>
<td>1.72</td>
</tr>
<tr>
<td>Cooking of Ethnic Vegetables</td>
<td>2.18</td>
<td>3.75</td>
<td>1.57</td>
</tr>
</tbody>
</table>

Mean of Knowledge Rating (1=Very Low; 5=Very High)

### Impact of the Training in Building Participants' Knowledge

- Ethnic Vegetable Varieites: 89%
- Production of Ethnic Vegetables: 96%
- Management of Ethnic Vegetable Crops: 96%
- Integrated Pest Management of Vegetables: 93%
- Micro-irrigation Set-up & Maintenance: 89%
- Production and Marketing Opportunities of Ethnic...: 89%
- Cooking of Ethnic Vegetables: 89%

Percentage of the Participants Who Improved Their Knowledge
Satisfaction. How satisfied are you with:
- Topics & discussion: 54% Satisfied, 46% Very satisfied
- Location: 4% Somewhat satisfied, 32% Satisfied, 64% Very satisfied
- Day & time frame: 7% Somewhat satisfied, 39% Satisfied, 54% Very satisfied
- Is this your first time to attend an A&M or Extension Activity? 54% Yes, 46% No
- Would you recommend this type of event to someone else? 94% Yes, 4% No

Success Story 2016: Specialty Vegetable Production & Marketing Field Day: Training of the Trainers

Event was held Saturday, September 24th, 2016 from 9:00 a.m. – 12:00 p.m. at the Winfred Thomas Agricultural Research Station in Hazel Green, AL. The event was hosted by Alabama Cooperative Extension and Alabama A&M University. The activity was a final event relevant to a grant from USDA: Alabama Department of Agriculture and Industries. The initial training held one year ago focused solely on production and management. The goal of this activity was to provide training that producers and other Extension professionals could utilize to train other producers with similar interest in specialty vegetables. The objectives were to use training that addressed production, management, and marketing. A total of 23 attendees included potential farmers, experienced farmers, County Extension Coordinators (3), Extension and University Technicians (2), and Extension and University Specialist (4). Audience consisted of 10 females and 14 males, all adult, 12 black, 8 white, 2 Asians, 1 American Indian, and 1 other. The agenda included:

- Sign-in – Mrs. Rhonda Britton, Extension Technician, ACES UA&UANTP
- Welcome – Mr. Robert Spencer, Extension Specialist, ACES UA&NNTP
- Greetings & Orientation – Dr. Ernst Cebert, Interim Director, Winfred Thomas Agriculture Research Station
- Project Description – Dr. Srinivasa (Rao) Mentreddy, Professor, Crop Science, Alabama A&M University
- Site Visit – Lewis Bingham, Research Assistant, Winfred Thomas Agriculture Research Station, AAMU
- IPM Tactics: pest exclusion and organic insecticides - Ayanava Majumdar (Dr. A), Extension Entomologist, Commercial Horticulture Team Leader, Alabama Cooperative Extension System
- Cover Crops and Soil Improvement – Mr. Arnold Caylor, Director, North Alabama Horticulture Research Center
- Marketing – Dr. Rao Mentreddy & Mr. Robert Spencer
SMALL-SCALE SPECIALTY VEGETABLE PRODUCTION & MARKETING OPPORTUNITIES FOR SOUTHEAST UNITED STATES

Problem Statement
Traditional vegetable production as an agriculture enterprise tends to have associated risk. There are disease and pest issues, weather concerns, uncertain and unfamiliar markets, price variables, and competition from other growers. Specialty vegetables are new crops and have less disease and pest issues, the plants are more heat and drought tolerant, there is less price variation, and there is considerably less competition from other growers. Considering all these factors specialty vegetable production is much more viable and offers unique marketing opportunities, especially in a small-scale production situation.

Introduction
The US tends to be a net importer of fresh market vegetables, mainly from Mexico and Central America. Alabama, ranks about midway among production in the fifty states compared to its neighboring state, while Georgia tends to rank in the top five. Thus, Alabama has the potential and the need for increasing
vegetable production. The overall demand for US organic foods is very significant and demand for organic foods continues to increase. Increase in Alabama's Hispanic and Asian populations continues to grow significantly. The increasing demand for both ethnic foods and organic foods offers Alabama farmers tremendous opportunities to diversify, expand, gain by catering to the increasing immigrant populations of different ethnic backgrounds, mainly Hispanic and Asian (Indian and Chinese). Production of high value ethnic crops that are much sought after by ethnic immigrants in Alabama can help keep small farm enterprises viable because of greater returns from lower land and capital investment.

Thus, small-scale specialty vegetable production in the southeast U.S. has great potential for farmers seeking unique opportunities targeting distinct markets serving Asian, African, and Hispanic clientele. However, many of the specialty vegetables discussed in this publication are not readily found in most commercial grocery stores or farmers’ markets, yet many ethnic clientele are familiar with their culinary appeal and health value and will eagerly purchase them when found. While large-scale production may not be practical for this enterprise, famers with small tracts of land are provided unique economic opportunities if they are simply willing to grow and market this array of vegetables. The other advantage to growing these vegetables is that these are from warm humid climates such as Southeast Asia and Africa and therefore, may be prone to minimal insect and disease problems.

This publication is based on a four-year replicated field research at the Alabama A&M University Winfred Agricultural Research Station (AAMU-WTARS) in Hazel Green, AL and four on-farm trials across Alabama with funding from the Alabama Department of Agriculture and Industry NIFA-USDA-Specialty Crops Block Grant program.

**Vegetable Types**

Table 1. Specialty vegetable crops evaluated at the AAMU WTARS included but are not limited to those listed in the table 1.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Common Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggplant</td>
<td><em>Solanum melongena</em></td>
<td>Bartha, Thai, Bride, etc.</td>
</tr>
<tr>
<td>Peppers</td>
<td><em>Capsicum</em></td>
<td>Bell, Cayenne, Mariachi, Pepperoncini, Pablano, Habanero, etc.</td>
</tr>
<tr>
<td>Okra</td>
<td><em>Abelmoschus esculentus</em></td>
<td>Clemson Spineless, Bendhi,</td>
</tr>
<tr>
<td>Basil</td>
<td><em>Ocimum basilicum</em></td>
<td>Lemon, Thai, Red, Holy, Sweet or Genovese</td>
</tr>
<tr>
<td>Bottle Gourd</td>
<td><em>Lagenaria siceraria</em></td>
<td>Pusa Summer Prolific Long and Arka Bahar</td>
</tr>
<tr>
<td>Ash Gourd</td>
<td><em>Benincasa hispida</em></td>
<td>Bailan, Charentais, Crane, Hami, Korean, Montreal, Sprite, Sugar, Yubari King</td>
</tr>
<tr>
<td>Ridge Gourd</td>
<td><em>Luffa cylindrica</em></td>
<td>Pusa Nasdar, Des Chaitali, Phule Sucheta, Kankan Harita</td>
</tr>
</tbody>
</table>
Description and Use

Eggplant has large green leaves with white to purple flowers. The fruit is pendulous, tends to have a shiny skin and comes in a variety of shapes (elongated, round, and oval) and colors (black, white, and purple). It can be cooked many ways, with curry and spices, fried, in soups and stews, eggplant parmesan, and more.

Peppers come in many varieties, colors, shapes, and "heat". Capsaicin in peppers is a lipophilic chemical that produces varying degrees of burning sensation. People living in warm climates tend to seek out these hotter peppers as they feel it helps them acclimatize to hot climates. Peppers are a pendulous fruit, the leaves are green, and fruit color starts out as green and as they ripen turn to colors of red, orange, and yellow.

The okra plant has large green leaves, tends to be tall and bushy, and known for its fibrous fruits or pods containing round white seeds. It is among the most heat- and drought-tolerant vegetable species in the world. The fruit tends to be elongated, and has the nick-name of "ladies’ fingers". Most varieties of fruits are green and there is a red okra. Okra is known for the varieties of ways it can be prepared, battered and fried, cut long ways and dried, cooked with other vegetables, and in soups and stews.

There are an amazing number of varieties of basil. Each variety has a varying essential oil profile that come together in different proportions for various aromas, and flavors. It is a very hardy plant and grown throughout the world. It can be utilized fresh, dried and stored, or made into a pesto and frozen for future use. Studies of basil essential oil have shown antifungal and insect-repelling properties, and it is currently being studied for potential medicinal value.

Bottle gourd is a vine plant and of the cucumber family. It does best when grown on a trellis, and has broad green leaves and white flowers that usually open at night. The gourds grow long and narrow, up to a meter, and are a light green color. There are a variety of claims to health benefits to consuming the meat of the gourd. It is known for its content of Potassium, Magnesium, and Phosphorus. It can be cubed then cooked or boiled, often used in stews, soups, or pesto; it will take on the flavor of whatever seasoning is used. Also, the fruit can be sliced and made into pickles.

Ash gourd is sometimes called winter gourd or melon because it stores well into the winter. It is a vine plant and eagerly spreads. And is of the Inodorous WHAT IS THIS??(odorless) cultivar group, therefore related to the muskmelon or commonly known honeydew melon. The fruits become very large and heavy, therefore best grown on the ground and not on a trellis.
The fruit has a waxy feel and starts out green in color then appears ashy or white when it is ripe. Once the skin is removed the meat can be cubed and cooked in stir fry, soups, stews, and pesto.

Ridge or ribbed gourd is also a vine plant, has large leaves and yellow flowers, and of the Cucurbitaceae, cucumber, family. It does best on a trellis as it tends to sprawl and bears lots of elongated, ridged, green fruits. While the fruits will become very long, they are best consumed raw or cooked when less than 6-8”. As the fruit matures it becomes very fibrous and once dried, deseeded, and peeled can be used as luffa or loofa sponge. When cooked at its young stage it serves well in soups, stews, curries, and pesto. Young fruits can be sliced and made into pickles.

Bitter melon or gourd is a vine plant with many deeply separated lobe leaves and yellow blooms. It too is of the Cucurbitaceae family. The fruit is a greenish yellow oblong bumpy fruit resembling a short cucumber, and has a waxy feel. It is very prolific when established on a trellis. The fruit is best consumed while it still green, as the fruit matures it turn yellow into red and has brilliant red seeds. Bitter melon has an extensive history and list of medicinal claims. It can be served with yogurt to offset its bitter taste.

Malabar spinach is of the Basellaceae family, and not the spinach family. Unlike many leafy vegetables it is very prolific in hot climates and tolerates heavy rainfall. It is a fast-growing leafy vine with heart-shaped leaves. Leaves can be harvested when they are only a few inches long up to six to eight inches. It is high in protein and fiber, it also has significant content of vitamins A and C, iron and calcium. And has been claimed to have many health values. It can be used as a thickener in soups, serves well in stir-fry and stews, and goes well in curry and vegetarian dishes. The picture source: http://tendingmygarden.com/malabar-aka-malabar-spinach

**Soil Condition & Quality**

Quality soil is the basis for quality vegetable production. While the fore mentioned plants will survive in most soil types, an ideal soil type is sandy-loam, well-drained, and rich in organic matter. A pH range of 6.0 to 7.5 is ideal because it allows nutrients in soils to be more readily absorbed by plant roots. Soils should be tested once a year. A combination of ideal soil type and pH, and warm temperatures will insure healthy productive plants. Sixty degrees Fahrenheit (17 degrees C) is minimal soil temperature for seed germination and plant vigor. To ensure minimal soil temperatures for germination, production sites should always receive direct sunlight and possibly utilize mulch or black plastic.

**Growing Conditions & Planting timeframe**

All these plants are of tropical habitats and as such need warm sunny environments with growing season temperatures of 65 to 84 °F (19 to 29 °C). They will easily tolerate temperatures into the 90s and low 100s. Extremely moist soils can result in disease problems with seedlings and reduce germination. All these plants are sensitive to frost; some are not photoperiod-sensitive.

Seeds for all these plants are typically started in green houses eight to ten weeks prior to the anticipated frost-free date. While the seeds can be directly planted into the soil, it is better to plant them in seed trays or cups in a greenhouse and as they become hardy they can be planted into garden sites from late-April to early June depending on soil temperatures and location. Seeds planted directly in the ground should be done at anticipated frost-free date. Planting seeds in rows will work and is practical if the soil temperature is above sixty degrees and adequate moisture is available.

Germination times range from four to five days up to six or seven. Starting seeds in trays inside a green house or high tunnel and then transplanting to production site is the best option to ensuring early germination of seeds and increasing germination rates, giving plants an early start, and providing marketing advantage with early product availability.

**Management**
For seed or seedling establishment soils should be well tilled and absent of any weeds. Mechanical or manual labor can be used to control weed invasion. Choosing whether to use no-till with mulch or tillage is a management decision. Same applies to reliance upon rainfall or irrigation. Excessive moisture can be problematic and results in disease issues. Keep in mind all these plants are annuals. These crops respond well to fertilization with complete fertilizers that supply the three basic nutrients, N, P, and K. Rate of depends on soil type and soil tests. If using drip irrigation, fertigation with soluble fertilizer such as Peters 20:20:20 when grown using conventional methods or liquid organic fertilizers such as Multibloom™ or Neptune Harvest™ at 3 – 4-week intervals, particularly after each harvest.

**Pests & Disease Issues**

Beetles (Japanese, Colorado Potato) & Brown Marmorated Stink Bug tend to be the primary invasive pest, their presence is very sporadic. Spraying with appropriate insecticides two to three times a season eliminate infestation. Spraying with neem extract and Dipel™ is effective in controlling these insect pests in organic production system. Stranger ingredients are newly introduced specialty vegetables with limited acreage, therefore, disease is minimal. Water logging conditions can cause damping off in seedlings and with vine plants. Powdery and Downy Mildew tend to be an issue if plants overlap or excessive moisture is present. A lot of the insect and disease issues are management issues relating to overcrowding and excessive watering. When it comes to pest issues integrated pest management is very effective. Rotating these crops over time and space can help keep insects and diseases issues minimal.

**Harvesting**

Vegetable harvesting will normally begin about 7-9 weeks after seeds have germinated and slightly less for seedlings. Knowing this time frame allows for planning of maintenance and harvesting. Harvesting may start out slow in cooler conditions and will become frequent and abundant as summer temperatures set in. Use of plastic or cloth bags and containers, buckets or pails, or even wheel barrows are very practical for containing harvested vegetables. Be careful to avoid bruising or exterior damage when harvesting, washing, and packaging vegetables.

**Marketing**

Culinary appeal: The thing to remember about many of these vegetables is they are commonly seasoned with curry, peppers and onions and used in soups and stews, or curries, chutneys, pesto, and dips. Keep in mind primary clientele will be of Asian, African, and Caribbean descent who have a taste for spicy and hot foods. However, many typical Americans are interested in culinary versatility and health values of these products and looking for opportunities to impress friends and family with unique dishes.

Market opportunities: Opportunities exist whether it be farmers’ markets or specialty stores in any city or community that has a significant percentage of the fore-mentioned immigrant population. These same cities are likely to have Asian or African type restaurants who prefer to purchase fresh, locally-grown vegetables to integrate into their menu items. Many of these ethnicities are accustomed to visiting farmers’ markets where they can pick up the produce and examine. Once potential clientele is identified the key to success in marketing specialty vegetables is quality, quantity, and consistency. Stores and restaurants expect an ongoing supply of quality produce otherwise they will order from commercial vendors. Diversify marketing opportunities by pursuing farmers’ markets, restaurants, and direct sales from farm. Reliance upon one client or outlet leaves a farmer vulnerable to competition.

**Conclusion**

Small farm owners can benefit from increases in ethnic immigrant populations in U.S. cities by growing the fore-mentioned vegetables are normally not targeted by traditional vegetable producers. Whether it be farmers’ markets, ethnic oriented restaurants, faith-based facilities, or individuals, demand exceeds supply! Many ethnic groups: seek vegetables they are familiar with back home, know how to prepare them, know their health and medicinal values, and want to impress friends with their culinary qualities. While large-scale production of these vegetables might not be practical in some areas, anything from 1/8 to an acre or two will easily meet the demand and generate unique revenue sources. Production and Marketing specialty vegetables to multi-culture clientele will be a unique and enjoyable experience.

<table>
<thead>
<tr>
<th>Table 2. Specialty Seed &amp; Supply Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>------</td>
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</tbody>
</table>


I send out an email notice stating that all recipients of the Specialty Crop Block Grant submit their annual or final report. Most grantees do return but some require a subsequent telephone contact. I plan in the future to review the sub grantee’s final report with their original application to ensure all requirements are met. I am going to prepare an annual report check list to ensure proper response. I do perform site visits on all grantees throughout the year to ensure the work schedule stated on the grant application is followed. Sometimes grantees have had problems beyond their control (weather, pest, lack of interest from participants). I allow for these cases or have a Change in Objective form to be approved. If the reports or grant is not completed I would notify the Alabama Department of Agriculture’s legal department to begin proceedings to rectify the situation or recover funds. As of yet, we have not had that situation occur.

Disclaimer: We do not endorse any vendors or products mentioned in this publication

Resources:
Alabama Department of Agriculture and Industries

Mr. Johnny Blackmon

USDA AMS Agreement Number 14-SCBGP-AL-0001

Final Report

June 1, 2017

Specialty Crop Training Initiative
Project Summary

The focus of this project was to provide training for the Greenhouse, Nursery, Floriculture, and Sod Specialty Crop growers across Alabama. The Alabama Green Industry Training Center, Inc. delivered high-quality programming and supported regional programming efforts.

Specialty crop producers were limited in finding training for their workforces over the past several years due to budget restrictions and time constraints. More specifically, producers had limited funds to cover travel and fees for class attendees. By offering local training events, the specialty crop producers were able to have a workforce that was better educated in both the technical and safety content areas of their jobs while saving funding for other uses in their operations.

Project Approach

The project met its goal to provide the Specialty Crop producers (and their employees) with access to safety and technical training. The project had a target of providing and supporting live training classes for 180 participants and this goal has been met. The second goal was to have a minimum of 25% of the Specialty Crop producers and employees increase their knowledge over the course of the year. The evaluation analysis supports that the project also achieved this goal.

Activities performed include the following:

- Completed 39 training opportunities around the state presenting materials on safety, pesticides, and technical content. Each event offered producers access to information either in a class format or through one-on-one interactions.
- Completed the OSHA authorized trainer component of the project to provide growers with access to training for OSHA 10 and 30 hour cards in General Industry.
- Published the online course with a change in the scope of the training content from WPS training to OSHA Farm Safety.

Safety and technical training opportunities were offered via the classroom format to 224 attendees in 19 class events from December 2014 through March 2017. Class titles included the following: Hydroponics 101, Defensive Driving, Vegetable Gardening 101, Fire Ant Management Techniques, Worker Protection Standard Training, Specialty Crops Use in Containers, Aquaponics Workshop: An Introduction, Effective Turfgrass Establishment & Management, Industry Boxwood Blight Update & Training, Nursery Pest Management, Pesticide Safety for Turfgrass Managers / Producers, Pest Management Safety & Regulatory Compliance in Horticulture, and Worker Protection Standard Update: Train-the-Trainer.

In addition, safety and technical training opportunities were also presented in a one-on-one format to an additional 227 attendees at events across the state. In order to meet the contact goal of this training initiative, the project exhibited at partner events across the state providing one-on-one consultations to attendees. Examples of these events include the following: Alabama Turfgrass Road Show Series, Gulf State Horticultural Expo and Pesticide Education Day, Alabama Fruit and Vegetable Conference, and Alabama Turfgrass Field Day. These opportunities provided producers and users of specialty crops with information on pesticide safety, pesticide use, and applicator regulations. In a typical classroom setting, often attendees are unwilling to bring forth questions, but by being available outside of the formal class structure, attendees sought information to help them with their compliance and safety issues. Frequently, the attendees were able to obtain private and/or commercial pesticide applicator study materials and resources.
Two issues encountered by the project included the delay in materials from the EPA for WPS and the return of solid surveys from class attendees. The issue with the availability of the Worker Protection Standard (WPS) revised training materials lasted many months, and in fact, some delays are still in effect. Initially, the federally mandated standard (and related training materials) for the revised WPS training program were to be completed by the EPA early in this project. However, over the months, their timeline for completion received several extensions. This affected our project by slowing the completion of the online training component, but after changing the training content to farm based OSHA general industry training, the objective was completed.

