



**GEORGIA DEPARTMENT OF AGRICULTURE  
2010 Specialty Crop Block Grant Program  
Final Performance Report - 12-25-B-1062  
Date Re-Submitted: December 10, 2013**

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## **1. Georgia Department of Agriculture – Georgia Grown – Final Performance Report**

### **Project Summary:**

On January 1<sup>st</sup>, 2012 the Georgia Department of Agriculture “re-launched” the Georgia Grown program. The top priority of the new Georgia Grown program was to increase the sales of Georgia Grown specialty crops and products that include specialty crops. The new program was designed to develop consumer awareness of Georgia Grown specialty crops, educate producers on marketing strategies, and to create new markets for specialty crops.

### **Project Approach:**

The New Georgia Grown Program started with a new logo and brand that would easily identify specialty crops as being locally grown. Many consumers, both shoppers and wholesale buyers, had difficulty identifying specialty crop products that were grown in Georgia. The new Georgia Grown logo had to be unique enough to catch the consumer’s eye, but simple enough to easily reproduce in a small area with only a few colors. We believe that the new Georgia Grown logo achieves both of these goals. In addition to the logo, Georgia Grown also created a membership database, fostered producer education, and created partnerships with retail outlets and institutional buyers.



For the New Georgia Grown program to be a success, it needed to be more than just a fresh logo. Georgia Grown needed the support and buy-in from the agriculture producers and food processing industry. Therefore, we created a membership system where agriculture producers could sign up free for the website, but had to register to become a member of Georgia Grown if they wanted to use the logo. This creates a community and core group of products that we could actively promote. The website and application process to attract Georgia Grown memberships can be found at [www.GeorgiaGrown.com](http://www.GeorgiaGrown.com).

The Georgia Grown program itself has generated roughly \$80,000 in revenue through the period of this grant. The revenue was exclusively spent on the Georgia Grown program and was used to supplement the activities described in the grant. None of this money was used for specific projects that did not benefit specialty crops.

Another main strategy of the Georgia Grown program is to improve specialty crop producer education in the areas of regulations and marketing. There is a myriad of producer questions relating to regulator and marketing issues, Georgia Grown has worked to provide easily accessible information to producers. Since January 2011, Georgia Grown has produced an e-newsletter every month that contains information pertinent to specialty crop producers. We have also created special email alerts to notify our members of special events, trainings, financial assistance, and regulatory changes. In November, we hosted the first annual Georgia Grown symposium that attracted more than 200 specialty crop producers. The symposium offered presentations and trainings on a number of topics including farm liability, marketing through social media, cottage food regulations, and product labeling.

The new Georgia Grown initiative also focused on creating strong partnerships with retail companies, wholesale distributors, and institutional buyers. These partnerships and relationships will help the program to bolster the sale of Georgia Grown specialty crops in all sectors of the produce consumer market. During the first year of the program, we were able to secure partnerships with Harvey's supermarkets and Kennesaw State University. Harvey's Supermarkets is a major grocery store chain with more than 70 stores in central and south Georgia. Harvey's was eager to partner with Georgia grown to showcase their locally produced agriculture and processed food items. Through our new partnership, Harvey's has incorporated the Georgia Grown logo and farmer biographies into their produce displays. In addition, Harvey has unveiled new Georgia Grown end-cap displays, which highlight Georgia grown products, in all of their stores. More information can be found at <http://www.harveys-supermarkets.com/OurCommunity/WeLoveLocal>.

Georgia Grown also fostered a strong relationship with Kennesaw State University and their student cafeteria called "The Commons". Under the direction of Chef de Cuisine Gary Coltek, The Commons seats more than 1,200 and serves breakfast, lunch and dinner to thousands of members of the KSU community each day while embracing the farm-to-table concept popular in many restaurants. Much of the produce is organically grown on one of the university's two farms, picked and brought to KSU each morning. They use herbs out of the 3,500-square-foot organic herb garden, bake their own bread, brine their own corned beef and make their own pizza dough and pasta. To ensure maximum freshness, food is prepared in small batches throughout the day. Diners with special dietary needs are easily accommodated. The award-winning facility is also the largest Gold LEED-certified college food service building in the country. We hope this program with Kennesaw State University can be a model to expand to other universities throughout Georgia.

The Georgia Grown program was designed specifically as a specialty crop promotional initiative. The vast majority of all resources and efforts as part of the program went to enhancing the sale

of specialty crops or products containing specialty crop ingredients. While some non-specialty crops did see an incidental or spillover benefit to being part of the Georgia Grown program, they were not a focus of the program. Only a few small meat, cheese, and dairy producers could benefit from the local branding and marketing strategies created by the Georgia Grown Program. Major Georgia commodities like cotton, peanuts, corn, beef, and soybeans are not marketed as local specialty products and could not/did not benefit from the Georgia Grown Program. Furthermore, we are able to closely monitor the types of products that are using the Georgia Grown logo through our licensing and website registration process. Therefore, we can monitor the logo usage and adjust the registration if necessary.