One additional challenge was the receipt of completed surveys for the classes having measurable results. Surveys were distributed in class, but often, the attendees did not return a fully completed survey, if at all. In order to provide some consistency to our findings, the project’s measurements for knowledge transfer were measured from courses repeated at different locations covering the same content.

The contributions by the project’s partners were essential to the successful nature of the training. The partners provided assistance and access to their training programs, but more importantly, they brought an additional pool of attendees to the training events. This collaborative effort extended the effective reach of the training efforts. Additionally, the partners provided additional resources for advertising, data, and travel.

**Goals and Outcomes Achieved**

Since this project was a new venture, benchmarks for verifiable specialty crop training were not available before the project started. Our initial timeline for the project was one year with one goal of training 180 attendees in that period. However, the lack of updated training materials for the revised Worker Protection Standard pushed the completion date to February 2017. The goal of providing safety and technical training to 180 in specialty crops has been met. The project provided 451 participants with training over the 27 months of the project, averaging 16 participants per month or 192 participants for a 1-year period.

Through the project’s training efforts, the second goal was to improve producers’ knowledge of safety or technical training for at least 25% of the attendees. Again, this project did not have an established benchmark for verifiable specialty crop training. Of the viable survey responses received (response rate of 46%), 40% of the attendees for the classes improved their knowledge. In addition, it was determined from those surveys, the average attendee increased their knowledge of the subject material presented at the training classes by 34%. The measure of the increase in knowledge was based on questions asked of participants on a pre-class and post-class knowledge assessment.

When the project started, the training center led the training effort to meet the outcomes of the grant. However, in order to be successful with the transfer of knowledge to as many producers as possible, it was determined that supporting the training events of the project’s partners was essential to the project’s success. No funds promoted a particular entity; they allowed for travel across to the state to be a part of the additional training events.

**Beneficiaries**

The primary beneficiaries of this project were the specialty crop producers and users of the classes and events. By providing training and outreach, 451 attendees obtained information they used to help promote their businesses and products. The majority of the information disseminated was compliance and safety oriented which is essential for successful business operations.
In those classes presenting new or introductory technical matter, attendees were able to make informed decisions on how to integrate the new processes into their business strategies. Topics identified by attendees as most useful included: greenhouse management and operations, insect management and control options, possible customer options, plant varieties and selections, fertilizer use rates, and beneficial insects. Approximately 36% of the attendees also indicated they would anticipate a savings to their operations by implementing what they learned as best management practices and techniques presented in class.

Lessons Learned
The online training objective, as outlined in the grant proposal, was the last part of this project to be completed. The content for the new Worker Protection Standard (WPS) experienced significant delays from the Environmental Protection Agency and its partnerships. In order to bring this project to completion, the online curriculum changed from WPS to OSHA general industry and farm safety content. The WPS delay also had an impact on the classroom training for providing an update for the new requirements for producers. Due to this delay, the WPS update training provided producers with answers to their questions on a one-to-one basis and on-site training for producers’ handlers and workers.

An unanticipated positive impact by the project was the strengthening of the relationship between the center and the project partners. As stated earlier in the report, without the project partners, the training efforts would not have been as successful in terms of maximizing exposure to training attendees. By combining our efforts, the project was able to promote the training events of the partners along with providing an outreach service to their attendees at the events. It was a win-win for the project, the center, the attendees, and the training events.

The project encountered an unexpected challenge in getting the attendees to complete their surveys. Despite paper and electronic evaluation options, the project experienced issues with receiving the survey responses. The deployment of the electronic format did help increase some of the responses. However, this was not a guaranteed strategy for success. Fortunately, the project offered several classes on a repeating basis, which allowed survey responses to be grouped across multiple events of the same training content.

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Economic Impact Analysis of the Alabama Fruit and Vegetable Industry

Alabama Department of Agriculture & Industries

State Point of Contact: Johnny Blackmon

USDA AMS Agreement Number: 14-SCBGP-AL-0001

Final Performance Report

April 30, 2017

Prepared by
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Project Summary

The fruit and vegetable and tree nut segment of the horticultural industry is important to the Alabama’s economy. In 2012, this sector added about $81.6 million in cash receipts at the farm gate for the horticultural industry. However, there is no disaggregated National Agricultural Statistics Service data for this industry and the economic contribution of this sector has never been comprehensively evaluated.

The overall purpose of this study is to investigate the composition, performance, and the overall economic importance of the fruit and vegetable industry in Alabama (OBJECTIVE). This project will be the first study to investigate the enterprise composition of this industry and document the economic contribution of the major types of fruit, vegetable, and tree nut sectors in Alabama. The information provided by this project will directly enhance the development of this industry through publicizing its economic importance, encouraging investment, and improving competitiveness for financial and other resources.

Project Approach

Survey
This project was designed to provide detailed information about Alabama’s fruit and vegetable industry including industry composition, performance, and the overall economic importance. This was completed through a survey and an input-output analysis. The survey collected data such as types and production of fruit and vegetables, types of labor needed, expenditures for production, etc.

A comprehensive list of firms in each sector of the industry was compiled from lists held by Alabama Department of Agriculture and Industries, Alabama Fruit & Vegetable Growers Association, Alabama Pecan Growers Association, and Alabama Farmers Market Authority. We first developed the questionnaire for the mail survey. One month later, we also created the online survey using the Qualtrics to increase the response rate.

Since this research project involves human subjects, the research design needs to be reviewed and approved by Auburn University Institutional Review Board (IRB). After our research design was approved by Auburn University Institutional Review Board, we attended Alabama Fruit and Vegetable Growers Association for pre-test of the questionnaire. It took participants about 10 to 15 minutes to complete the survey. This pre-test confirmed that all questions were appropriate and understandable by the typical survey respondent. The questionnaire was then mailed with appropriate cover letters and material expressing the importance of this study for the industry. Key associations in the industry provided support to further validate the study and increase response rate. Follow-ups were be used to increase the response rate of the mail-survey. For online survey, we emailed the survey link to fruit and vegetable growers. We also put the online survey link on industry associations’ webpages.

Data Collection and Management

We summarized Alabama state fruit and vegetable industry data from 2012 USDA Census of Agriculture report and USDA NASS website, which were used as secondary data for this research. An Excel spreadsheet was developed for entering and summarizing survey responses. The information collected from both the mail survey and online survey were summarized.

Data Analysis

We first analyzed the historical trend of Alabama’s fruit and vegetable production using USDA NASS data and ERS data. We also constructed the IMPLAN model and estimated the total economic impacts of this industry. Four indicators were evaluated to represent the economic importance of this industry including contribution to state output, state employment, value added, and indirect business taxes.

Draft Report and Dissemination

We developed the final report with consultation with the various specialty crop industry representatives. The economic contributions for the entire fruit and vegetable industry and each sector were reported. Our results indicate that the fruit, vegetable and tree nut industry has a significant impact on Alabama’s economy in output ($161.5 million), value added ($103.6 million), jobs created (1,121 jobs), and indirect business taxes ($2.0 million). This industry generates additional 0.5 dollar in the state economy per dollar of output. On average, fruit and tree nut production generates over 17 jobs per $1 million in direct sales. Vegetable and melon production generates 8 jobs per $1 million in direct sales. Processed fruits and vegetables generate two additional jobs for each job within its own industry.
A color brochure was designed by Design Frenzy, Inc. A total of 550 copies were distributed to Alabama Department of Agriculture and Industries, Alabama Farmers Federation, Alabama Cooperative Extension System, Alabama Sustainable Agriculture Network, Clanton Research Center, Gulf Coast Research & Extension Center Station, Chilton Food Innovation Center, Tuskegee University, Alabama A&M University, and extension specialists.

Goals and Outcomes Achieved
The goal of this study is to provide the producers, industry professionals, and the public knowledge of the enterprise composition, performance and economic importance of the fruit and vegetable industry in Alabama. The report we completed consists of an executive summary, technical documentation of the methodology, narrative discussion of findings, and tables and figures explaining key results. Our color brochure highlights the key economic impact points of the industry. In total, 550 copies of color brochure were distributed to governmental officials, researchers, extension specialists, and key associations in the industry in Alabama. Our study was featured by Auburn University College of Agriculture Magazine, the Season, in fall 2017.
In addition, our study has been broadcasted by WTVM, and highlighted by Freshplaza, Alabama Farmers Federation, Alabama Agriculture Experiment Station, and Alabama Fruit & Vegetable Growers Association on their websites. Alabama Farmers Federation alone has over 360,000 members. Alabama Fruit & Vegetable Growers Association has about 400 members. Through broadcast media and these websites (see Additional Information), findings of our study have directly and indirectly affected many vegetable, fruits, and nut producers, farmers, industry professionals, researchers, and the general public in Alabama. In our proposal, we expected that over 2000 vegetable, fruits, and nut producers will be directly and indirectly affected by this study. In effect, the outcomes achieved are greater than established in the proposal.

Beneficiaries
This study documented the significance of Alabama’s fruit and vegetable industry based upon sound economic information. This will encourage investment in the industry by indicating investment opportunities. Our findings will also improve the industry’s competitiveness for financial and other resources. Over 2000 vegetable, fruits, and nut producers and the fruit and vegetable processing industry in Alabama benefited from the findings of this study. This study will also enable policy makers to make more informed decisions regarding the support of specialty crops development options, and guide future fruit and vegetable research by identifying and targeting needs.

Lessons Learned
The response rate of the mail survey was low. We realized that the season to conduct the survey matters. If the survey was mailed out in winter rather than spring or summer, more growers would have time to complete and return the survey. It would also be helpful if collecting data from key industry associations’ annual meeting.

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Additional Information
The following broadcast media and websites reported our study:
http://www.wtvm.com/story/35638714/study-fruits-and-veggies-have-healthy-impact-on-alabama-economy
http://www.freshplaza.com/article/177033/Study-shows-fruit-and-veg-industry-healthy-for-Alabama-economy
http://afvga.org/news/com
Alabama Department of Agriculture and Industries

Specialty Crops Block Grant Program

State Contact: Johnny Blackmon

USDA Project Number AMS3(14-SCBGP-AL-0001)

Final Report

Submitted by:

Dr. Elina Coneva

February 9, 2018

Project Title: Innovative Bunch Grape Production Technologies for Enhanced Sustainability of Local Food Systems
Project Summary:

Grape growing has increased significantly on a national and state scale in the last decade; however, current information and education on growing bunch grapes in Alabama is lacking. Alabama has factors in place that make the expansion of the existing bunch grape industry feasible, including the recent introduction and on-going research on Pierce’s Disease (PD) resistant *Vitis vinifera* grapes that is showing very promising results, as well as recently released seedless table grape cultivars. Recently, two commercial Alabama vineyards were granted a license to cultivate PD resistant *V. vinifera* selections, which makes Alabama a pioneer in cultivating a new specialty crop and provides our vineyards a cutting edge technology to overcome the Pierce’s Disease prohibitive *V. vinifera* production. Moreover, other factors are in place such as the 137 farmers markets throughout the state, 15 wineries, Alabama Wineries and Grape Growers Association with a membership of 125, heavily traveled highways, and numerous attractive tourist destinations, including Robert Trent Jones Golf Trail, can greatly facilitate the expansion of grape industry in the state. Thus, there is a significant need to educate grape growers in our state on implementation of these innovative technologies for sustainable production of fresh fruit for the local markets that can contribute to healthier diets of Alabamians and enhance the competitiveness of Alabama-grown specialty crops.

The objective of this project was to conduct four in-depth workshops and develop new publications to promote the implementation and facilitate the adoption of the currently available innovative grape production technologies.

- “The goal of this proposal is to educate growers on *V. vinifera* and other bunch grape production practices by delivering four in-depth workshops on bunch grape production that will facilitate the transfer the new grape technology (GOAL). Very limited information exists on successful *V. vinifera* and other bunch grape production in Alabama to assist grape growers willing to adopt the new technology (BASELINE). We anticipate at least two vineyards in Alabama to establish a commercial *V. vinifera* operations by 2016 (TARGET) and at least 5 more new vineyards by 2017 (TARGET) as a result of our educational effort through this proposal. PERFORMANCE MEASURE will derive from measuring the adoption of *V. vinifera* production. The interest in growing Vitis vinifera grapes in Alabama and the Southeast is extremely high. I have many requests from potential or existing growers about the newly developed vinifera selections regarding where to get planting stock in order to establish a vineyard. Regrettably, the release of the new material takes time and there have not been cultivars released for commercial propagation as of the end of this project, so it was not possible for more growers to plant the new material on their farm. The two current commercial vineyards growing PD resistant Vitis vinifera grapes are having a license agreement with UC Davis which other growers were not able to achieve at this point.

- “Develop extension publications to educate growers on bunch grape cultivar selection and best management practices for each grape species/cultivar (GOAL). Information sources on growing seedless table bunch grapes and *V. vinifera* grapes does not currently exist for Alabama (BASELINE). We propose to develop educational publications and leaflets targeting commercial grape growers, extension personnel, homeowners, and the general public that are expected to increase their knowledge on bunch grape and *V. vinifera* production by 60% (TARGET). PERFORMANCE MEASURE: Change in knowledge will be measured by pre- and post-educational program surveys at extension workshops. Based on pre-and post-programmatic surveys conducted at extension workshops, respondents reported 83% increase in knowledge on *V. vinifera* sustainable production practices. Number of web site viewers will be recorded using Google Analytics.” The number of viewers was not recorded.
Project Approach: Conducted Grape Production Workshops as Follows:

- **Coneva, E.** 2017. A workshop on hybrid grape pruning with hands-on demonstrations conducted on March, 7, 2017 at the Chilton Research and Extension Center, Clanton, AL.

- **Coneva, E., A. Svyantek* (Graduate Student).** 2016. Home, Farm, and Wildlife Expo held at the Chilton REC, Clanton on August 6th. We had over 1500 attendees and three presentations were made to highlight the project and demonstrate results to date.

- **Coneva, E.** 2016. PD Resistant Vinifera and Hybrid Bunch Grape Workshop with Pruning methods and Cultivar Demonstration. CREC, Clanton, AL, October 2, 2016.


- **Coneva, E.** 2015. Home, Farm, and Wildlife Expo held at the Chilton REC, Clanton on August 2nd. We had over 1800 attendees and three presentations were made to highlight the project and demonstrate results to date.

In summary, we have conducted eight Bunch Grape Production Workshops during the project duration in order to educate our constituents on innovative production technologies. Most of the educational programs offered included demonstrations and hands-on experience to our audiences. This exceeds by two folds the number of educational activities in the Work Plan of the approved proposal.

Goals and Outcomes Achieved: Developed and Published Grape Extension Publications in Refereed Journals:


Goals and Outcomes Achieved: Bunch Grape Technology Production Presented at the Following Professional Meetings, Conferences and Agent Training Events:

• Coneva, E. 2016. SE Professional Fruit Workers Annual Meeting, Gainsville, FL, October 4-6, 2016.


• Coneva, E. SE Fruit and Vegetable Growers Conference, Savannah, GA, January 7-10, 2016.


• Andrej Svyantek*, and Elina Coneva. 2016. ASHS Annual meeting, Atlanta, GA, August 8-11, 2016.


• Elina D. Coneva. 2016. 74th Professional Agricultural Workers Conference, Tuskegee University, AL, December 4-6, 2016.


• Coneva, E. 2015. SE Professional Fruit Workers Annual Meeting, Montgomery, AL, October 6-8, 2015.

• **Coneva, E.** 2015. IPM for Fruit Crops In-Service Training, Chilton REC, Clanton, August 10, 2015.

• Alabama Fruit and Vegetable Growers Annual Conference, Auburn, AL, February 6 - 7, 2015.

• **Coneva, E.** 2015. Fruit Crops Production Update. Commercial Horticulture Team In-Service Training, Chilton REC, AL, August 11, 2015.


**Goals and Outcomes Achieved:**

Posted grape-related content on social media and other agriculture/viticulture websites to educate growers and homeowners on new technologies in grape production.


In summary, seven in-depth Grape Production Workshops were conducted during the project duration offering educational opportunities to interested grape growers, master gardeners and general public. Nine grape extension publications were develop and information was presented at 21 growers and professional meetings to educate growers and homeowners on new technologies in grape production. The performance goals in our project Plan of Work were achieved and surpassed with numerous extra activities. One of the most significant accomplishments of this project is promoting the sustainable viticultural practices in the state and the region. As a consequence, the acreage of hybrid bunch grape production is growing in the state and new commercial wineries are being established. The project has achieved the target of assisting two commercial vineyards in Alabama to establish a commercial *V. vinifera* operations by 2016 as a result of our educational effort through this proposal and adopting the new technology of *V. vinifera* production. With this expansion, the project impacts local economy and spurs the agritourism in rural areas. All members of the Alabama Wineries and Grape Growers Association, as well as grape growers from the entire S.E. region, master gardeners throughout the state and the Southeast, and general public members have learnt about the new production technologies and benefited from the completion of this project’s accomplishments. The project results considerably
impacted current viticulture practices and provided the know-how for sustainable economic impact not only locally, but regionally in the S.E.

**Lessons Learned:** As a result of completing the project we have learnt there is a tremendous interest in the state and the region in growing not only hybrid bunch grapes, but also growing European grapes with resistance to Pierce’s Disease. Research and education needs exists to fill the lack of knowledge on proper vineyard management, especially concerning PD resistant European grapes. The number of commercial wineries in Alabama and the S.E. is growing and the need of education in enology is increasing.

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I send out an email notice stating that all recipients of the Specialty Crop Block Grant submit their annual or final report. Most grantees do return but some require a subsequent telephone contact. I plan in the future to review the sub grantee’s final report with their original application to ensure all requirements are met. I am going to prepare an annual report check list to ensure proper reponse. I do perform site visits on all grantees throughout the year to ensure the work schedule stated on the grant application is followed. Sometimes grantees have had problems beyond their control (weather, pest, lack of interest from participants). I allow for these cases or have a Change in Objective form to be approved. If the reports or grant is not completed I would notify the Alabama Department of Agriculture’s legal department to begin proceedings to rectify the situation or recover funds. As of yet, we have not had that situation occur.
A Pilot Project Utilizing Plasticulture in School/Community Gardens to Create Healthy Lifestyles

State Contact: Johnny Blackmon

Final Report

December 27, 2017
Project Summary

Plasticulture is extremely useful for making community gardens succeed. But currently plasticulture machinery requires a 50-60 horse-powered tractor with expensive bedding and plastic laying equipment. Just these two items alone are usually beyond a community garden's resources. This project was to address that issue.

The pivotal goal of this grant was to prove the use of an affordable, easily transportable and operational tractor with an equipment/implement system to lay plasticulture to help community gardens succeed. The idea that one or more charitable organizations could purchase the system and share it with any number of community garden groups. We were to prove the system at three elementary school sights and one retirement home.

Most of the horticulture problems that confront community gardens could be solved with this plasticulture system that could easily be moved from garden to garden on an eighteen foot trailer with a half-ton truck. Some of the organizational problems of working volunteers that confront community gardens leaders can also be relieved.

Many community gardens are destined to fail from the start due to improper ground prep, a constant need to weed the crops, water schedules, fertigation mistakes, lack of insecticide knowledge for bug control as well as improper herbicide usage. Plasticulture solves many of those problems by controlling weeds around the plants, with the plants on raised beds covered in plastic the need for insecticides and fungicide are greatly reduced. Plasticulture uses drip tape as its water source. Since drip tape is efficient in its water use (one gallon per minute per 100'), and since most city-county systems generate about 10 gallons a minute through an outdoor spigot, most all community gardens of \(\frac{1}{10}\) an acre or less can easily be supplied with water through one garden hose on an automatic timer. Fertilization is done through the drip tape where proper amounts delivered to plants each week can easily be calculated.

The community garden leaders are relieved from negotiating volunteers’ labor time by not having to weed the crop by hand, have constant insect and fungus spraying and watering with garden hoses with overhead irrigation which needs constant observation. With plasticulture, volunteers are needed in the beginning with laying plastic, hooking up water system and planting the crops and of course for harvest. Keeping the volunteer’s time in the field manageable to their livelihood career jobs, plus by keeping the work highly productive will keep volunteers engaged with the crop throughout the season.

The tractor and implements that was to be utilized for this project is made by the Tuff-Built Tractor Company. But after many trials and engineering adjustments, we found the tractor unsuitable for the job. The plow, which was designed for this project could not consistently plow at the needed six inch depth. Without the proper depth there was no way to raise enough dirt to make a full bed of dirt.
six inches high and twenty-five inches wide which was to be covered by plastic. The rota-tiller which is an essential tool in ground prep for plasticulture was too heavy for the tractor to control. The plastic laying equipment was sporadic in laying plastic tightly which is a most important aspect of plasticulture. There were other smaller problems such as the implements being hard to put on the tractor and too may separate pieces and adjustments to make some of the implements work. An added situation discovered late in the process was that the tractor was under 20 horsepower and therefore did not have to reach certain OSHA standards which the project thought important. These collected problems made the tractor unsuitable to plasticulture and for any recommendation from this project.

Project Approach

As the project worked with Tuff-Built employees on the Tuff-Built plastic laying system, hoping to make equipment work for at least one crop and create an affordable plasticulture system, the project went on with the planned community gardens using conventional plastic laying equipment borrowed from the Small Farmer's Marketing and Education Association and with borrowed 50 horse-powered tractors from local farms.

Seven hundred to a thousand feet of plasticulture was laid at three elementary schools: D.C. Wolfe in Shorter, Alabama; Dunbar Elementary in Ramer; and Carver Elementary in Tuskegee. Collard greens were planted at D.C. Wolfe and Dunbar on September 17 and 23 respectfully. But heavy rains delayed the Carver project past a suitable planting time for a collard harvest. The Carver project was then converted to strawberry plants which were planted on October the 19th. The D.C. Wolfe project planted 1000 collard greens while Dunbar planted 700. Each school had approximately 25 children plant the greens. Carver on the other hand had about 125 third grade students plant a 1000 strawberries.

All through the process of growing at the three schools, children observed the drip irrigation process, tended fields by walking through looking for insects. In the fall on the week of Thanksgiving, at D.C. Wolfe and Dunbar, the children helped with the harvest. The collards were then chopped by the administrators and kitchen employees cooked the greens for the schools to eat at lunch the schools next day lunch. At Carver Elementary, the strawberries started producing at mid-April and ended at mid-May. Over that time approximately 130 students were able to pick and take home around two pounds of berries each.

Children were given multiple choice questionnaires after planting the greens and then given the same after harvest and eating the crop. The questionnaires results were calculated by the grant's administrators for this report.

At Dunbar and D.C. Wolfe a second crop of squash seed was planted by the children on or around April 1. The crop at DC Wolfe made squash in time for the 25 participating children to pick and take approximately 3 to 4 pounds home. However, at Dunbar the crop was slow to produce and they were not able to participate in harvest. People in the community were
invited to harvest the crop for as long as it produced which they did till July. The poundage picked is unavailable. At Carver Elementary in the following school year the children planted approximately 800 collards for a fall crop where the strawberries had been. Unfortunately, even though an inexpensive deer fencing was placed around the field, deer destroyed the whole crop and the plastic mulch making an attempt to replant useless. At all the schools deer hampered production by eating parts of the crop and destroying the plastic mulch.

This project was to also put a plasticulture garden at an elderly home facility, but when the initial home withdrew participation, another suitable elderly facility could not be found. The project then turned to an equally worthy participate the Central Alabama Veterans Health Care System in Tuskegee (the V.A. Hospital in Tuskegee). In March of 2016, the project laid approximately 2000 feet of plasticulture. Veterans in the Hospital’s nutrition program participated as volunteers by planting the crops, tending the fields and harvesting the crops. In March the group planted approximately 1000 feet of Cole crops (collard, broccoli, kale, cauliflower).

In early April, tomatoes, various peppers, okra, bell peppers, squash, eggplant and watermelons were planted by the Veteran patients and some VA employees. The nutritionist at the VA, Ms. Collazo-Colon, organized the patients twice a week for nutrition lessons, harvest, and actually cooking some of the harvest at class sessions on healthy eating and serve the crop to the patients. Many times during harvest the crop was more than the patients could eat. That excess was at times given to the VA’s kitchen, but most times the produce was boxed up where local churches and shelters would pick up the food for those in need. From that May to October the project produced 300 pounds a month of fresh produce and donated more than a 1000 pounds to local shelters.

In July where the Cole crops were planted the Veteran patients planted pumpkins by seed. That fall just before Halloween the Veterans invited 35 of Carver Elementary honor students to pick the pumpkins from the field to take home. The event was an attempt to bring the community of Tuskegee closer to the town’s Veterans Hospital through interaction. Carver Elementary was to return the gesture with the Veterans coming to the school to help with the collard green harvest and take some collards back to the Veterans Hospital. But as stated, the deer ate and destroyed the crop at Carver Elementary.

The Veterans Hospital Compound is surrounded by an eight foot chain-link fence which stops deer production. But coyotes were able to get through the fence and they destroyed the watermelon crop. The coyotes did not disturb the other crops.

The use of the commercial plastic-laying equipment and money for collards and strawberries plants were donated by the Small Farmers Marketing and Education Association. The Alabama Department of Agriculture and Industries and the Alabama Agricultural Development Authority provided technical support.
with a plasticulture-irrigation specialist as well as transportation cost. The Federation of Southern Cooperatives provided technical support with a plasticulture irrigation specialist. The Alabama Cooperative Extension Service provided an onsite nutritional County Agent, Mr. Hurry, for the schools as well as resources at the Alabama Extension nutrition department stationed at Auburn University. The Central Alabama Veterans Health Care System in Tuskegee provided their clinical dietitian from the High Intensity Psychiatric Unit who organized the patient classes for planting and harvest as well as conducting nutrition class centered on the garden’s produce and for the produce’s distribution to the hospital and area community relief efforts.

Goals and Outcomes

The surveys conducted by the onsite Alabama Extension agent, Mr. Hurry, were compiled and evaluated by a nutritional specialist at Alabama Extension at Auburn University, Ms. Jamie Griffin. Enclosed are brief overviews of what Ms. Griffin saw in the tree classes surveyed as well as the graphs showing percentage out comes of before eating the crops and after. Please not that the collards were cooked not in the traditional manner with hog-fat and heavy salt, but with little oil and very little salt. On the graphs the color green are the pre-assessment response rates. The results in red are post-assessment response rates. The three classes are Mrs.Perkins, Mrs. Sparks and Mrs. Hough.

Perkins: (14 students, collard greens)

Students had improvements in their knowledge of fruits, vegetables and nutrients at post compared to pre-assessment. At post-assessment 100% of students stated they liked collard greens, with 86% saying they like them a lot and 14% saying they like them a little (compared to 100% of students saying they like them a lot at pre-assessment). Only 79% stated they would eat collards in the future (this was a decrease of 14% from pre-assessment), and 93% stated they would ask their families to buy collards in the future (no change from pre-assessment).

Sparks: (11 students, collard greens)

Students had improvements in their knowledge of fruits, vegetables and nutrients at post compared to pre-assessment. At post-assessment 100% of students stated they liked collards, with 36% saying they liked them a little, 55% saying they like them a lot and 9% saying they didn't try them. All these percentages improved from pre-post assessment. Only 73% stated they would eat collards in the future (no change from pre-assessment) and 73% stated they would ask their family to buy collards (no change from pre-assessment).

Ms. Griffin’s comments on collard green results: “My take away from these results is the students like collard greens, but if the cooking method used for these classes differed from what they are used to, they may not care for the taste of the collards. For example: If the collards weren’t cooked in fat back, bacon drippings, etc., but cooked without seasoning the
students may not care for the flavor”.

Hough: {15 students, strawberries}

Students had improvements in their knowledge of fruits, vegetables and nutrients at post compared to pre-assessment. At post-assessment, 97% of students stated they liked strawberries (compared to 100% at pre-assessment), with 67% saying that they like strawberries a lot (decrease from pre-assessment), 27% saying they like them a little (increase from pre-assessment) and 7% saying they didn't try them (no change from pre-assessment). 93% of students stated they would eat strawberries in the future (no change in pre assessment), and 100% stated they would ask their family to buy strawberries.

(Statgraphs follow on next page)
Nutrition Questions for Elementary Students

How many servings of fruits and vegetables do you think are healthy to eat each day?

A. 1 serving
B. 2 servings
C. 3-4 servings
D. 5 servings or more

What is an important nutrient in fruits?

A. Protein
B. Calcium
C. Iron
D. Vitamin C

What is an important nutrient in vegetables?

A. Vitamin A
B. Calcium
C. Portion
D. Sugar

Think about nutrients in foods. For the next 6 questions, put the letter next to each nutrient in the blank beside the correct food.

B. Calcium
E. Carbohydrates
A. Vitamin C
C. Protein
D. Sugar
F. Vitamin

Milk
Bread
Fruits
Meat
Soda
Vegetables

100% 100%
21% 100%
36% 86%
36% 93%
100% 93%
36% 93%
Think about how nutrients work in your body. For the next 5 questions, put the letter next to each nutrient in the blank beside the correct job.

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<th>答案</th>
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<td>100%</td>
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<tr>
<td>A. Vitamin</td>
<td>治愈伤口和淤青</td>
<td>57%</td>
<td>100%</td>
</tr>
<tr>
<td>B. Calcium</td>
<td>使骨头强壮</td>
<td>93%</td>
<td>100%</td>
</tr>
<tr>
<td>C. Protein</td>
<td>使肌肉强壮</td>
<td>43%</td>
<td>100%</td>
</tr>
<tr>
<td>E. Carbohydrates</td>
<td>给予你能量</td>
<td>21%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Do you like collards?

- A. Yes 93% 100%
- B. No 7%

After tasting collards, did you like them?

- A. Didn't try them
- B. Don't like them
- C. Like them a little 14%
- D. Like them a lot 100% 86%

Will you eat collards in the future?

- A. Yes 79%
- B. No 21%

Will you ask your family to buy collards?

- A. Yes 93%
- B. No 7%
The failure to establish a workable tractor and plastic laying implements to satisfy the needs of community gardens made a failure of another goal of creating a social media video to promote the tractor and plasticulture for community gardens. Our goal in doing that was to have 10 request for the equipment and actually service 5 new request. The project did receive a request from a Montgomery church for a thousand feet of plastic for collards so to service a local soup kitchen. Which we did using the conventional equipment. Also, two of the survey schools requested more plastic. Our group serviced the Carver Elementary because they put an adequate deer fence to protect the crop. The other school, D.C.Wolfe, did not have deer fencing and is currently looking for monies to erect one. Once they get the fencing our group will lay more plastic for them. We also laid more plastic for the Tuskegee Veterans Hospital and planted a 1000 strawberry plants along with 700 Cole crop plants. The goal was for 5 new request and we received 1 new request and 3 request from the grants project. Another lost goal was making the projects self-sustainable through selling their excess product to the public. With the collard greens the deer attacks at Dunbar dwindled their crop to being able to serve the students only. The collard crop planted after the strawberries at Carver was to be sold to accomplish this task, but the deer destroyed that crop totally. The unique problem at D.C. Wolfe was the school was so rural all the children all came in buses. We were unable to sell to parents coming to pick up their children which was the plan. We did manage to sell the plants to the teachers, school employees. Those monies were used to fund a raised bed garden project unrelated to this project. The Veterans hospital is unable under law to sell among other things fruits and vegetables to the public.

**Beneficiaries**

The 800 students at Carver, the 250 students a D.C.Wolfe, the 250 students at Dunbar and their families were benefitted by this project in terms of nutrition education, growing crops through plasticulture and actually eating the crops. The 30 to 40 participating patients at the Veterans Hospital garden as well as the patients that were served the garden’s produce, the people in need that received the Veterans excess crop benefitted from the creation of this project. With these project continuing on today the continual education and growing of crops this year will multiply those same numbers over this next year.
Lessons Learned

*The inability for the Tuff-Built employees and this project's staff produce an acceptable machine to lay plastic for community gardens was a disappointing blow to the grant's purpose. All through the time period of the grant the employees of Tuff-Built Tractor and the project's staff were confident there was to be a positive outcome. But it is clear the project's staff should have secured that the equipment would be successful before committing to the Block Grant proposal.

*The inability to find a suitable elderly home situation to put a community garden was an unexpected situation. But it yielded to the Veterans Hospital Garden which provided the largest impact of the project in direct help to Veterans in need of nutritional information, and a self-worth activity by donating their extra produce to the local community. It was also a surprise as the garden got national recognition through the Veteran Hospital social network that the Tuskegee garden was unique the Veterans Hospitals.

*Deer made production a struggle at all the elementary schools. Southern rural areas will always be infested with deer. If a garden project does not have substantial guard against deer attacks, all efforts will be a waste of effort.

*When putting together a school community garden be sure to know the time frame of your crop to make sure in will be ready for harvest during the school's semester periods. Also be aware of new holiday breaks that could change planting and harvest schedules. When working with school children gardens it is best to choose a crop that only has one major harvest like the Cole crops. Organizing the children for 2 or 3 picking days during the week is hard to accomplish and the constant picking will turn to work for the children instead of an event to enjoy.
Utilization of Novel Irrigation and Fertilization Practices to Enhance Pecan Production in Alabama
Project Title: Utilization of Novel Irrigation and Fertilization Practices to Enhance Pecan Production in Alabama

Project Investigator: Daniel E. Wells
Co-Project Investigators: James D. Spiers, Wheeler G. Foshee, Jeremy E. Pickens and Jeff L. Sibley

Project Approach

This project was conducted at the Gulf Coast Research and Extension Center in Fairhope, Alabama to determine the effects of phosphorus (P) fertilizer banding, in combination with irrigation practices, on pecan yield and quality and P uptake and availability. Rates of P application were based on the standard recommendation for raising P levels in pecan orchards of 40 lbs of P₂O₅/acre. This was used as the 1X rate. Rates of 0X, 1X, 2X and 4X were used in the experiment. The Phosphorus (P) fertilizer (0-46-0) bands were applied on March 20th, 2015 and replicated 5 times for each level. The P bands were only applied in 2015 to observe the effects of a single application throughout 2016. A standardized protocol for this was developed (Figure 1). Fertilizer bands were placed 3.05 m south of the trunk and measured 6.1 m long. The average width of a band was 10 cm. The aim of the application method was to place the fertilizer band near the drip line of the canopy which also corresponds to where the subsurface irrigation system is located. The orchard was split into two large blocks, one being irrigated and the other non-irrigated. To prevent the non-irrigated trees from picking up irrigation from the irrigated block a buffer row of non-irrigated trees separated the two blocks and no data was collected from them. A map of the orchard’s irrigation and treatment levels is included (Figures 2 and 3).

Soil samples were collected from three replicate trees per treatment in two-month intervals from May 2015 to July 2017. Three subsamples were collected from within the fertilizer band for each of the three replicate trees. Each collected core measured nine inches. This nine-inch profile was divided into three, three-inch sections that were pooled and used for analyses (Figure 4).

Foliar samples were collected on July 20, 2015, 2016 and 2017. The foliar samples were collected from middle leaflets of the current season’s growth (Figure 5). A cherry picker was used to collect two samples from the North and South sides of replicate trees. This corresponds to the side of the tree that received the band and the opposite side of the tree. The samples were processed and data analysis has been performed.

Nuts were harvested and yield data from all experimental trees was collected on November 2015 and 2016. The trees were shaken and the nuts collected from four quadrants of the tree which can be used to calculate total yield of the tree. The nuts were promptly cracked, shelled and frozen for quality analysis to be conducted later.

Goals and Outcomes Achieved

Our goals for this project were:

1) To determine effects of novel P fertilization and irrigation on pecan yield and quality and soil fertility
2) To communicate results to pecan growers in Alabama
3) To improve pecan yield in Alabama

Goal 1:

A summary of results of P banding and irrigation on soil test P is as follows: (Tables 1-3)
1) Increasing P rates increased soil test P in the soil at all measured depths.
2) Soil test P decreased with depth.
3) There is consistently more soil test P at higher rates over time.
4) There is less soil test P over time at most rates with the exception of the controls and the 1X rate in a non-irrigated setting
5) There is less soil test P over time at all depths
6) Soil test P remained high for the entire experimental period.

A summary of results of P banding and irrigation on P uptake in pecan is as follows: (Table 4 and Figure 6)

1) The side that the P band is applied to has no influence on P uptake by the tree.
2) P uptake was only increased at the 4x rate in non-irrigated trees
3) P uptake was not significantly different in irrigated trees.
4) Year was significant for P levels in both irrigated and non-irrigated pecans
5) Zinc was not statistically significant at the 0.05 level but would be at the 0.1 level which would still affect biological functions. The trend was antagonistic with applied P.

In 2015 and 2016 the rate of P applied had no effect on pecan yield or quality in irrigated and or non-irrigated trees

Goal 2:

Results of the project were presented at the following commodity group and/or research meetings:

1) 2015 Alabama Pecan Growers Association Meeting ~150 in attendance
2) 2016 Florida Pecan Growers Association Meeting ~ 50 in attendance
3) 2017 Alabama Pecan Growers Association Meeting ~ 150 in attendance
4) 2016 American Society for Horticultural Sciences Southern Region Annual Meeting, San Antonio, TX ~ 50 in attendance
5) 2017 American Society for Horticultural Sciences Southern Region Annual Meeting, Mobile, AL ~ 50 in attendance

Our results indicate that a single banded application of P fertilizer does not significantly increase pecan yield or quality with or without irrigation and may inhibit uptake of Zn, a nutrient which is often deficient in pecans. This finding is important because it has helped pecan growers in Alabama and throughout the southeast better understand orchard fertility management and the potential pros and cons of P banding and irrigation.

Beneficiaries

1) Pecan growers in the southeastern U.S., especially Alabama pecan growers.
2) Scientific community
3) Citizens of Alabama
Lessons learned

This project progressed smoothly and although we did not see an increase in yield or nut quality we believe these results will help pecan growers in the future.

Contact Person

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Additional Information

Michael F. Polozola II’s dissertation is in preparation now. Two chapters in his dissertation will include results from this experiment. In addition, we will submit those chapters for publication to HortScience later this year.
Figures

Figure 1. The P fertilizer band was applied in a 6.1 m. long, 10 cm. thick band 3.05 m. from the trunk of experimental trees.

Figure 2. The orchard was split into irrigated and non-irrigated blocks with a buffer row in between. D = 'Desirable' trees while E = 'Elliott' trees. All experimental trees were 'Desirable'.

Figure 3. The 'Desirable' trees were randomly treated with bands of 0x, 1x, 2x, and 4x P rates based on the recommended application rate of 40 lbs P₂O₅/acre.
Figure 4. Soil samples were collected in 9-inch cores and were divided into 3, 3-inch sections for analysis.

Figure 5. Middle leaflet pairs, from current season’s growth, were collected on July 20. Samples were collected from the both banded and non-banded sides of experimental trees.
Figure 6. The relationship of foliar P and P rate was quadratic without irrigation with it taking the 4x rate to increase foliar concentrations of the nutrient.