In addition, the Georgia Department of Agriculture has dedicated significant resources to the Georgia Grown program. These resources include over \$300,000 in personnel costs, department facilities and equipment, more than \$30,000 in printing costs, and \$60,000 in contractual services.

### **Goals and Outcomes Achieved:**

- Increased awareness of agriculture measured via:
  - More than 215 specialty crop producers have become full paying members of Georgia Grown. In addition, more than 485 producers have registered on the Georgia Grown Website.
  - The unaided awareness and other metrics were measured as part of a study completed by Marketing Workshop. The study surveyed a total of 40 online quantitative interviews with qualified consumers in the fall of 2012.
  - The study found that unaided awareness of the Georgia Grown initiative is at 6% among consumers in the state of Georgia, with aided awareness being at 58%. Our goal is to improve unaided awareness to 50% by EOY 2014. The full study can be found in the appendix.
  - This project achieved and surpassed its goal of 20% awareness by reaching 58% aided awareness.
  - The study also found that over three quarters of Georgia consumers indicate knowing a product is locally grown/produced while shopping is at least somewhat important to them.
  - Consumers with kids are significantly more likely to say they know a lot about Georgia Grown than consumers without children in the household
  - The two specialty crops most recognized as being Georgia Grown are peaches and onions.
  - Consumers believe that buying Georgia Grown specialty crops has a positive impact on the Georgia economy.
  - More than 8 new Georgia Grown procurement relationships have been created to increase the sale of specialty crops.

- Increased partnership opportunities between Georgia specialty crop growers/producers and merchandising outlets or distributors. Measured by:
  - Since the beginning of the new Georgia Grown program there has been more than \$600,000 in new Georgia Specialty Crop partnership deals.
  - Georgia Grown has created a marketing and retail sales partnership with Harvey's and Kroger supermarkets
- Hosted the first annual Georgia Grown Symposium with more than 215 guests on November 8-9, 2012
- Increased participation of disadvantaged specialty crop producers, in Department marketing programs. More than 20 Georgia Grown members are located in counties identified by the USDA Strikeforce.

The Georgia Grown program has received a great response from our website and the media. The Website currently has over 800 unique profiles; Georgia Grown has 5,512 likes on facebook (<http://www.facebook.com/georgiagrown>); and 2,415 followers on Twitter (<http://twitter.com/GeorgiaGrown>). We have received several great articles in local and industry media. *The Packer* recently produced a great article on the Georgia Grown Program. (<http://www.thepacker.com/fruit-vegetable-news/shipping-profiles/State-program-a-plus-for-locally-grown-items-222692541.html>)

Unfortunately, we have had difficulty with some of the website metrics from our website. We hope to produce more specific information on actual web traffic analytics within the next few months.

#### **Beneficiaries:**

- More than 125 Georgia Specialty Crop Growers have specifically used the Georgia Grown Program
- More than 45 Georgia food manufacturers that use specialty crops in their products
- Georgia retailers that are taking advantage of the Georgia Grown retail advertising
- Georgia consumers who are now able to easily identify products that are grown in Georgia

#### **Lessons Learned:**

The Georgia Department of Agriculture learned several valuable lessons during the implementation of the New Georgia Grown program.

- Our surveys and research showed several valuable lessons:
  - There is an opportunity to grow the locally grown category by expanding beyond well-known specialty crops such as peaches and onions to other specialty crops like pecans, watermelons, blueberries, and carrots. Ornamental plants could also be targeted.
  - The overall locally grown movement would benefit from a more consolidated pricing message – e.g. “you get better quality, but pay the same amount for locally grown products.”
  - There is an opportunity to expand locally grown specialty crop positioning to include more consumer centric benefits – i.e., locally grown is good for local businesses, the local economy, and consumers.
  - Since older consumers are more knowledgeable about the locally grown products and are more likely to seek out locally grown products, specialty crop producers should consider a targeted campaign to local consumers under the age of 35 in an effort to educate them on the value and availability of locally grown products.
- Most farmers and agriculture product producers are unaware of the marketing and financial services available to them at the state or federal level. More outreach needs to be done to educate farmers on the availability of this assistance.
- There is a growing need for a gourmet foods association in Georgia. The specialty foods producers in Georgia would benefit greatly from an organization that represents and promotes small scale gourmet food producers. This organization would be able to create economies of scale in the buying of inputs, represent Georgia producers at national trade shows.
- More specialty crop sales data is needed. The State of Georgia needs better data tracking the sale and exports of specialty crops. The best current data is generated by USDA NASS and USDA ERS. However, this data is limited to aggregate sales and farm gate value. Tracking specific specialty crops showing how the crops were sold, where they were sold and for what price, would assist in evaluating these types of promotional programs and would benefit Georgia’s farmers.

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**Additional Information:**

Examples of Marketing Materials:





  
**GEORGIA**  
grown  
*Symposium*  
2012

Growing your Business  
through Georgia Grown





## **2. Georgia Watermelon Association – Increasing Grower Profitability through Expanding Market Share – Final Performance Report**

### **Project Summary:**

This project's goal was to promote the heart healthy benefits of eating watermelon to the general public. As a secondary objective, the project was to highlight the economic

benefits of supporting local farm family agriculture through the local 'Georgia Grown' promotional program from the Georgia Department of Agriculture. This promotion program raised the awareness of the health benefits of consuming Georgia watermelon which also helped to strengthen the long-term economic stability of the State's watermelon industry.