Table 1 Soil Phosphorus: Rate*Depth

<table>
<thead>
<tr>
<th>Non-Irrigated Pecans</th>
<th>Irrigated Pecans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate 3 6 9 Sign.²</td>
</tr>
<tr>
<td>Depth</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>67.5 41.9 35.3 NS</td>
</tr>
<tr>
<td>1</td>
<td>277.6 235.4 192.0 L**</td>
</tr>
<tr>
<td>2</td>
<td>526.7 373.7 307.3 L***</td>
</tr>
<tr>
<td>4</td>
<td>702.0 485.9 420.5 Q**</td>
</tr>
<tr>
<td>Sign.</td>
<td>Q*** Q*** Q***</td>
</tr>
</tbody>
</table>

² Non-significant (NS) or significant (Sign.) linear (L) or quadratic (Q) trends using model regressions at P < 0.05 (*), 0.01 (**) or 0.001 (**).
### Table 3: Soil Phosphorus: Depth*Period

<table>
<thead>
<tr>
<th>Period</th>
<th>Non-Irrigated Pecans</th>
<th>Rate</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>47.1 287.2 528.6</td>
<td>811.9L***</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>41.7 219.2 527.0</td>
<td>615.1G*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>60.2 258.7 541.7</td>
<td>685.9G*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>41.4 188.3 423.6</td>
<td>585.3L***</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>49.7 260.4 484.7</td>
<td>577.7G*</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>47.2 272.2 403.1</td>
<td>655.6L***</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>51.2 293.7 433.7</td>
<td>596.4L***</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>42.9 256.1 378.7</td>
<td>662.4L***</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>47.9 83.7 178.0</td>
<td>430.2L***</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>82.2 264.3 318.1</td>
<td>338.0L**</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>36.6 210.2 361.8</td>
<td>357.0G*</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>31.7 219.2 360.2</td>
<td>346.2G*</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>45.2 299.5 345.2</td>
<td>375.7G*</td>
<td></td>
</tr>
</tbody>
</table>

Sign. NS NS L*** L***

### Table 4: Pecan Leaf P

<table>
<thead>
<tr>
<th>Year</th>
<th>Phosphorus, no irrigation.</th>
<th>Rate</th>
<th>Phosphorus, irrigation.</th>
<th>Year</th>
<th>P (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>0.128</td>
<td>0</td>
<td>0.125</td>
<td>2015</td>
<td>0.133</td>
</tr>
<tr>
<td>2016</td>
<td>0.120</td>
<td>1</td>
<td>0.122</td>
<td>2016</td>
<td>0.125</td>
</tr>
<tr>
<td>2017</td>
<td>0.127</td>
<td>2</td>
<td>0.124</td>
<td>2017</td>
<td>0.121</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sign. Q*** Q*
I send out an email notice stating that all recipients of the Specialty Crop Block Grant submit their annual or final report. Most grantees do return but some require a subsequent telephone contact. I plan in the future to review the sub grantee’s final report with their original application to ensure all requirements are met. I am going to prepare an annual report check list to ensure proper response. I do perform site visits on all grantees throughout the year to ensure the work schedule stated on the grant application is followed. Sometimes grantees have had problems beyond their control (weather, pest, lack of interest from participants). I allow for these cases or have a Change in Objective form to be approved. If the reports or grant is not completed I would notify the Alabama Department of Agriculture’s legal department to begin proceedings to rectify the situation or recover funds. As of yet, we have not had that situation occur.
Alabama Department of Agriculture and Industries

Johnny Blackmon, State Point of Contact

USDA AMS Agreement Number 14-SCBP-AL-0001

Final Report

December 20, 2017
1. Project Summary

The purpose of this project was to increase the number of natural pollinators, specifically honey bees, to benefit food and plant producers in the state. Feral honey bee populations have been declining in the past decade throughout Alabama, as a result, the crop producers are relying on managed honey bees to pollinate their crops more than ever. This project was initiated in the hopes of increasing the number of managed honey bee colonies (beekeepers) in the state, thereby, increasing the number of pollinators.

One member of the Local Beekeeper Association was responsible for the initial instruction of basic beekeeping for the Natural Pollinator Enhancement Project participants. This member educated participants on bee biology and other beekeeping fundamentals. He supplied participants with beekeeping resources to allow program participants a method to further develop their beekeeping skills during the program.

2. Project Approach

This project started with 25 participants, chosen statewide. Participants received two colonies of honey bees each, received start up instructions as well as field visits, and direction from project coordinators. From the original 25 participants selected, 17 remain active in beekeeping. The 8 that dropped out lost all colonies. Four participants lost their original 2 colonies in the first year and never returned to beekeeping. The other four lost their colonies within the last year and may or may not return to beekeeping. Without exception, the remaining beekeepers say they have had a positive experience overall and intend to stay in beekeeping. Hobby beekeeping can be difficult and expensive at times, so having 17 participants remaining active is a very positive result.

In the initial planning of the Pollinator Enhancement Project, ADAI Apiary Specialists planned to utilize the Auburn University Pesticide Residue lab and the Auburn University Apiary Lab. However, no samples were collect during the project period because there were no regulatory issues to be examined.

One member of the Local Beekeeper Association instructed the participants on the basics of beekeeping, bee biology, and other beekeeping fundamentals. He provided participants with “First Lessons in Beekeeping” written by Dr. Keith Delaplane from the University of Georgia.

3. Goals and Outcomes Achieved

Twenty-five participants were selected from a pool of one hundred twenty-two applicants state-wide according to specifications set out in the application. The requirements were:

- a first-time perspective beekeeper-never having previously managed a bee colony
- join a local beekeepers association in their area, select a mentor from the association after joining that would be willing to work along with them in addition to the project administrators
follow all instructions and advice from mentors and project administrators.

First, the twenty-five applicants were informed of their selection by phone or letter, along with a project beginning survey to measure their knowledge of basic beekeeping. In preparation for the initial meeting with the chosen applicants, the project administrators assembled 500 frames and installed 500 plastic foundations and hot wax dipped 50 brood boxes and bottom boards. Two meetings were scheduled. The February 28, 2015 meeting was a four hour meeting conducted with an introduction, information, textbook and a question and answer session followed. The textbook used was: “First Lessons in Beekeeping” by Dr. Keith Delaplane. The April 4, 2015 meeting lasted from 7:00 a.m. – 4:30 p.m. included package and equipment pick up. Each participant received 2-three pound package of bees (including a queen), along with two complete hive brood boxes, and instructions as to what to do each day after installation. A demonstration of how to light a smoker and how to install a package of bees in a hive were done.

The applicants were instructed to establish their hives and establish their colonies by following the instructions given. They were to consult mentors and project administrators if they required assistance. The mentors could provide day to day advice if needed.

Three applicants lost a queen due to various reasons; one applicant lost a complete hive; one of the hives did not thrive, so it was recommended that the bees be combined and split between the two applicants in the 2016 season. Six applicants successfully harvested honey from their hives. Thirteen chose to over winter their bees with this seasons’ honey.

The greatest accomplishments were those who were able to establish colonies, get them thriving and harvest honey. Two applicants were able to split their colonies and increase the number of colonies by one.

At the project conclusion, the increase from the original 40 colonies was an additional 56 colonies. This adds 30-40,000 pollinators per colony to the environment. Hopefully the number of colonies will continue to increase, helping to boost the honey bee population and increase the number of natural pollinators available in the long term. Although the initial goal of 25 new beekeepers was not achieved, the addition of 17 new beekeepers is a good thing for our pollinator population.

In the initial work plan for the Natural Pollinator Enhancement Project, ADAI Apiary Specialists also planned to purchase alternative natural pollinators, primarily Bumble Bees for vegetable producers to utilize in pollinating crops. However, the Bumble Bee colonies proved to be too costly and would not be delivered in a time to pollinate the crops.

On the initial meeting of the grant participants, a project beginning survey test of 30 questions was given on basic beekeeping and pollination. The average score on the pre-test was 48% of questions answered correctly. At the conclusion of the grant period they were given the same test as a post survey, over the phone with no notice. The average score of the post survey was 82% of questions answered correctly. All participants were asked if their experience in beekeeping was positive to this point and 15 out of the remaining 17 said that it had been.

4. Beneficiaries
Several groups benefitted from the National Pollinator Enhancement program. The Alabama Beekeepers Association added 17 new beekeepers to the state, increasing the number of colonies within the state. This increase in honeybee colonies benefits the crop producers who rely on managed honey bees to pollinate their crops. This program gave those interested in becoming a first-time beekeeper the information and direction they needed to establish their own colonies. These beginner beekeepers now have the ability to continue to maintain and hopefully expand their colonies to increase the honey bee population within our state. The 17 new beekeepers were effective in establishing 56 new colonies in our state, increasing the honey bee population by approximately 2.3 million pollinators.

5. Lessons Learned

The Alabama Department of Agriculture and Industries Apiary Specialists learned various lessons from this project. In the beginning of the project, 2 -three lb packages of bees were given out to the new start up beekeepers. However, many of the bees transported in the packages became stressed and died, leaving the beekeepers with fewer bees to establish their colonies.

Several problems occurred in the second season for the new beekeepers participating in the program. Swarming and subsequent failure of the colony to requeen itself, as well as weather conditions (which contributed to the low quality of nectar and pollen in some locations), caused several of the beekeepers to lose their colonies coming out of the first winter season. Coming into the second season only 19 of the original 25 participants still remained due to the problems effecting the establishment.

In the last season establishing the new beekeepers, two beekeepers lost colonies and may or may not return to beekeeping. These issues brought the number of beekeepers established through the Natural Pollinator Enhancement Program to 17 new beekeepers with an additional 56 new thriving colonies.

6. Contact Person

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   334-850-7758
   Randy.Hamann@agi.alabama.gov
Auburn University at Montgomery Small Fruit and Nut Teaching and Demonstration Gardens

State Contact: Johnny Blackmon

USDA-AMS3(14-S CBGP-AL-O001)

March 6, 2017

PROJECT SUMMARY

The purpose of the project was to raise awareness of the potential economic and nutritional value of several small fruits and the Chinese chestnut. Currently in Alabama, there are very few producers growing nut crops other than pecans. The project had as a primary focus the encouragement of small urban and rural farmers and foresters to plant groves of chestnut with companion plantings of small fruits. The project created teaching and demonstration gardens in several high school Ag programs, two community and elementary sites, and one college campus. In addition to the Chinese chestnut, emphasis was placed also on other high value crops including blackberries, figs, gogi berries, oriental persimmons, and others to introduce class attendees and potential growers to the production and the consumption of the crops as well.
Many Alabamians have poor diets and introducing them to these crops will encourage their consumption and in some cases the class attendees may grow the crops around their homes and farms for sale or personal use. Some of the class participants were hundreds of Fairfield City Schools students, K-5, who had never eaten many of the crops including figs, oriental persimmons and muscadines. Introducing young children to new fruits and vegetables early in life is an excellent way to create a life-long consumer and to improve diets at the same time.

This project was not built or enhanced on previously completed work.

PROJECT APPROACH

Auburn University at Montgomery (AUM) identified sites for Small Fruit and Nut Demonstration Gardens and oversaw degreed horticulturists, students and volunteers who installed and maintained the sites. The focus of the gardens was to teach students and community members about the economic, nutritional and culinary value of small fruits and nuts along with how best to design, install and manage the gardens.

Major emphasis will be placed on the encouragement of more production and consumption quick harvest crops such as strawberries, blackberries, figs and others.

As part of this effort, combined with our existing statewide Beginning Farmer Rancher training, the sites provided excellent learning labs, increased awareness of and appreciation for small fruit and nut crops.

AUM and Green Industry Web Portal staff and partners conducted on-going, practical training at each site several times or more during the grant period. Additionally, three formal tuition-free day-long classes were taught featuring small fruit and nut culture and use.

GOALS AND OUTCOMES PROJECTIONS/ACHIEVEMENTS

- In comparing actual accomplishments with the goals established for the reporting period:
  In almost every project goal, the actual results meet or exceed the initial goal (as is shown below). We worked with more students in classes than expected. We had more students, community volunteers, and growers in lab and planting activities and have greatly increased demonstration and growing areas at many sites.
  
  o Expected Measureable Outcome: The content will reach 5,000 high school Ag teachers/students and specialty crops growers within two years.
• Actual Outcome: AUM has supplied information in hard copy, web-based, and other electronic formats to 5,000 plus students, growers, teachers, volunteers, etc. For every teacher reached, 150 plus students each year will be taught using the provided content. The numbers with that multiplier will far exceed our goals. At this time, 150 teachers have the flash drive. The results in approximately **22,500** students potentially impacted.

  o Expected Measureable Outcome: Through the teaching of three day–long classes to assist 75-100 growers, Ag teachers and other attendees, combined with on-going mentoring regarding the chestnut and small fruits, 10 participants will install growing areas within two years.

• Actual Outcome: Through the teaching of the five day–long classes to assist the 155 growers, Ag teachers and other attendees, combined with on-going mentoring regarding the chestnut and small fruits, 40 class participants have installed growing areas or added to existing sites.

  o Expected Measureable Outcome: Class attendee’s Specialty Crops knowledge, as measured by pre and post class written exams, will increase by **25%**.

• Actual Outcome: Formal class attendees’ pre and post-tests results revealed a **30%** increase in Specialty Crops knowledge.

  o Expected Measureable Outcome: More than **500** growers, Ag teachers, students and community members will participate in a minimum of **30** hands-on Specialty Crops training sessions in the two-year period following garden installation. At least 60% of those attendees will be able to demonstrate proper cultural techniques in the field during the sessions.

• Actual Outcome: The predicted number of **500** growers, Ag teachers, students and community members participated in **30** hands-on Specialty Crops training sessions. Since this was the expected outcome for the two-year period following garden installation, this outcome has been **exceeded**. This has occurred due to the large influx of community volunteers and students. Many of these attendees have agreed to take future classes and help with garden and orchard planting and are planning to install gardens at other sites.

  o Expected Measureable Outcome: **Five hundred** students and class attendees will participate in structured taste testing to familiarize themselves with the
targeted fruits and nuts and indicate the personal palatability and quality measurement of each through a survey.

- **Actual Outcome:** More than 500 students and class attendees participated in structured taste testing to familiarize themselves with the targeted fruits and nuts and indicate the personal palatability and quality measurement of each through a survey.

- **Expected Measureable Outcome:** Promotion will include the development of:
  1. An article for inclusion in ALSDE, ADAI and AUM publications and place a synopsis of the project on the GIW Portal.
  2. A class promotional piece in three newsletters mailed to 4,500 Green Industry companies and individuals each time.
  3. A 50-page manual, from land grant sources, on crop culture, disseminated to 75 attendees during the grant period and an additional 125 in the two years following grant completion.

- **Actual Outcome:** The three above promotional activities have occurred. The promotional piece was actually placed in four, not three, newsletters. The manual ended up at 100 pages instead of 50 and has been loaded onto a flash drive and distributed to attendees and others for greater ease in use.

### PARTNER CONTRIBUTIONS

- AUM and partners, including six horticulturists from the Green Industry Web Portal, Alabama Cooperative Extension System, Petals From the Past and Myer’s Plants and Pottery taught a series of five formal classes for growers and potential growers (155 total attendees), eight presentations to garden clubs (135 attendees), and dozens of practical demonstrations with school children, growers and community volunteers (1,000 attendees). Formal class attendees’ pre and post-tests results revealed a 30% increase in Specialty Crops knowledge.

- AUM and partners conducted more than 500 taste tests of many types of fruit, reaching many different conclusions, in part:
  - Children much preferred sweeter, smoother textured fruits like muscadines, persimmons and apples and were much less likely to enjoy figs and grittier pears.
Older attendees were more likely to state that they enjoyed figs and dried fruits.

Gogi berries may be really good for you, but the taste doesn't match the health benefits.

One very troublesome finding is the very low quality of fruit available in rural and inner-city stores. Bacterial and fungal storage rots were common and sugar levels were very low in much of the selected produce. Consumers exposed to fruit of that quality are better off eating canned, frozen, or dried produce. The issue with the low quality of the fresh produce available was then exacerbated because it was so costly.

None of the school children we worked with had ever eaten Asian pears, Japanese persimmons, or pomegranates, and few had ever eaten fresh figs.

Children who were initially repulsed by fresh figs with the first taste test often asked for more when picking the next week. This supports the rationale that drives many USDA and ADAI Specialty Crops’ school feeding programs.

- AUM and partners helped class participants install and maintain community and demonstration gardens at eleven sites including the Creek Community Garden in Atmore; the Campus Community Garden at AUM; Jefferson Memorial Gardens Cemetery in Trussville Community Garden; the Shelby County Demonstration Garden in Calera; Donald, Robinson, and Glen Oaks Elementary Schools in Fairfield; Forest Hills Pre-K in Fairfield; Midfield Elementary; McAdory High School; and Daphne High School. To help with these projects, over 500 volunteers and community members and 400 children spent 3-4 hours each on one of the sites performing basic maintenance and learning more about growing Specialty Crops. Some of these groups included 125 Ernst and Young employees and student helpers, 50 Brasfield and Gorrie Summer Interns, 45 UAB Into the Streets Participants, and 100 MLK Day Participants.

  Additionally, approximately 40 paid staff and contractors supported the construction, installation and management of the gardens. These staffers work for the Poarch Creek Indians, Myers Plants and Pottery, the Green Industry Web Portal, Sodexo, Midfield City Schools, City of Fairfield, and Jefferson County Schools. More than $40,000 in supplies and labor were used on the sites in addition to the grant funding.

  AUM and partners have created three videos, filmed in production areas, to support Specialty Crops teaching and growing efforts.

  AUM and partners have created a 100-page Specialty Crops class supplement and has compiled the supplement, Power Points, video, and other content on a flash drive that is being given to class participants, including high school Ag teachers, growers and other industry members.
AUM and partners placed Specialty Crops class ads in four GIW Portal mailers sent to over 5,000 Green Industry companies. Information on the classes and projects was placed on the GIW Portal Facebook page, weekly e-mails to 3,000 companies and 400 Ag teachers. Additionally content was placed in Alabama Urban Forestry Association and Better Basics newsletters, e-mails, and Facebook pages.

AUM and partners are creating an article for inclusion in ALSDE, ADAI and AUM publications and placed a synopsis of the project on the GIW Portal.

Fifty class participants installed or expanded Specialty Crops growing areas on their property or land they help manage. Many of these growers plan to expand their efforts in the coming years.

<table>
<thead>
<tr>
<th>Lessons Learned</th>
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<tr>
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</tr>
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<td>There were several unexpected outcomes or results that were an effect of implementing this project. First, we were overwhelmed by the numbers of community and corporate volunteers who showed up and prepared gardens in temperatures over 95 degrees doing hard physical labor. In addition to their work, corporate and college partners donated funds for additional plants, concrete masonry unit garden enclosures, etc. that exceeded $40,000. Recently at the Forest Hills Pre-K, a group of five Eagle Scouts installed an irrigation system, which will make future gardening much more successful.</td>
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The results of this project were wonderful and the efforts of so many volunteers, humbling. The accompanying power point will show a sea of crops at various sites.

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- All goals were achieved or, if multi-year goals are truly on the way to achievement. Many of the goals have been exceeded. Early in any garden-related project, everyone on-board should understand that timing and weather is paramount. Sometimes activities must be sped-up at the last moment or delayed in others due to the needs of the garden. Gardens don’t always fit projected schedules and are not always “clean and neat.”

**CONTACT PERSON**

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Johnny Blackmon- state contact

Michele McClung- school principal

Grant Agreement Number 14-SCBGP-AL-0001
Final Performance Report

11/4/2016
**Project Title**  Hawk’s Park Outdoor Learning Center  

**Project Summary**  
The purpose of the grant was to help our school establish a school and community garden project that would allow opportunities for Dawes Intermediate students, while allowing teacher, parental, and community guidance and participation for a complete school community cooperative experience. We wanted to have the opportunity to take learning out of the traditional classroom and provide an outdoor learning center with hands-on experiences to connect real life to the learning of mandated curriculum. Our outdoor learning center enhances the educational experience at Dawes Intermediate School, one that our students will recall for a lifetime.

A specific issue we wanted to address is the fact that as low as 1% of Americans grow food that all of us consume. With projected growing population by 2050, we need more farmers to keep up with the demand of hungry bellies. Another issue we were able to address was the overwhelming statistic that our students have never grown food and they reported not liking the taste of fresh fruit and/or vegetables. This being their major growth spurt years, we felt compelled to have our students grow food knowing their vested interest would prompt them to try new fruit and vegetables.

Our project built on other grants written and funded by local businesses, foundations, and non-state/federal organizations. We were grateful to make new connections through the USDA and showcase our project to USDA employees that work with farm to table initiatives and school cafeterias in a couple of states.

**Project Approach**  
Activities performed during the grant period includes filling our garden beds with dirt and soil. Purchasing tools for students to use in their gardening lessons with the Junior Master Gardening program. Providing professional development (initial and ongoing) to the faculty and staff at the school so they were prepared with first steps in gardening. Students grew fruit, vegetables, and plants. They charted growth of plants, recorded the growth and compared growth between seeds and transplanted seedlings. Students completed the Junior Master Gardening program school-wide and used our gardens as their community project. Significant results included 535 Junior Master Gardening certificates, an increase from 12 percent to 100 percent of our students who have grown specialty crops. An increase from 23 percent to 100 percent of our faculty and staff growing a specialty crop. We recommend this program to all. Unusual developments noted with our severe special needs students who were able to calm down once they were brought to Hawks Park Outdoor Learning Center. The gardens are a peaceful place and are used to provide another intervention to struggling students. One final unusual development discovered was that our 5th graders took so much pride in the gardens that they volunteered to help sustain the beautification of our park.

Significant contributions and roles of project partners in the project came from vendors we purchased plants and seeds from, parents who volunteered to help maintain the park, the Extension Co-op through Sara Buttersworth for ongoing professional development, involvement of grandparents and parents in the community. The Bedsole Foundation enjoyed seeing us move out of construction phase funded in part by them and into the planting stage funded mostly by USDA. We had much press and coverage by the news media and this project allowed us avenues to apply for awards like the National Blue Ribbon School of Excellence Award received this year in 2016.

**Goals and Outcomes Achieved**
Goals and outcomes were measured through surveys, a basic knowledge quiz on nutrition, and through good old fashion taste testing. All of our students received the Junior Master Gardening Certification in 2014 and 2015. Moreover, 100% of our students and faculty learned how to cultivate a garden, planted seeds, tended to their crops, watched as it grew, harvested the crops, and ate the crops. Students have begun composting their leftover cafeteria food. And 53% of our students report continuing to grow food at home in an area designated for gardening. Keep in mind each year we have a new grade level that accounts for 36 percent of our school’s population that have not completed the program. Nearly all of our returning students created a garden at home.

<table>
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<tr>
<td>Promote outdoor learning experiences (weekly) for 100% of our students</td>
<td>0% of our students received weekly outdoor learning experiences</td>
<td>100% of our students receive weekly outdoor learning experiences</td>
</tr>
<tr>
<td>100 % of our students will grow specialty crops and try them</td>
<td>12 % of our students have grown anything</td>
<td>100 % of our students grew crops</td>
</tr>
<tr>
<td>100 % of our faculty and staff will grow specialty crops</td>
<td>23% of our faculty and staff have grown anything</td>
<td>100% of our faculty have grown specialty crops</td>
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<tr>
<td>100 % of our students will earn a Junior Master Gardening Certificate</td>
<td>0 % of our students had a Junior Master Gardening Certificate</td>
<td>100 % of our students earned a Junior Master Gardening Certificate</td>
</tr>
<tr>
<td>75% of the gardening beds will have specialty crops growing and harvested by the students</td>
<td>20% had specialty crops 2014</td>
<td>80% had specialty crops spring 2015 (blueberries, strawberries, blackberries, etc.) * We added an additional 40 blueberry plants outside of the garden area for 2015 and 2016.</td>
</tr>
<tr>
<td>80 % or more of our students will increase their knowledge on the nutritional value of specialty fruits and vegetables grown</td>
<td>2014 41 %percent average on nutritional value of foods 13% proficiency rate (70% or higher)</td>
<td>2015 82% percent average on nutritional value of foods 93% proficiency rate (70% or higher)</td>
</tr>
<tr>
<td>Increase percentage of students liking fruit and vegetables after growing them</td>
<td>37% of students reported liking vegetables and 87% of students reported liking fruit</td>
<td>After growing fruit and vegetables 74% of students reported liking vegetables and 96% of students reported liking fruit</td>
</tr>
</tbody>
</table>

**Beneficiaries**

While students and faculty are our direct beneficiaries, we have noticed parents and siblings of our students also benefitting from our gardening program. We wanted to utilize our Outdoor Learning Center (Hawks Park) to help bring the community back on campus and regard our school as a vital component of the community. Starting in the summer of 2014, we had moms from neighborhoods around the schools bringing their children and picking our crops for a farm to table dinner experience. Several moms reported that our
crops helped keep something healthy on the table as fruit and vegetables at the store are very expensive. Many came to pick Aloe Vera leaves for sunburns. We have continued the invitation of the community to pick the summer crops due to the participation. Other outcomes achieved that we did not anticipate was the increase in families spending quality family time at the school after hours and on the weekends. Families enjoy the park as they can get free wi-fi. They have initiated park improvements and have formed a community garden club. Additionally, we see an increase in families walking on the track together, playing basketball, and even a drone flying club initiated by the community around our park.

Lessons Learned
The greatest lesson we have learned is in the value of on-going professional development to continue expanding our knowledge so we may share it with our students. The transfer of that knowledge is incredible. Another great lesson we have learned is in the value of maintaining partnerships with the Co-op Extension office and those in the farming industry. We have also learned to test our soil each season and change our soil when needed. It is always wise to reach out to others to show them what you are doing and not to be afraid to get feedback and ask for help! Sustainability is always a process to plan for along with succession training of future leaders of this project to keep it going.

Contact Persons
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Rhonda Tracy- grant 251-221-1485  rtracy@mcpss.com

We have a wealth of photographs via each teacher’s Twitter account and on our schools Twitter @DawesPrincipal
You can also search Twitter with #Dawesome to see our activities around the school daily that include the gardening
Increase Sweet Potatoes Sales

Alabama Sweet Potato Association

Alabama Department of Agriculture and Industries

State Department of Agriculture: Alabama Department of Agriculture & Industries
1445 Federal Drive, Montgomery, AL 36107

State Point of Contact: Johnny Blackmon
USDA AMS Agreement Number: 16SCBGPAL0004

Type of Report: Final Report

Date Submitted: November 29, 2017

Project Title: Increase Alabama Sweet Potatoes Sales

Subgrantee: Alabama Sweet Potato Association (ASPA)
PROJECT SUMMARY

This grant was established on the existing funds from the “Investigating Opportunities for the Sale of Local Specialty Crops in Public Institutions”. The Sweet Potato SCBG had not relation to the previously funded grant. The grant had little time left to complete due to fact that it was a 2014 grant but the grantee was able to finish their purpose. It was not built on any previously funded SCBG grant.

The Alabama Sweet Potato Association (ASPA) increased awareness of the specialty crop of Alabama-grown sweet potatoes by creating and implementing an advertising campaign to make Alabama-grown sweet potatoes more visible to wholesalers and the buying public. An outdoor advertising billboard campaign stimulated increased consumer demand for Alabama-grown sweet potatoes. Packaging re-design enhanced brand and origin of produce awareness to distributors and warehouse staff enabling them to quickly identify this Alabama-grown specialty crop.

PROJECT APPROACH

Alabama sweet potato growers are capable of growing enough sweet potatoes to fulfill the purchasing requirements of additional wholesaler distributors, foodservice companies, and grocery distribution centers in the state of Alabama for this specialty crop. This grant also allowed the ASPA to enhance marketing identification of Alabama sweets at the wholesale/distributor level and take advantage of customer preference for ‘local food’ at the retail level. This translated into additional sales of sweet potatoes.

Growers adopted a logo for the Alabama Sweet Potato Association. This logo now appears on a design used in the production of the growers’ packing boxes. The grant funded setup costs associated with the revised printing on boxes and bags. The box design sample is attached. Funding was also available for a stamp for those growers who choose to use one. The Association placed billboards in 2-3 strategic locations promoting the Alabama, locally grown sweet potato to wholesale and retail customers. The billboard design is attached.

GOALS AND OUTCOMES

The project had two goals.

1. Increase sales of Alabama-grown sweet potatoes by increasing Alabama-grown identity in wholesale/distributor pick slots by printing sweet potato boxes and bags with the Alabama Sweet Potato Association logo.
2. Increase awareness and sales of an Alabama grown specialty crop in retail locations by providing billboard advertising targeted to consumers asking them to ask for Alabama-grown sweet potatoes.

In achieving the goals, we expected the following outcomes:

Outcome 1
Specialty crop sales are expected to increase from $4,500,000.00 to $4,740,000.00 and by 1% percent, as a result of the advertising activity and the package redesign which will make it easier for distributors to choose Alabama-grown sweet potatoes.
Baseline wholesale sales for 2016 ($4,500,000.00) were based on an average of $12/bushel (across grades) with a yield of 150 bushels/acre on 2,500 acres a total of $4,500,000 in 2016 sales.

2017 prices are at $11/bushel (across grades) with an estimated yield of 300 bushels/acre on 1,850 acres planted by Association farmers for $6,105,000 total sales.

We met the goal of expanding specialty crop sales with an increase of $1,605,000. The ASPA reports heavy price pressure from North Carolina and Mississippi as they also had higher yields this year. They credit the “local” packaging with maintaining overall pricing and demand as well as premium pricing at the distributor level.

**Outcome 3, Indicator 3.d.**

*This grant is expected to expand sales at grocery stores that already carry this specialty crop by one percent (1%).*

Direct retail sales of Alabama-grown sweet potatoes were only measured by one farmer during the grant timeframe. He reports that his sales for the period covered by the grant funded advertising increased 2% - 5% (depending on outlet) year over year in the area where the digital billboard (see attached) was displayed.

The wholesale distributor we targeted delivers to their grocery stores exclusively. So sales of sweet potatoes at those grocery stores increased from zero to $5,000.00 in the first month.

**Outcome 3, Indicator 4.e.**

*The advertising and marketing funded by this grant is expected to increase the number of new wholesale markets offering sales of the sweet potato specialty crop by at least one (1).*

The association particularly targeted Mitchell Grocery, a wholesale distributor and associated network of stores in the northern part of the state, to expand sales of this specialty crop. This distributor had been using out of state sourced sweet potatoes for decades. They were very resistant to change at a meeting just after the grant was awarded, but indicated they understood the possible advantage of ‘local’ food sources. We began running billboard advertising (see attached) across from their main distribution point in August 2017. In October, after the designs of the new boxes and bags were complete and shown to the sales team and produce buyer, they placed an initial order for 2 pallets (80 boxes) to serve their stores. In November, they placed an 2 orders for 3 pallets each.

We met the goal of increasing sales of the specialty crop by creating demand with billboard advertising and making packaging changes so that distributors, and their end customers could easily identify Alabama grown sweet potatoes.

A second buyer, specifically purchasing Alabama-grown sweet potatoes, now orders approximately 80 cases a week from an association member due to the newly designed packaging.

**Outcome 5, Indicator 3**

*This project will impact 9 specialty crop growers of Alabama sweet potatoes (and other members of the specialty crop supply chain) by increasing revenue by an expected minimum of $240,000.00.*

We met the goal of increased sales of this specialty crop. Wholesaler Mitchell and their retail stores now have Alabama grown sweet potatoes and are increasing volume. The possibility of adding other specialty crops identified as locally grown has increased due to the success of this product. Other Supply chain impact also followed on with the addition of a new buyer due to the Alabama themed designs. The Mobile farmer indicated that he saw increased sweet potato sales at farmer’s markets as well as traditional retail locations.
and local wholesale produce buyers which he attributed to the impact of the digital billboard.

**BENEFICIARIES**
At the beginning of the project, there were nine members of the ASPA, though all Alabama sweet potato growers will benefit from increased awareness of Alabama grown sweet potatoes and are able to purchase the newly designed boxes and bags for their own use, even if they are not members of the Association. A Beginning Farmer, as defined in the RFA, joined the Association and was able to participate in the increased sales with his 2017 sweet potato crop, grown in Jackson County, Alabama. He also has 15 acres of certified organic potatoes that will be marketed as Alabama-grown.

As sales of locally grown sweet potatoes increase, farmers will have more funds to sustain advertising programs for this specialty crop. This project has generated sufficient sales that the ASPA has extended the billboard advertising for another month at the growers’ expense. This project was designed to create a foundational marketing campaign and develop materials for use in this and future campaigns.

**LESSONS LEARNED**
Advertising and attractive packaging promoting Alabama-grown specialty crop items works to increase sales. Grants such as this one that provide help funding with up front costs and paying for someone with expertise to deal with advertisers’ and packaging companies’ requirements. This reduces demands on farmer’s time and removes one of the barriers to farmers becoming better ‘marketers’ of their products.

Even some farmers are willing to change. The farmer who requested a stamp with the logo (requested in the grant funding) because he had always used a stamp on his boxes, changed his mind and is going with the boxes and/or bags designed with the new logo. This left $300 unspent of the grant funds awarded.

**CONTACT PERSON**
Name the Contact Person for the Project: Lee McBride
Telephone Number: 256-990-5115 Email Address: leehomeandfarm@gmail.com
Name of State Department: Alabama Department of Agriculture & Industries
State Point of Contact: Johnny Blackmon, Coordinator
          Specialty Crop Block Grant Program

Grant Agreement Number: 14-SCBGP-AL-0001
Type of Report: Final Performance Report
          Seed to Table Project
          Mobile Housing Board

Report Due: December 15, 2016
Report Submitted By: Marie Mhoon
          Director of Community & Family Empowerment
          Mobile Housing Board
Project Summary
The Seed to Table project of the Mobile Housing Board was designed to introduce low-wealth families to Alabama’s specialty crops. Using a $20,000 Specialty Crop Grant from the Alabama Department of Agriculture & Industries, Mobile Housing Board developed a community garden in Orange Grove Homes, a public housing development serving nearly 250 families. The garden is adjacent to The Downtown Renaissance, a public housing development that serves 88 senior residents, The Renaissance serving 87 families and Renaissance Gardens serving 48 families. These four (4) housing developments are located on the perimeter of downtown Mobile. A variety of fruits and vegetables were grown in the community garden. Seed to Table produce was marketed to several restaurants in the downtown area. Gardeners also shared crops with their with neighbors. Cooking classes were held to demonstrate ways to cook the vegetables that families had never or rarely eaten. This project built on an earlier grant undertaken with the Mobile Botanical Gardens in 2013. The first year’s program was a major success in building participation from a number of families in the gardening process. There were three areas of success:

1. Responses to our program showed the program not only increased interest in gardening, but also increased interest among participants in consuming more vegetables, and trying new vegetables. This interest grew even among participants who showed only moderate interest in gardening, and didn’t spend much time tending their gardening plots. Simply becoming aware of how food was grown, and where it came from, and seeing others interested in consuming those vegetables seemed to be sufficient to cause many occasional participants to rethink their menus.

2. The garden became a social center where older residents met frequently and talked, and interacted with younger families and children. The garden created an opportunity for community interaction that had not existed before.

3. Some participants were by the end of the year showing considerable skill at gardening, and were interested in expanded gardening opportunities. We were honestly surprised at how much interested had developed among seven or eight of the participants.

We had hoped to continue the program with local support, but promised funding from one of the community organizations did not materialize, and we had a brief hiatus before pursuing a second grant through USDA starting in late 2014.

This new grant was designed to maintain the general interest of the casual participants, while providing serious gardeners expanded opportunities. So we
developed a program where the experienced gardeners would play a larger role in guiding and directing local families who wanted to participate. At the same time, the experienced gardeners would work directly with local restaurants to provide some produce for the market. This turned out to be a highly successful model, resulting in frequent publicity for the program in local TV, radio and print, and many bushels of vegetables delivered not only to local residents but also to local restaurants.

Project Approach

A local horticulturist, Bill Finch, helped Mobile Housing launch the Seed to Table project. Finch provided advice on crops that would grow best in the garden for each season, and he trained families to cultivate their plots in the garden. Gardening was a new and exciting experience for many of the families, including both adults and children.

Initially, when the project was developed in 2013, a number of volunteers were available through the Mobile Botanical Gardens, where Bill Finch was director at the time. Bill was instrumental in designing the program and the garden, and in actively building the beds. But as the Mobile Botanical Garden board decided they could not support the project in early 2014 due to insufficient funding, Bill continued to volunteer his time – often many hours each week -- to keep the project going. Bill later helped design a new grant program, was instrumental in developing relationships with restaurants, in expanding the garden, and in developing most or all of the media exposure. He continued to work with the program long after funding for a horticulturist had been exhausted, and volunteered at least twice as much time as he was paid for. The flaw of the program is that we were unsuccessful in recruiting other volunteer horticulturists who could replace Bill once he had to move on to projects in other cities.

The project required five types of activities.

Developing gardening was obviously central to the project. This garden was actually developed on what was literally an old road bed on the edge of a swamp, in what seemed to be exceedingly inhospitable conditions. Much of the activity of gardening consisted of restoring this soil, which was done by rebuilding the organic content with copious quantities of pine park, leaf mold, manure and other organic materials. This had several benefits: It raised the soil level, increased rooting room, reducing wetness, dramatically increasing oxygen availability to the roots, and buffering the soil against drought conditions. When properly applied, the organic matter could also help to control the aggressive weeds on the site. It also reduced the need for additional fertilizers and amendments. In a subtropical environment like Mobile, where organic matter is rapidly lost from the soil, soil building is a constant part of maintaining a garden. Finding and planting seed and harvesting for resident consumption and for local restaurants were constant activities, usually requiring some on-site activity from the leaders 4 or 5 days a week. In winter, blankets were used to prevent hard freeze damage. Watering was
a frequent activity during dry spells. Results: Ultimately, the tilth of the soil on site became exceptional, and was easy for gardeners to handle with few tools. We recommend that gardeners with small plots focus their efforts and funding on building good soil architecture through use of organic matter, rather than spending money in industrial techniques like plastic culture and frequent tillage and herbicide use.

Developing an interest among the residents was another major task. This required Finch and other volunteers to meet with residents multiple times in assemblies to describe to them the benefits of participating in the garden. We tried to encourage participation in many ways, including cooking vegetables from the garden and holding cooking classes on campus, and providing the cooked food to area residents. Because of high turnover in the housing, recruiting new participants was a constant part of the program. Eventually, the garden leaders among the residents took on the task of seeking new participants. While long-term participation among young families (who have many demands on their time) fell short of our hopes, we did succeed to raising the interest of a large number of residents in gardening and in eating more vegetables. Future programs will need to recognize how limited time is for young families, and pair interested seniors directly with young families to help promote continued participation.

Teaching participants how to garden was obviously key to the program. In the end, this was primarily Bill Finch’s regular task, but he was able to occasionally bring in other experts, including John Olive from Auburn University. Future programs will need to accommodate more voluntary teachers, or include more money for experienced horticulturists who can teach.

Promoting the gardening program on local media was another major task. This too was driven by Bill Finch, with volunteer assistance from WKRG weatherman John Nodar. As noted, the program was frequently featured on television, radio and in print, exceeding expectations and grant deliverables.

Working with local restaurants to provide fresh vegetables from the garden was the fifth major task. This part of the program was one of our biggest successes. Demand for produce was high, and restaurants were eager to participate. The garden leaders were able to deliver a large quantity of produce to the restaurants two or three times each week. Restaurant owners were so taken with the program, they volunteered their time and staff to help develop the garden, and agreed to buy seed and fertilizer to keep the program going.

**Goals and Outcomes**
The ultimate goal of the Seed to Table project were to teach low-wealth families how to grow their own fresh fruits and vegetables, thereby increasing the nutritional value of their meals and ultimately enhancing their overall health. We succeeded in reconnecting households with traditional vegetable consumption patterns. At the beginning of the project, a larger percentage of the plots in the garden were designated for families with children in the household. These families found it difficult to fit gardening into their busy schedules and relinquished their community garden plots to seniors with more leisure time. Seniors in particular have thoroughly enjoyed gardening and sharing the fruits of their labor with their neighbors. There are 20
plots in the garden. Approximately 30 families have participated in the project since MHB received the Specialty Crop Block Grant. Our goal was to have a minimum of 25 participating households, or 50 family members.

**Goals and Outcomes (continued)**

Another goal of the Seed to Table project was to sell produce to at least three (3) local restaurants to sustain the community garden. We achieved this goal, and proceeds from the sale of fruits and vegetables were to be used to purchase seeds, supplies and equipment for the garden. Rather than sell items to the restaurants, however, produce was exchanged for supplies because Mobile Housing Board was not prepared to handle retail sales. Equipment, seeds, and fertilizer were donated occasionally, and a group of volunteers built a storage shed in the garden. Also, beyond the hours he was paid as a consultant, Horticulturist Bill Finch volunteered many hours of his time to ensure the success of the Seed to Table project.

We did include 25 households in the program within the 12 to 14 months of the grant. Because of the nature of the residences, there was high turnover among some participants. But we did not expect a 100% “graduation” rate. The idea was to expose as many families as possible to the gardening program.

We conducted a number of surveys asking participants whether they were consuming more vegetables. Because of turnover, it was sometimes impossible to track all participants with pre- and post-surveys. But among those who stuck with the program, almost all indicated that the program had resulted in increased interest in consuming vegetables, and increased interest in eating a wider variety of vegetables.

We did succeed in securing arrangements for vegetable deliveries to two local restaurants, the Washhouse in Fairhope and Noble South in Mobile. These deliveries continued for more than a year, and eventually, one of the restaurant owners began bringing his staff to the garden regularly to work with the resident gardeners. Deliveries of kale, okra, broccoli, okra, peppers, beans, peas and eggplant were particularly popular with the local restaurants. Securing a third arrangement didn't seem wise, as the produce was in high demand at the two restaurants we were working with, and we did not believe we would have the space, the time and the hands to deliver to another restaurant. Support from the restaurants in terms of buying seeds, fertilizers, soil amendments and providing labor and supervision was more valuable than the market value of the vegetables, so we did not try to enter into a formal contract. The local restaurants agreed to continue working with the program — buying seed and fertilizer and plants—which could make the program self sufficient. But continuation of the program will hinge on finding a horticulturist and organizer who can replace the role of horticulturist Bill Finch.

We did successfully train 10 garden leaders, but in the end, only four demonstrated the skill and the focus to train others in the program. These four leaders were instrumental in keeping the local program going from 2013 through 2017. But without the additional garden leaders, we were not able to meet our goal of impacting 250 families.
The local CBS affiliate ran at least a dozen segments featuring the Seed to Table garden. The Seed to Table garden was featured frequently on the Plain Gardening radio program on the FM 106.5 talk radio station. More than 15 articles in the local newspaper featured or mentioned some aspect of the Seed to Table program, and included many photos of the site. A Facebook page was also launched and maintained. Many of these articles and links to the TV coverage were included in earlier reports.

**Beneficiaries**
Undoubtedly, the beneficiaries of the Seed to Table project are residents of Mobile Housing Board, the City of Mobile’s public housing authority. All 88 residents of the Downtown Renaissance housing development for seniors received fresh fruits and vegetables from the garden. There are nearly 400 other households within three (3) other public housing developments located in close proximity of the community garden. Many of these residents also received vegetables and fruits from the garden. More importantly, approximately 30 families seized the opportunity to learn to grow their own produce. Moreover, during the grant term, five (5) different residents received monthly stipends for their role as “Guardians of the Garden.” They trained others to cultivate their plots and cared for unattended plots. Working closely with the horticulturist, they learned about gardening, learned how to train others to be gardeners, and developed their leadership skills in the process.

**Lessons Learned**
One of the most interesting and unexpected results was the fact that the garden became a social center for the area, a place where young kids and young mothers and fathers stopped by to see what senior residents were growing in the garden. Even when there wasn’t direct participation in the garden, these families became regular visitors, and learned quite a bit about gardening and about the use of vegetables. Just as important, it promoted frequent beneficial interaction between community role models and young kids and families.

Because of the activities of horticulturist Bill Finch, there was frequent supervision on site, and staff members frequently stopped by to look into what was happening and try to understand what was going on site. But because no staff member was directly involved in or familiar with the horticultural aspects of the project, it made it difficult to maintain the program when Finch was not able to volunteer more of his time.

Mobile Housing Board relied heavily on Horticulturist Bill Finch for his expertise and ability to train residents to manage the Seed to Table project. A staff person was assigned to assist with the project. In hindsight, we should have identified and assigned a staff member who enjoys gardening.

**Contact Person**
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**Additional Information**
It rarely snows in Mobile, Alabama. When it does snow, it typically occurs in January or February. It snowed lightly in Mobile on December 8, 2017. The beautiful photos below show collards growing and thriving in the community garden.

Pictures on next page.
Title: Enhancing greenhouse lettuce production through non-traditional heating and cooling systems

Project Coordinator: Jeremy Pickens

Co PI’s: Daniel Wells, Jeff Sibley, and James Spiers

Affiliation: Auburn University

Primary Contact: Jeremy Pickens pickejm@auburn.edu (334) 319-3829

Project Summary

This project involves evaluating alternative methods to heat and cool water in the production of hydroponic greenhouse lettuce. Energy can account for 30% of production cost of greenhouse lettuce. This project looks to reduce energy needs through alternative heating and cooling systems. This project was initiated due to grower needs and interest.

Definitions

NFT = Nutrient Film Technique. This is a culture system in which plants are grown in a series of PVC gutters. See figure 3 and 4 for an example.

DWC = Deep Water Culture. DWC involves growing plants on top of foam rafts where the roots grow into a nutrient solution.

Activities Performed

Quarter 1

We ran 6 lettuce trials in Quarter one. Two were in an unheated greenhouse at the Ornamental Horticulture Research Center in Mobile, AL and four took place at the Patterson Greenhouse Complex at Auburn University. These trials overlapped one another with each lasting an average of 30 days (Figure 1). We presented our findings at the Mobile County Fruit and Vegetable Growers Meeting with 20 growers were in attendance.

Quarter 2

Temperatures did not permit any experiments with heating the water in Quarter 2. We began sourcing materials to construct an NFT system to be used with water chilling trials for Quarter 3.

Quarter 3

In Quarter 3, we were able to present a poster at the Southern Region American Society for Horticulture Science. Like the previous year, we were unable to find a way to chill the water for a chilling experiment using a deep water hydroponic system. The cost to install the system would have been too great and the technical problems we were having were too great to overcome. Instead, we designed a system to chill the water for Nutrient Film Technique (NFT) grown lettuce. We developed two systems and installed one at the Ornamental Horticulture Research Station in Mobile and one at the Patterson Greenhouse Complex at Auburn University (Figure 2 and 3). This additional experiment was not in the budget and we used our own research funds to cover the cost. The cost was estimated to be $4,000. Unfortunately by the time we got the system working properly the weather began to cool. We were able to present this project to over 100 individuals through 2 field days at the OHRC in Quarter 3 (Figure 4).

Quarter 4

In Quarter 4, we expanded the heating experiment to include NFT. Most of the commercial growers in the southern part of the state utilize NFT (Figure 5). These growers are very excited about this research. We are also repeating the heating trials in DWC systems at Auburn during Quarter 4. By the end of Quarter 1, 2017 we should have enough data to give good recommendations on heating the nutrient solution for both NFT and DWC.
Problem and Delays
We are still delayed in evaluating chilling the water due to technical difficulties, however we are confident that we have these problems solved and will be able to test water chilling in Quarter 2 and 3 of 2017. To make the most of our resources we have expanded the project to cover heating nutrient solution for NFT systems. In order to complete the portion of this project involving water chilling we are requesting to extend the project to Quarter 3, 2017. This extension will also allow us to present this information to a greater audience.

Future Plans
Over the next reporting period we will continue to conduct experiments to further validate our work and to determine optimum heating and chilling temperatures. We will present our findings at two to three grower meetings in 2017 and develop a fact sheet highlighting the benefits of this culture technique.

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter 1</td>
<td>Conduct lettuce heating trial with new NFT system in conjunction with DWC system. Present information at the MCFVG meeting in February. Develop web based Extension fact sheet and webinar highlighting project.</td>
</tr>
<tr>
<td>Quarter 2</td>
<td>Conduct water chilling study.</td>
</tr>
<tr>
<td>Quarter 3</td>
<td>Conduct water chilling study and present results at the Alabama Fruit and Vegetable Growers Conference.</td>
</tr>
</tbody>
</table>

Funding Expended to Date
We have expended all of our funding to date and we have purchased all the necessary supplies to complete this project. Any further expense in materials or labor involving this project will be covered by our own funds. We applied for and granted a SCBG for 2017 where we will have funding to do trials at two commercial farms. We also received $2800 from a competitive internal grant to continue our work.

Figure 5 Quarter 1 lettuce DWC lettuce Heating Trial
Figure 6. Dr. Pickens, Dr. Wells, and Dr. Monday constructed the NFT system in Mobile.

Figure 7. Quarter 4 NFT water heating study.
Figure 4. Dr. Pickens and Dr. Wells presenting the project at OHRC Field Day in Quarter 3

Figure 8. Commercial NFT lettuce operation in South Alabama.
Trinity Garden Levonees Fisher
Bay Area Women Coalition, Incorporated
Trinity Gardens Community Gardens
Final Report

Project site: 1500 Jessie Street Mobile, AL 36617
USDA-AMS Award#: 14-SCBGB-AL-0001
State Contact: Johnny Blackmon
Recipient: Bay Area Women Coalition, Inc  
Grant Agreement: $23,310.00  
Due Date: October 1, 2014 - September 29, 2017  
Program Name: Trinity Community Gardens  
AGREEMENT NUMBER: USDA-AMS Award#: 14-SCBGB-AL-0001

Project Summary
The grantee provided background for the initial purpose of the project which includes the specific issue, problem/need of residents living in a low wealth community with little or no access to fresh fruits, vegetables, and nuts. Trinity Gardens Community Gardens (TGCG) was a three year project of Bay Area Women Coalition (BAWC) is a 501(c) (3) non-profit organization (FEIN 63-1195628) and Alabama ID# 0000397896 organized in 1997 and located within the community. This project motivated the organization to purchase blighted property from the city of Mobile and plant seeds of hope for the residents. This project offered opportunities for community youths, leaders, churches, businesses, and schools to develop and maintain a community garden while providing a significant source of food and income.

Project Approach
The activities and tasks during the entire grant period were briefly summarized. The work plan of the approved project included significant results, accomplishments, conclusions and recommendations, as well as favorable and the unusual development. The purpose of this project was to build community gardens that would increase access to nutritious fruits, vegetables and nuts in a low wealth community- Trinity Gardens located in the City of Mobile, Alabama. The city sold a one acre tax delinquent lot to BAWC for four hundred dollars ($400.00). The city of Mobile assisted with clearing the blighted property in preparation of the community garden. More than 20 tandem trucks loads of trash was removed.

WORK PLAN - ELEMENT I  Community involvement and partnerships
Partnerships with three community churches which were primarily responsible for gardening, managing and day-to-day operations of the community gardens: 1) Rev. Scott Moore of Trinity Family Church, 2) Rev. William Carey of Mt Zion #2 Baptist Church, 3) Rev. Ulmer Marshall of Trinity Lutheran Church & School. Partnership with the city of Mobile.

WORK PLAN ELEMENT II   Public schools involvement
There were only two schools within Trinity Gardens: Brazier Elementary, Trinity Lutheran which consistently participated. Youths gardening activities: 1) Planting backyard/front yard garden and 2) A community garden. Youths were given seeds and planters to take home to begin planting their own gardens and encouraged to start a “gardening Club” at their school.

WORK PLAN ELEMENT III Schedules and Community Gardens/Expansion Plans
The community garden appealed to a variety of residents which involved various workshop and seminars for children, youths, and adults. Workshops offered by the State Agricultural Department explaining SNAP and other opportunities were attended with follow-up.

Goals and Outcomes Achieved
**Comments**

**Expected Measureable objectives**-

**Goal #1:** Establish a baseline indicator of consumer knowledge of specialty crops and their nutritional values for Trinity Gardens’ residents living in the City of Mobile, Alabama.

Baseline: To be determined. RESULT: We assumed the baseline would be zero.

Target: Increase consumer knowledge by 5% in 2015. RESULT: This was achieved.

Performance Measure: Data collected from pre, mid, and post surveys.

**RESULTS**

1). Increase consumer knowledge 100 percent in years 2015-2017. Fifty residents: Pre-surveys (2015): More than fifty (50) residents completed the original survey (2015) and no one knew the terms “Specialty Crop”.

2) Mid-term surveys (2016) almost all residents had some knowledge of community gardening and the original fifty knew the term “Specialty Crop”.

3) Post-survey results: More than fifty (50) people completed the post-survey and all knew the term specialty crop, the purpose of the community garden, and various types of specialty crop being grown.

**Goal #2:** Identify the economic impact and benefits of supporting Alabama specialty crops within a low wealth community.

Baseline: 0

Target: 2015: 5%

Performance Measure:

RESULTS: More than 3,000 residents were impacted during the 3 year period.

More than five hundred flyers distributed each year (2015-2017) through the community through flyers, PTA meetings at schools and churches bulletins. Over the three year period more than 3,000 flyers distributed directly and indirectly.

RESULTS

Thirteen gardens have been planted throughout this community from 2015-2017. Residents of various ages and professional backgrounds have consistently participated and attended monthly gardening workshops.

**Goal #3:** Improve knowledge of making healthy nutritional choices with adults and school age youths.

Baseline: 0

Target: 2015: 5%

Performance Measure: Number of adults and school age youths participating in Specialty crops gardening seminars and workshops.

RESULTS

Two elementary schools participated every year: Brazier Elementary School and Trinity Lutheran School. Brazier Elementary School had more than 280 children each year (2015-2017) participating and Trinity Lutheran School had more than 100 children (2015-2017) each year. The parents, faculty, and staff also participated. There were competitions and opportunities to “show off” their gardening skills each year. Youths were hired from Brazier Elementary School and Trinity Lutheran School to plant and harvest special crops fruits and vegetables.

**Goal #4** Improve public awareness of locally known Specialty Crops in Mobile, Alabama

Baseline: 0

Target: 2015: 5%

Performance Measure: Distributed flyers to all Radio/TV advertisement, Social media, a variety of publications were distributed throughout the City of Mobile and surrounding municipalities.

RESULTS

Articles appeared on social media. One participating community newspaper (Mobile Beacon) gave great accolades to children, faculty, staff, and parents participating in this community garden with an exciting newspaper article. Social media reached out to thousands of readers during our hiring
of children and during our harvesting of fruits and vegetables. Achieve Magazine (Amway) featured one of our volunteers in full color and donated $500.00 to our organization. Men and women owning heavy equipment volunteered their time and equipment to tilling the soil. Corporations donated topsoil. Local Alabama Farmers donated plants and advice.

Goal #5. Improve consumer knowledge of production and preparation of Alabama Specialty Crops.
Baseline: 0
Target: 2015: 5%
Performance Measure: Number of Specialty Crop backyard gardens planted in the targeted community by adults and youths. The number of “Specialty Crop backyard gardens” planted from 2015 through 2017 grew from one large community gardens to 25 front yard and backyard residential gardens.

**Beneficiaries**

**Comments**
The grantee provide a description of the groups and operations that benefitted from the completion of this project’s accomplishments i.e. more than 500 youths, and the hundreds of participants in the workshops.

**Lessons Learn**

- Did the grantee offer insight into the lessons learned by the project staff as a result of completing this project?
- Did the grantee provide any unexpected outcomes or results that were an effect of implementing this project?
- If goals or outcome measure were not achieved, did the grantee identify and share the lessons learned to help others expedite problem-solving?

**Comments**
The grantee offer insight into the lessons learned by the project staff such as residents signing a petition to stop the community garden. From the beginning of this project, we experience opposition from the residents. During the initial location of the garden, we were given permission by the City of Mobile to use the blighted property for the community gardens and given the assurance that the city of Mobile would help us remove all debris (27 tandem trucks of debris).

HOWEVER, we never advertised to the community (residents) that we were cleaning up and clearing the property for a community gardens (lesson Learned). If we had only advertised or walked the streets and passed out flyers the opposition (residents) would have welcomed this garden.

We actually used 19 prisoners to clear the property which the residents had great resentment. They assumed the city of Mobile was clearing the property with inmates. This presented much mental discomfort.

Twenty-five (25) residents signed a petition and presented it to the city of Mobile councilman Fred Richardson and made demands to stop cleaning and clearing the property.

In addition, we actually went door to door (visited all 25 residents who signed the petition) and explain what our intentions were for this one acre everything went smooth afterwards. Lesson learned advertise what’s going to happen before it happens.
The seasons of extreme heat, season of extreme cold weather, and the season of extreme rain and flood.

Project Commitment exceeded expectations:

*Specialty crop Stakeholder #1:* Pastors and Churches supported this project. *Specialty crop Stakeholder #2:* The City of Mobile supported this project because it addressed issues: 1) blighted lots and dilapidated houses and 2) major and minor crimes. Crime rate decreased on streets with gardens. A police officer was assigned to participate in our monthly workshops and give updates of crime.

*Specialty crop Stakeholder #3:* Master gardeners- Six initially identified more than fifteen participated in this project. Gardeners from other communities joined our efforts.

*Specialty crop Stakeholder #4:* Three Public Schools administrators from Brazier, Chastang & Blount used gardening as a school project.

*Specialty crop Stakeholder #5:* The Alabama Department of Agriculture and Industries master gardeners assisted during the entire grant period in designing and monitoring the community gardens.

**Contact Person**

Leevones Fisher
251-379-3497  email address leevonesfisher@att.net
Final Report

Report submitted by: Alice Evans, Exec. Director, Alabama Sustainable Agriculture Network
Reporting Period: 12/1/2014 – 12/1/2015
Grant Agreement Number: 14-SCBGP-AL-0001

Project title:
Promoting Competitiveness of Specialty Crop Industry in Alabama through Intensive Grower Training and Resource Development

Project summary:
This proposal was submitted by the Alabama Sustainable Agriculture Network (ASAN) – a statewide small producer organization dedicated to supporting conservation practices and maintaining healthy communities. The purpose was informed by a needs survey conducted by ASAN in 2013, which identified an urgent and widespread need for more training and networking opportunities for farmers (especially new and beginning farmers), and more opportunities for training and technical assistance around sustainable production of specialty crops.

The purpose of this project was to directly benefit specialty crop producers in Alabama resulting in increased competitiveness and success of local crop production and food systems. The areas of emphasis for this proposal are:

- Sustainability of specialty crop production
- Pest and disease control

The overall aim of this proposal was to increase competitiveness of Alabama specialty crops by reducing cost of production through development of urgently needed training manuals and resources that will benefit producers beyond the lifecycle of this grant. Therefore, our goals are long-term and deeply impacting although the timeline appears to define short-term activities.

Project approach:
ASAN took a two-pronged approach to this project: 1) holding training and networking events for small producers and limited-resource farmers, and 2) developing and disseminating educational resources in print and digital formats.

1) Objective 1 (2015-2016). Develop training program (regional farm forums) for small producers and low resource farmers.

ACTIVITIES:
- **Training events:** The Alabama Sustainable Agriculture Network organized four Regional Food & Farm Forums on November 10, 2014, and October 13, October 29, November 17, and December 2, 2015. Attendance at each was 80, 62, 35, 60, and 75 participants respectively. Each of these Regional Forums consisted of a wide variety of educational roundtable discussions, as well as an assortment of farm tours, mini-workshops, exhibits, and “lightning rounds” to inform participants of available resources. These events were promoted primarily to aspiring, beginning, and experienced farmers, and secondarily to agricultural professionals and other resource personnel, nonprofit representatives, food-
and ag-based businesses, community leaders, home gardeners, farmers market managers, and others.

Roundtable discussion topics included: Selecting, starting, and raising superior fruit and nut trees in the Deep South; Seed saving; High tunnel production; Startup farm business planning; Cover crops, crop rotation, and soil fertility; The what, why, and how of water quality; Organic certification; Compost; Mushrooms; Hydroponics and aquaponics; The Food Safety Modernization Act (FSMA) and you; Access to capital; Food hubs; Value added products and cottage foods; Building strong farm-to-restaurant relationships; Cut flowers; and more.

Partners included: NRCS, Southern Sustainable Agriculture Working Group (SSAWG), National Center for Appropriate Technology (NCAT), Alabama Rivers Alliance, Alabama Association of RC&D Councils, North Alabama Revolving Loan Fund, First South Farm Credit, Alabama Ag Credit, Tuskegee University, Society of St. Andrew, Bay Area Food Bank, MightyGrow Organics, Deep South Food Alliance, and many others.

Full agendas from all 5 of these events are attached.

ASAN hosted 4 additional Regional Food & Farm Forums in fall of 2016, in Poarch, AL (in conjunction with the Poarch Band of Creek Indians – 58 participants); Childersburg, AL (41 participants); Nauvoo, AL (in conjunction with McDowell Farm School at Camp McDowell, and the Sierra Club of Alabama – 82 participants); and Livingston, AL (in conjunction with the University of West Alabama – 47 participants).

In addition to ASAN-led events, the Alabama Extension Commercial Horticulture Team completed the following activities that benefited specialty crop producers statewide: 2 high tunnel crop production workshops (57 participants), 2 organic/small farm events (44 participants), 2 greenhouse crops workshops (35 participants), 4 other workshops (135 participants), and 2 IPM field days (77 participants) where organic / sustainable vegetable production practices was the central theme. Dr. Majumdar also organized two in-service training events (40 participants) for Extension Agents to discuss issues regarding organic farming systems and distributed publications as teaching material.

- **Technology demonstration plots:** Alabama Extension had three large IPM demonstration plots at the Research and Extension Centers (Clanton, Cullman, and Brewton) to show the effectiveness of trap crops, physical exclusion, and biorational insecticides. Additional on-farm studies are going on in Fairhope, Eufaula, Muscle Shoals, and Thomaston which provide additional peer-to-peer training opportunity to producers, including those in underserved communities and military veterans interested in vegetable production.

**OUTCOMES:**

Evaluations were conducted after each of the Regional Food & Farm Forums. Of those who responded, 66% were farmers (or aspiring farmers), of which nearly 75% had been farming 10 years or less. Nearly 100% of respondents felt that they had a better understanding of the resources available to them in their community as a result of the event, and 100% said they planned to share what they learned with others, once they returned to their job / home / community. Where applicable, 100% plan to implement what they learned in their own farm/garden, and 100% responded that they met someone new with whom they planned to work in the future.

Qualitatively, the Regional Forums reached existing partners and new ones. The Forums were held both in regions where ASAN has a strong following, as well as in regions where we used the Forums as a tool to put down roots in a new area. At certain events arrangements were
made to provide child care and language interpretation, which helped more people to access the resources and the community that the Forums assemble. Furthermore, countless participants shared reflections at the events that as a result of the Regional Forums they felt energized, encouraged, and part of a larger community, which was critical to the future of not only their own particular farming operation, but that of sustainable agriculture in Alabama in general. These qualitative observations point to progress towards our longer-term goals of building a strong, interconnected base of farmers and community members that can support a growing local food economy and increase consumer awareness of and support for buying locally grown specialty crops.

Progress can also be charted in terms of a growing support for the Regional Food & Farm Forums series, and continued trends of increased attendance and high rates of participant satisfaction.

SUPPLEMENTAL MATERIALS:

Regional Food & Farm Forum, November 10, 2014:

Regional Food & Farm Forum, October 13, 2015:
Regional Food & Farm Forum, October 29, 2015:

Regional Food & Farm Forum, November 17, 2015:

Regional Food & Farm Forum, December 2, 2015:
Agendas for all 5 events are attached.

2) Objective 2 (2015-2016). Develop new producer handbook in print and online training modules for small farms.

**ACTIVITIES:**

- **High Tunnel Handbook:** Alabama Extension in partnership with ASAN has published the High Tunnel Crop Production Handbook in two versions: Printed and iBook with embedded videos and live links to more information. Through this grant, 300 copies of the book have been printed and distributed to producers. Additional copies have been made available to NRCS, FSA and other state agencies. Alabama Extension Commercial Horticulture program is collaborating with NRCS to training field agents and producers across the state. Two additional IPM training modules and six videos have also been developed and posted on the Alabama Vegetable IPM website (www.aces.edu/vegetableipm).

- **ASAN communications and website upgrades:** ASAN updated its website in early 2015, and it is now built on a much more versatile platform for integration with video sites, social media sites, and mobile sites. These upgrades will help tremendously as more and more
farmers, especially those in rural areas which often lack reliable internet service, are accessing online resources via mobile devices.

ASAN published four issues of its quarterly print newsletter, which is also distributed electronically via Facebook and email listserves. Each of these issues features a number of articles on specialty crop production and marketing. Additionally, thanks to website upgrades, a copy of each issue is archived on ASAN’s website, and so can be accessed by those who are new to, or not included in, our email database. These archives can be accessed at http://asanonline.org/archived-newsletters/. Lastly, ASAN delivered monthly email newsletters to a growing database of producers and supporters around the state, each one including upcoming events, job postings, and other timely news and resources. ASAN saw its email database grow by 23% from November 2014 to November 2015.

ASAN’s Facebook page saw a 43% increase in page followers in the same time period.

- **Other Publications:** ASAN also published an updated edition of its Small Farms Resource Guide, a comprehensive directory of resources for small and beginning farmers in Alabama, which was distributed in print to 200 between July and December 2015. ACES published a field guide to insect control in cole crops (ANR-2241) for further assistance to small producers. The Alternative Vegetable IPM Slide Chart was also distributed free to the producers via the ASAN and Extension events as a critical resource for new and experienced producers. New IPM training modules related to organic squash production and high tunnel pest exclusion system have been made available on the Alabama Vegetable IPM website (www.aces.edu/vegetableipm). A total of 6 videos have been released in 2015 to benefit producers, including videos on grower testimonials to encourage peer-to-peer learning. We also produced 15 issues of the Alabama IPM newsletter that reaches to nearly 2,100 subscribers that include farmers, educators, industry personnel, nonprofit agencies, and government officials. About 14 vegetable IPM articles have been published and archived online at www.aces.edu/ipmcommunicator. In 2015, this newsletter and the IPM slide chart received the Blue Ribbon Communication Award from the American Society of Horticultural Science and two communication awards the National Association of County Agricultural Agents. In addition, six magazine/newspaper articles and 9 Extension news releases were also published by Dr. Majumdar to raise awareness about this project.

**OUTCOMES**

The online and printed educational materials developed by ASAN and ACES are incredibly popular not only within the state, but regionally in the southeast. The IPM website and associated training modules are very popular ways of learning since many producers use mobile devices to access technical information. The IPM videos (new and older videos, about 9 total) have gotten over 4,100 views. The Alabama IPM Communicator and other news releases have been utilized to disseminate information about the handbook. There are two impact videos of educational activities and past publications available at www.aces.edu/vegetableipm; ACES is in the process of documenting impacts of this grant.
**Beneficiaries:**
Specific metrics are included above, regarding the number or type of beneficiaries of each part of the larger project. Generally, the primary audience included small-scale producers throughout Alabama, including limited resource farmers, direct-market farmers, high tunnel producers, new and beginning farmers, aspiring farmers / farm employees, and others. Secondary audience for this work included agricultural support personnel and other “trainers”, whose increased awareness of available resources and community-based expertise – via referrals, recommendations, and knowledge transfer -- benefits an even wider base of producers outside the context of these specific project-based events and publications.

**Lessons Learned:**
ASAN has enshrined network-building and peer-to-peer education in its programming since our founding, and time and time again we have seen that the peer-to-peer approach works best: farmers are much more likely to adopt and implement new techniques, methods, and resources when they learn from other farmers and when they are able to learn and experience and understand it in a whole-farm context. Also, this method allows for more than a single point of interaction – to learn a new method for pest and disease control, for instance, a farmer doesn’t need to rely on absorbing 100% of the knowledge in one sitting, but rather, can go home and try it out, and reach out to the person with follow-up questions, or for “troubleshooting.” However the challenge with this approach is that measurement and evaluation are difficult, as they are embedded in the development of personal relationships. We measure our success through participants’ self-reporting about whether they met someone they plan to work with in the future, and indirectly through repeat attendance (which indicates both satisfaction with previous events as well as a desire and need for follow-up interactions), but are working to develop more quantifiable ways to track this type of work.

**Contact person:**
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The Master’s Garden in Montgomery’s Chisholm Community
First Baptist Church Community Ministries

PROJECT SUMMARY

The Master’s Garden in Montgomery’s Chisholm Community was established to provide a 2 ½ acre faith based garden focused on improving the quality of lives in an impoverished community. Chisholm suffers from poverty, crime and lack of community. Mixed cultures inhabit a “working poor” Chisholm Community. With the monetary contribution of the 2014 USDA Specialty Crops Grant the community garden has provided an oasis for residents by providing nutritious fruits and vegetables and beautifying the neighborhood. Gardening families have experienced lower family food budgets and a sense of self-reliance while enjoying a feeling of togetherness with fellow community members through cross cultural connections. The community of Chisholm has been strengthened through The Master’s Garden with resident’s seeing an improvement in the quality of life.

PROJECT APPROACH

With the monetary contribution of the 2014 USDA Specialty Crops Grant a community garden in the Chisholm area in Montgomery called The Master’s Garden became a reality in spring, 2015. As per grant goals, as established by The Master’s Garden Steering Committee, the two acre site was cleared and fencing was erected. Volunteers from First Baptist Church not only erected the fence, but installed an extensive irrigation system. Plastic culture was laid in the communal garden and for the first planting season, 30 families applied for
individual family plots. Rosebushes, blueberry bushes and wildflowers were planted to border the garden per the proposed 2014 grant work plan.

Gravel was purchased by the 2014 USDA Specialty Crop Grant and spread by volunteers from Caddell Construction Co., a garden partner, down rows established between the gardening plots. Soil, also provided by the 2014 USDA Grant, was delivered and added to needed areas of the garden.

A garden steward was hired to oversee the community garden from April-November, 6 days a week, 4 hours a day, from 8:00am – 12:00 noon. The steward’s responsibilities have included operation and maintenance of the irrigation system, working with garden participants, garden plot preparation, checking in and out of garden tools, etc. In 2017, with the garden running smoothly, the garden steward’s work days were reduced to 4 days a week.

Start-up costs requested under the 2014 grant included two tillers along with fuel to run the equipment. The garden tillers and fuel were purchased along with fertilizer, chemicals and small garden tools.

With increasing community enthusiasm the garden has seen much success since the first planting in spring, 2015. Returning families are eager each year to claim their plots while new gardening families arrive hoping to join the community garden effort in Chisholm in order to grow their own nutritious vegetables. This past year saw the expansion of gardening plots to 47 with each prepared plot claimed as the garden opened for spring planting. Gardening families are welcomed to the garden each opening day, oriented on procedures and rules, sign a gardening plot agreement form and collect provided vegetable plants and seeds.

With the assistance of Harold McLemore, Alabama State Department of Agriculture, as many as ten 150ft rows of plastic culture has been laid each year, 2015-to present, in the communal garden. Spring and fall crops planted in the gardener’s plots and the communal garden have included: corn, tomatoes, beans, peas, squash, watermelons and several varieties of peppers. Also planted were cantaloupe, green onions, okra, running okra, sweet potatoes and cucumbers. Fall Crops included collards, broccoli, cauliflower, cabbage, kale, lettuce and turnips. Herbs, such as basil and cilantro, were planted in gardener’s plots as well as the communal garden. Beds of sunflowers, wild flowers, and backberry bushes were added to the garden site. In 2015, the garden produced 3700 lbs. of vegetables with this amount increasing each year. The 2017 harvest totaled over 7000 lbs of nutritious fruits and vegetables.
Commercial strawberry plants were added to the garden in October, 2016, with the purpose of establishing a partnership with area schools as stated in the 2014 work plan. Field trips to pick from the garden’s 1000 commercial strawberry plants began on April 18, 2017 and continued through the first week in May. First Baptist Church volunteers hosted kindergarteners and second- graders from Highland Garden Elementary, the Pals Class from Chisholm Elementary, homeschooled children and The Chisholm Girls and Boys Club as they visited the garden. The children picked strawberries, helped to plant corn and beans in the communal garden, participated in a garden scavenger hunt and enjoyed a garden themed snack. The garden boasted a 3000 pound harvest of large, flavorful strawberries from the 1000 commercial plants. The children from First Baptist Community Ministries Nehemiah Center, located across the street from the garden, picked strawberries and made strawberry jam as well as strawberry syrup. In October, 2017 volunteers planted 1500 commercial strawberry plants in anticipation of school field trips and other groups visiting the garden beginning in April, 2018.

In June, 2017 five 150ft rows of ornamental pumpkin seeds were planted in plastic culture in the communal garden and invitations were once again extended to kindergarteners, 1st and 2nd graders at Chisholm Elementary and Highland Garden Elementary to visit the garden’s pumpkin patch. In addition, The Girls and Boys Club in Chisholm, preschoolers in the Success by Six programs and First Baptist Church Community Ministries International Ministry were invited to visit the pumpkin patch. The Nehemiah Kids Club and First Baptist Church’s Tutoring Program also enjoyed a fall festival and visit to the pumpkin patch in late October. A total of 475 visited the garden in October to pick pumpkins, go on a hay-ride, plant collards, participate in a scavenger hunt and enjoy a fall, themed snack.

A community partner, Caddell Construction Company, once again returned to the garden to offer an annual day of service in April, 2017. Thirty-three Caddell employees served 4 hour shifts to revamp the garden’s water system, plant 40 blackberry bushes, 15 rosebushes and 12 fruit trees (3 pear, 3 plum, 3 apple and 3 peach trees). Sixty bales of pine straw were spread around fruit trees, blueberry bushes, blackberry bushes, and rosebushes. This valuable community partner trenched and laid pvc pipe to extend the water system, added 4 water faucets and stabilized the existing 25 faucets by attaching the faucets to wooden posts in the ground. Caddell Construction will continue to support the garden and are planning another day of service in the garden in April.

In addition to Caddell Construction, other community partnerships have formed and continue to work together to see that The Master’s Garden is successful in creating a positive experience for its gardening families. Many individuals,
families, First Baptist Sunday School classes and mission groups have participated, provided monetary resources, and given countless hours over the last year in service to the garden. Bonnie Plant Farms, located in Union Springs, Alabama and Green Thumb Nurseries of Montgomery continue to generously donate plants, seeds, hay, etc. The Alabama Cooperative Extension Service through Auburn University provided agents during the summer months to work with the Nehemiah Kids Club. The Alabama State Department of Agriculture and their representative, Harold McLemore, continue to be consistent in providing wise counsel and expertise throughout the grant cycle process. A private donation resulted in the purchase of a 4 X 6’ Norlake Walk-In-Cooler. Adam Luckie, a First Baptist Church Youth member and candidate for Eagle Scout, built and installed playground equipment in the garden made from recycled materials. First Baptist Church members, Johnny and Angie Holleman, purchased and gifted a much needed John Deere Compact Tractor to the garden. Sun South Tractor Company donated a used bush hog as an attachment to the tractor.

A private donation resulted in a 20’ X 40’ foot pole barn being purchased and installed at the garden. This generous addition to the garden was raised prior to the fall school field trips and visits to the pumpkin patch. The pole barn has provided much needed meeting space for gardener meetings and field trips. The pole barn also provides cover for the garden’s equipment container, walk-in cooler, and John Deere tractor. A base of gravel was spread under the 20’ X 40’ pole barn.

The Master’s Garden has seen 3 years of success due to the monetary support of the 2014 USDA Specialty Crops Grant and the hard work of The Master’s Garden Committee and garden volunteers. Community partners and members of First Baptist Church have assisted in the success of the project. One-on-one community relationships have been established with local residents which has encouraged positive community development in Chisholm. Neighborhood collaborations have been established and maintained with area schools, Success by Six, The Boys and Girls Club and The Friendship Mission through the garden. The gardener’s plots and communal garden have produced approximately 14,000 lbs of nutritious produce since spring, 2015. The Friendship Mission in Montgomery, First Baptist Church Food Pantry, The Nehemiah Kids Club, gardening families and the community of Chisholm have shared in the distribution of vegetables and fruits.

**GOALS AND OUTCOMES ACHIEVED**
For the first season of planting (spring, 2015) the goal was to have 30 families participating in the garden project. The number of participants was exceeded and as of spring, 2017, a total of 47 plots were assigned to gardening families. All prepared plots were applied for and assigned while extending the individual gardening plots into the communal garden area. As per the goal and expected outcome the number of families participating in the garden project has increased each year.

Each gardening family becomes a member of The Master’s Garden Club and abides by the policies and procedures adopted by The Master’s Garden Committee. A garden grand opening is held each spring with the community gardeners sharing a meal and gardening tips. Surveys are taken to ask the gardeners about their gardening needs and expectations in order to meet their anticipations. For example, many of the families are Hispanic and request more peppers and corn seed for their cultural eating desires. The Master’s Garden Committee attempts to meet each expectation expressed through the gardener’s surveys in order to make the garden a positive experience for the family gardeners. The survey covers family health, eating habits, and gardening skills needed to be a successful gardener.

The excitement of the project has become contagious among the Chisholm residents as they feel ownership of the garden and proud of the produce grown in their gardening plots. The ultimate goal of building a happier healthier community is rooted in the success of The Master’s Garden.

In addition to the positive impact the garden has made in the Chisholm Community, local school children have benefited from its produce, as well. The Master’s Garden has provided learning, engaging field trips, fascination with nature, and the opportunity to develop untapped talents and passions through their experiences at the garden. A total of 625 children visited the garden in 2017. The Master’s Garden Committee hosted 150 children to pick from 1000 commercial strawberry plants in April-May, 2017 with an additional 475 visiting the garden’s pumpkin patch in October, 2017. These children have had the opportunity to experience firsthand the wonders of the world, the responsibility of growing specialty crops and the tastiness of healthy eating habits.

Because of the 2014 USDA Specialty Crops Grant The Master’s Garden Committee was able to purchase materials to complete work on the garden infrastructure, purchase garden equipment and tools for the garden and hire a garden steward.
Garden fencing, an irrigation system and needed equipment were provided through the 2014 grant. Willing volunteers provided all needed labor to ensure the success of the project.

Those same volunteers have exceeded the goal of providing nutritious fruits and vegetables though a communal garden planted in The Master’s Garden. Many have benefited from the fresh produce available in the communal garden. Chisholm residents are invited in to pick from the seasonal produce, while regular deliveries are made to the Community Ministries Food Pantry, Montgomery Area Food Bank, and the Friendship Mission’s Soup Kitchen in Chisholm.

**BENEFICIARIES**

Since spring, 2015 The Master’s Garden has produced an approximate 14,000 lbs of produce. Gardening families, Chisholm residents, and Community Ministries Nehemiah Children’s Program have gathered fresh, nutritious fruits and vegetables from the garden. The Montgomery Area Food Bank, Community Ministries Food Pantry and the Friendship Mission in Chisholm have also enjoyed the garden’s bounty.

Children from local schools in kindergarten - 2nd grade have experienced the garden through learning field trips. 625 school children have picked strawberries and pumpkins, planted beans and corn and learned the benefits of growing fresh produce.

The garden has also opened and hosted children from Success By Six, The Boys and Girls Club, Chisholm Elementary Pals Class and homeschooled children. These children have enjoyed the strawberries and pumpkin patches, as well as a garden scavenger hunt and a garden themed snack.

**LESSONS LEARNED**

Since the majority of our gardeners are Hispanic, language has been a significant challenge. Plans to hold nutritional teaching sessions and gardening seminars with our participating families have not been realized because of the language barrier. The Montgomery County Extension service was contacted for help, but was unable to provide a Spanish speaking extension agent. The committee has now added a volunteer who speaks the language and has helped with communicating with the gardeners.

The extreme hot temperatures in 2015 provided a failed pumpkin crop in plastic culture. Pumpkin seeds were replanted that season with no success. The Master’s Garden Committee learned that the black plastic culture could be
sprayed with white paint and additional dirt shoveled on top of the plastic culture to prevent steaming the pumpkin seeds. We have experienced a healthy pumpkin crop the last two growing seasons after making the necessary changes to the plastic culture.

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Project Title: Good Food Day
**Project Summary**

Good Food Day is an educational, hands-on field trip designed for students to experience the entire seed to plate process on a working farm. During the trip, students learn about farming, ecology, and nutrition. They also harvest and taste produce onsite.

Good Food Day addresses the lack of healthy food choices and information among young people. Good Food Day increases the consumption of fresh fruits and vegetables through educating about and exposing students to just harvested fruits and vegetables on the farm.

The project is timely because Alabama ranks among the highest in the nation for diet-related diseases. E.A.T. South and Good Food Day act to improve the health of our community through providing direct access to fresh fruits and vegetables in an area lacking in produce outlets as well as exposing children and adults to new foods and flavors in a fun, supportive, and educational environment.

This project did not build upon a previously funded project by the SCBG.

**Project Approach**

While E.A.T. South focuses on Central Alabama for Good Food Day outreach, children come from all over the state to participate. From 2014 through 2017, Good Food Day increased the exposure to and consumption of fresh fruits and vegetables among River Region young people by:

- Staffing the Good Food Day Coordinator position providing dedicated educational staff to reach additional schools, coordinate volunteer educators, work with teachers and educate students.
- Increasing the amount of educational garden space dedicated to specialty crops. Seven raised beds were built by the Outdoor Classroom (228 ft sq), and seven additional garden spaces were installed in the History Garden.
- Planting an orchard that includes blueberries, muscadines, persimmons, pears, apples, figs, and satsumas.
- Developing a food assessment tool delivered to students before and after field trips.
- Creating six educational signs with corresponding online content highlighting lessons learned during Good Food Day including nutrition and parts of a plant.
Significant project partners include the City of Montgomery who donated the culverts for the orchard and History Garden as well as the labor to extend irrigation to the new garden beds. Volunteers, including students from Tuskegee University and Cadets from Maxwell Air Force Base, contributed several hundred hours of service by educating students during the field trips, installing pavers, and helping construct raised beds.

**Goals and Outcomes Achieved**

Measuring students’ knowledge of fresh fruits and vegetables through the Food Literacy Scores. The original proposal focuses on a student test to evaluate their learning, the Food Literacy Score. The food literacy score was not deemed to be all that useful for assessing the broad number of topics we cover in the field trip. Very few teachers completed the pre and post test evaluations leading to a lack of data overall. The Good Food Day Coordinator and Education Director determined through experience that students engage more in the field trip when experiencing and interacting with the farm rather than drilling them about details. Thus, rather than trying to assess student retention, the Good Food Day Coordinator created an assessment for teachers to fill out during the trip.

Increasing the numbers of students and schools participating in Good Food Day through outreach and marketing: Since 2012, nearly 7,000 students attended a Good Food Day field trip ranging from preschool age to 12th grade. The graph below details the growth of our program attendance since its foundation. After receiving the Specialty Crop Block Grant in 2014, numbers increased dramatically, as shown through the graph.

![Good Food Day Attendance Graph](image-url)
Staffing Good Food Day - Amanda Edwards was hired as the Good Food Day Coordinator for 2015 and began implementing outreach and data collection activities. A significant staff transition (see lessons learned) in the summer of 2015 required the elimination of the Good Food Day Coordinator position. By the fall of 2017, E.A.T. South was able to rehire Ms. Edwards to staff Good Food Day, and E.A.T. South will support the program and the position on an ongoing basis.

Expanding the educational opportunities for Good Food Day - E.A.T. South completed the construction of the History Garden, the orchard, and additional garden beds next to our outdoor classroom. The Farm Director is in the process of creating a new curriculum (to be completed in Spring 2018) to engage students in the History Garden based on the history of Alabama’s food culture. Since 2015, the History Garden has provided students with exposure to heirloom varieties of okra, sweet potatoes, watermelon, squash, field peas, lima beans and corn.

The 228 sq ft of additional growing space, completed in the fall of 2017, are growing chard, carrots, beets, lettuce, mustard, cauliflower, collards and kale. Located next to the Outdoor Classroom, these beds will continue to engage children through tasting and cooking projects. Made of cedar, the beds will last for many years, and in the summer of 2018, we plan to grow the vegetables that make up one of the foods most often listed as a favorite by students - pizza.

The orchard was planted in 2015, and by the fall of 2017 produced a large crop of satsuma oranges. Sixty fortunate preschoolers and their families were able to sample this sweet citrus crop. We have also had a small crop of figs and blueberries. The grant included funding to espalier the pear and apple trees, but the Farm Director determined that a fence would make it difficult to move groups of children through the orchard. Materials for fencing/espalier were not purchased.

Six educational signs reinforcing Good Food Day lessons were developed in 2017 and installed in September. These signs both enhance the educational experience of students during Good Food Day and provide important information about food and nutrition to families who visit the farm on their own. The signs include QR codes linking them to additional subject area content on our website.

Beneficiaries

The primary beneficiaries of Good Food Day are the nearly 7,000 pre-Kindergarten through twelfth grade students who experienced new foods and active, hands-on lessons through Good Food Day since its foundation. Teachers and parents who accompany the students are also exposed to new fruits and vegetables and are often surprised by the enthusiasm the children show for trying new things.

E.A.T. South staffs a booth at a farmers market, and we have encountered at least forty parents who visited the market for the first time because of their Good Food Day experience. Increasing the number of consumers purchasing fresh fruits and vegetables at the farmers market benefits the farmers selling at those markets.

Through the construction of the garden beds and orchard, E.A.T. South provided volunteers with information to enable them to grow their own vegetables, build their own garden beds, or plant fruit trees.
At least seventy people learned about pruning orchard fruit, building raised beds, and installing permeable pavers. By providing education to the greater community, we increase their gardening skills, ability to grow fresh fruits and vegetables (and purchase specialty nursery crops) and improve overall health.

**Lessons Learned**

Between the awarding of this grant and its completion, E.A.T. South went through a very significant staff transition, including the departure of the Executive Director, Farm Director and the reduction in staff from seven to two. When the transition occurred, a little over half of the construction projects outlined in the grant had been completed. Some of the work was delayed by these significant changes, and several projects outlined in the grant (such as the espalier) changed slightly because of new farm leadership. Even through dramatic changes, E.A.T. South completed the expansion of its educational gardens, increased the number of students participating in Good Food Day, and by the end of 2017, the organization has a thriving Good Food Day program with a half time coordinator.

Teachers do not have the time and capacity to administer the pre and post trip evaluations to students. Upon heavy consideration, we concluded that our target audience for Good Food Day is the teachers. The teachers come back each year and bring their students looking to take their classroom learning to a new level. Thus, we created a new evaluation system that allowed teachers to give us feedback about the effectiveness of Good Food Day. This is a great system for receiving constructive feedback in order to continue building our program to reach more students throughout Alabama. We believe every student deserves a Good Food Day.

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**Additional Information:**

Please see the attached documents for photos from Good Food Day, the construction of the garden beds, and the educational signs developed for the project.
Name of the State Department of Agriculture: Alabama Department of Agriculture and Industries

State Point of Contact: Mr. Johnny Blackmon

USDA ASM Agreement Number: 14-SCBGP-AL0001

Type of Report: Final Report

Date of Report Submission: 3-13-2018
Discovery of fungal symbionts. Our lab has identified more than 200 fungal endophytes from wild plants growing under various environmental conditions in Alabama. We focused our collections on areas impacted by drought, high salinity, and severe nutrient deficiencies. These areas included Sumter County located in Alabama Black Belt region and the Stimpson Wildlife Sanctuary (SWS) of Southern Clarke County, AL. Sumter County soil is chalk based poor in nutrients, and exhibits extreme pH. While SWS is located in the lower Tombigbee River drainage of the East Gulf Coastal Plain and characterized by presence of many salt springs, with salinity ranging from C at the salt springs to essentially 0 ppt at the nearby freshwater springs and creeks. We collected more than 40 different plant species and isolated their fungal endophytes. We have screened the effects of 25 different endophytes on the growth of tomato plants (our model system) and identified two strains with promising potential applications for improving the drought and salt tolerance of plants and the quality and quantity of tomatoes. These fungal strains, their original plant host, location and similarity to known plants and fungi are listed in table (1).

<table>
<thead>
<tr>
<th>Fungal endophyte</th>
<th>Accession no.</th>
<th>Identity (%)</th>
<th>Host Plant</th>
<th>Habitat</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampelomyces sp.</td>
<td>AY513943.1</td>
<td>100</td>
<td>Pyrrhopappus carolinianus</td>
<td>Drought/poor soil</td>
<td>Sumter County</td>
</tr>
<tr>
<td>Penicillium sp.</td>
<td>KP068959.1</td>
<td>99</td>
<td>Acer negundo</td>
<td>High salt</td>
<td>SWS</td>
</tr>
</tbody>
</table>

Table 1: Fungal endophytes used in this study, their host plants, and habitat/location from where they were collected. Plants were identified based on their phenotype and chloroplast tRNA sequence, while isolated fungi were identified based on their ITS sequences. Fungal identity and GenBank accession number is shown.

PROJECT APPROACH

Greenhouse testing. We have tested the effects of 25 fungal endophytes on tomato growth under greenhouse conditions. Groups of 10 one-week old tomato seedlings were colonized with one of each of the fungal endophytes and then planted in pots under standard greenhouse conditions. Four- to 6-week-old seedlings were visually screened for any disease symptoms. Seedlings with disease symptoms were eliminated (18 endophytes). Tomato seedlings with no apparent symptoms continued to grow in the greenhouse. In 3 experimental trials of the remaining 7 endophytes with no disease symptoms, plants in symbiosis with 2 different fungal endophytes, *Ampelomyces sp.* and *Penicillium sp.*, showed a significant and reproducible increase in tomato vegetation compared to the non-symbiotic tomatoes 6 weeks after planting (Fig. 1 a & b). However, plants in symbiosis with the other five fungal endophytes did not show
any positive effects in terms of growth, nor did they provide reproducible results (data not shown). Plants colonized with *Ampelomyces sp.*, which was isolated from a plant growing in poor soil under drought stress, were tested for drought tolerance. Drought was applied by termination of bottom watering and allowing the soils to dry. Upon plants showing wilting symptoms (severe wilting for non-symbiotic, and mild for wilting for plant colonized with *Ampelomyces Sp.*), each plant was rehydrated by adding 75 ml sterile water (1/4 of water needed for soil saturation). After 6 cycles of drought/watering, watering was terminated and plants were exposed to zero moisture for 10 days, followed by watering. Two-days after watering, plants colonized with *Ampelomyces sp.* recovered well, while NS were in very poor conditions (Fig. 1 c). Similarly, plants colonized with *Penicillium sp.* and NS control plants were salt stressed by watering them with 500mM NaCl every other day for 4 weeks followed by 2 days with just water. Symbiotic plants recovered relatively well, while NS plants were in very poor health (Fig. 1 d). When stressed plants were allowed to grow under no stress until fruits production, the symbiotic plants produced significantly more fruits compared to non-symbiotic plants (Fig. 2). The average fruits weight of fruits produced by non-symbiotic were significantly less than the symbiotic plants of both treatments (Fig. 2 a), and the total fruits production of symbiotic plants was significantly higher than non-symbiotic plants (Fig. 2 b).
Field testing. We conducted a limited field trial to test the performance and production of non-symbiotic tomato plants to those traits in tomato plants colonized with *Ampelomyces sp.* and *Penicillium sp.* Twenty tomato plants in each group were germinated and colonized in the greenhouse for 3 weeks and were then transferred to a field plot. Plants in each treatment and control were planted 5 feet from plants of the same treatment. A buffer zone of 10 feet was used to separate treatments (Fig. 3a). Plants were grown for 4.5 months under field conditions with continuous watering using a drip system at a rate of 0.5 gallons per plant per day. After 90 days, fruits were collected every 2 days, when they were pinkish in color. Fruit number, weight, volume and size were measured for each fruit collected and fruit production of each plant was tracked. The overall fruit production of non-symbiotic tomato plants (140 kg total) was higher than that of *Ampelomyces sp.* (110 kg) and *Penicillium sp.* (120 kg) (Fig. 3b). However, based on more than 300 blind surveys (untrained people) that included comparisons between symbiotic and non-symbiotic tomatoes evaluating the visual appearance, freshness, flavor, color, texture, smell, and overall flavor, tomato fruits produced by plants with symbionts had superior appeal (particularly *Ampelomyces sp.*) to consumers compared to those produced by non-symbiotic tomato plants (Fig. 4). Although this survey used untrained volunteers, it represent the perception of tomato quality based on regular consumers. However, a trained panel is needed to confirm these results.

Figure (3) Tomato production under well-watered conditions in the field. Non-Symbiotic (NS) tomato production was compared to tomato colonized with *Ampelomyces sp.* and *Penicillium sp.* (a) Twelve of each symbiotic and non-symbiotic plants grown under well-watered field conditions. (b) Total tomato production of the three treatments at the end of the growing season. Bars represent standard deviation.

Figure (4). Number of people with excellent rating of the non-symbiotic and symbiotic tomato fruits. Untrained volunteers were asked to rate the fruit taste, color, visual appearance, odor, flavor, color, and overall rating on a scale of poor, good and excellent. The representative graphs showing number of survey takers with excellent rating of non-symbiotic and symbiotic fruits.

**GOALS AND OUTCOMES ACHIEVED**

**Comparison of actual accomplishments with the goals:** Our proposed target was to identify 4-6 beneficial symbionts and test them for their effects on tomato production. However, we have
two beneficial endophytes that had a reproducible data under greenhouse and field conditions. In addition, three other endophytes have some issues with reproducibility, therefore, further testing of these endophytes are needed. With the type of data shown above, we believe that we have accomplished what we proposed; moreover, the results are very promising and can lead to significant increase in tomato production. Additionally, we are in the process in optimizing a seed coating mechanisms to introduce these beneficial fungal endophytes into tomato, which is a step closer to a product that can be used by farmers.

**Contributions and role of project partners:** All greenhouse and field trials were designed by the project Principal Investigator (PI), Dr. Mustafa Morsy. All experiments were performed by the project PI and his lab staff and students. The co-PIs, Mr. Micky Smith and Dr. Andrea Mayfield have been contacting local farmers and informing them about our research program. Several local farmers have visited our greenhouse and field to get a closer look and understand the process and progress of the project.

**Progress toward achieving outcomes:** We achieved 100% of the outcomes of the proposal based on the baseline and the data collected.

**Problems And Delays:** The project deliverable was achieved on time.

**Future Project Plans:** We plan to continue optimization of seed coating mechanism and test its efficiency in infecting tomato, and production of reproducible results. In addition, we started testing these beneficial fungal endophyte on other important crop such as sweet corn and potato.

**Grant funds expended to date:** The total proposed amount of $22,510 was spent in various laboratories, greenhouse ad field supplies, as described in the submitted proposal.

**Project income:** None

**BENEFICIARIES**

We estimate that the project will eventually benefit hundreds of small and large farmers, including socially disadvantaged and beginning farmers as defined in the RFA.

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Johnny Blackmon, Director
FY 2014 Specialty Crop Grant Program

USDA AMS Number: 14-SCBGP-AL0001

Final Performance Report, March 2018

**Project Title:**

A project to enhance food safety in regional small scale honey production by reduction/elimination of contaminants utilizing practices for better process control in local honey crops.

**Project Summary:**

The background of this project was to develop better honey processing practices, educate individual beekeepers in modern techniques, and provides modern honey processing equipment in an effort to help eliminate as much unwanted contaminates as possible from the specialty finished product of local honey. After review of current member practices, the project proposal was defined. Initial data showed that many varied methods of final honey processing was being utilized by small scale producers. Of the 57 members at the project inception, processing was not being accomplished in a consistent method that provided clean finished product.

Motivation for the project was identified after discussing issues among members regarding processing techniques. As the need for locally produced honey continued to increase, demand for a “premium” product by the consumer increased. Processing practices and equipment necessary to fall in line with better practices was needed to make this project work so our request supported those items.

This project was not built on any previously funded project.

**Project Approach:**
• Goal #1 from our grant was to increase the use of local made wax foundation from our own rendered cappings to reduce contaminants. Since it requires a significant amount of wax to melt and reclaim before we can produce our own foundation, members of the association began collecting their cappings and freezing them from their seasonal honey flow in 2016. All member collected and frozen cappings will be processed for our first foundation production once equipment is in place to melt and roll the foundation.

• We have trained all members in using the equipment during 2017. We plan to continue to train and in-service all members each spring before the honey processing season as a refresher. This will maintain continuity each year as members come and go within the organization. Plans and processes are in place to ensure that all members utilize better process control practices when preparing their honey for the market.

• It appears that market reaction to better, safer honey is widely accepted since members are selling 100% of their available products at a premium price. Our average price per pound in the club has increased by $1.50 per pound. Members now report no available honey supply available into the next season.

• Additional value added bonuses include 3 members working to increase honey production due to increased demand for the product in our area. Since the overall cost of production of higher quality product has been reduced, it has become more cost effective to produce product in larger quantities at the same or lower cost. This was an unexpected valuation to the project.

• Goal #2 from our grant was to produce a better process control plan so that members could follow best practices for processing honey. Mr. Monroe has completed the education and is beginning to train members of the EABA on how to properly process honey using food sanitation procedures.

• We recently demonstrated the mobile processing unit at the Auburn University Spring Beekeepers Seminar conducted at Clanton, Alabama. Over 700 beekeepers were in attendance and had an opportunity to view demonstrations of the unit during the meeting.

Our project partners were members of the club. There were few outside contributions other than presentations made to the Alabama Beekeepers Association for two years regarding awareness of the processing unit and its value added capabilities.

Goals and Outcomes Achieved:
Goals achieved were as follows:
- Trained all members initially and annually regarding best practices for honey processing
- Employed methods of honey production utilizing the equipment that would allow the finished product to be labeled as processed in a food grade environment.
- Developed a written plan for training members to process honey and wax using industry standard practices

Long term outcome measures are being seen by members. The value of the overall product has increased somewhat each year as well as the request for members products have increased based upon member reports. Further data must be gathered to determine if this increase is due to increased market demand for local food products by citizens or because our members advertise that they process in a suitable environment.

Actual goals compared to accomplishments are as follows:
- Equipment being utilized has increased local honey production by cutting down waste and time necessary to process the product. This has increased value of the crop
- After much work, wax pressing by members has not worked out well. Our goal was to utilize cappings to make imprintable wax foundation. It has been found that most members cannot collect enough cappings throughout the harvest season to meet their foundation needs without supplemental wax purchases. This process negates any advances made from member collections.
- Wax used by members has been shown to be very free of chemicals. We are working to determine if this is due to decreased pesticide usage around areas local beekeepers have colonies stationed. This determination will be ongoing.

Completion of achieved outcomes:
- Provide training in clean processing techniques to all members
- Provide best practice techniques to members regarding honey processing
- Provide appropriate commercial equipment that is mutually shared among members for processing that can be decontaminated and easily cleaned during process season.
- Engage outside agencies regarding the program, its goals, and its effects on beekeepers employing better process control practices.

Beneficiaries:
Groups benefiting from this program include the 57 members and all future members of the East Alabama Beekeepers Association. We have also worked with members of the Alabama Beekeepers Association presenting information about our processing system and best practices.

Lessons Learned:
- A project like this takes considerable time to complete. There must be a relatively large contingent of people working on various parts of the program to complete it in a timely manner.
- The addition of commercial equipment has greatly impacted our memberships processing capability. Using modern equipment and techniques, members can greatly reduce honey processing time and resources.
- Better process control helps members work more effective. We found that there were many variations of how process honey. One standardized way has helped considerably.
- Older members are sometimes harder to embrace change. Many have processed honey for tens of years a particular way and it is tougher to get them to embrace change. Be prepared for a variety of methods to complicate training members.
- Very small producers (2-3 colonies) see little benefit of the project. It is predicated on the fact of commercial honey sales versus purely hobby interest for personal use.

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