Watermelon promotional programs were designed to increase the sale of Georgia watermelons during the Georgia growing season. During the period of October 2010 to October 2011, the actual number of melons on the market was down – not due to demand but due to weather. The pounds of Georgia melons shipped in 2011 were down from 2010 by more than 243,000,000 lbs from 672,000,000 lbs. to 429,000,000 lbs. The good news is the FOB price was up almost 100% - in 2010 it was \$ 0.11/lb. as compared to \$ 0.21 in 2011.

This project used promotions, media appearances and marketing to accomplish its objectives.

#### **Project Approach:**

The project approach was to inform the general public of the health and nutritious benefits of eating Georgia grown fresh watermelon. The objective was twofold: 1) provide information on the best methods to employ when purchasing a watermelon; and 2) provide information on the continued health benefits of including watermelons in the diet. Several activities were utilized to achieve this objective including in-store promotions, personal appearances by the Georgia Watermelon Association (GWA) spokesperson at media events and interviews with media outlets, a National Watermelon Month promotion with the Atlanta Braves at Turner Field during the 4<sup>th</sup> of July weekend and an in-flight video commercial on all Delta Airlines flights in June 2011.

#### **Goals and Outcomes Achieved:**

The goal of the project was to educate consumers on the health and nutritional value of eating fresh and tasty Georgia watermelons. This goal was accomplished through the following activities as evidenced by the Measurable Accomplishments noted below:

- **In-Store Promotions** at local and regional retailers to promote local area watermelon growers. The original proposal called for 15 in-store promotions. We executed 14 in-store promotions during the grant period. In addition, the GWA spokesperson participated in a farm tour to several watermelon farms with buyers from a major retail chain that serves customers across the east coast, and also visited with retail buyers at the Produce Marketing Association (PMA) trade show.

#### **Measurable Accomplishments:**

The in-store promotions varied by day of week; however, most of the promotions were four to five hours in length from 10 AM - 2 PM or 1 PM - 5 PM. During the 14 in-store promotions:

- The average customer count during the times of the promotion was 463, with an average of samples distributed per store of 117. *This meant we reached approximately 25% of the customers with a sample and best estimate over 50% of the customers noticed the promotion in process.* A total of 1,521 samples were distributed in the promotion.
- During in-store promotions, 227 melons were sold, averaging 17.5 melons per store. While most produce managers would not release exact sales numbers and provide comparisons, *the managers did say they saw sales increase from 20% to 35% during the in-store promotion.*
- We requested funding for 15 in-store promotions. However, in order to reach more stores, *GWA cooperated with two retail chains – Harvey’s and Kroger to encourage Georgia watermelon sales during the 2011 season.* For Harvey’s a retail display and promotional contest was held with 12 to 15 stores participating. The Kroger promotion focused on their weekly produce manager calls and each week a different store was recognized for their efforts in promoting watermelons. During the season, eight different stores were recognized for their efforts.
- **Appearances at Media Promotional Events.** Personal appearances and media interviews by GWA spokesperson. The original proposal was for 10 events; there were 10 media events as a part of the promotional grant.

Measurable Accomplishments:

- Numerous opportunities to speak to print and electronic media.
- *Reached over 10,000 people attending promotional events.*
- **Major Event Promotion in Conjunction with the Atlanta Braves.** GWA held a two-day promotional event at an Atlanta Braves game to celebrate National Watermelon Month over the 4<sup>th</sup> of July holiday, with watermelon samples, seed spitting contests, media interviews/promotion and the Braves official broadcast announcers highlighting watermelons during their ‘play by play’ commentary.

Measurable Accomplishments:

- Approximately 80,000 people attended the two games and thousands of those fans passed by the GWA tailgate at the entrance gate to Turner

Field. Over 3,500 watermelon samples (10,000 bite size cubes) were distributed during the two-day event.

- Turner Field, home of the Atlanta Braves, has over 600 monitors throughout the stadium concourses, concession areas and restrooms so fans can keep up with the game while they are away from their seats. Information about the game, player stats, opposing team stats, etc. usually airs two hours before game time so there are approximately 5 hours of air time on these monitors for each game. As the info/game is aired, there is a banner ad that covers 1/3 of the screen area on the monitors for sponsors.

During the month of July, Georgia Watermelon Association was a sponsor and had a 10-second 'You Just Can't Hide the Goodness of Georgia Watermelons' ad that aired every three minutes on all 600 stadium monitors. *This coverage gave Georgia Grown melons over 36,000 10-sec impressions per game or one half million (540,000) 10-sec impressions during the month of July and August.*

- During the two-day promotion, the GWA spokesperson had an on-the-field appearance during the post game 'Kids Run the Bases' activity and served as the Honorary Team Captain for the Braves on July 3. *During the July 2 game, GWA received animated LED scoreboard graphics during the bottom of the 3<sup>rd</sup> inning with 37,259 people in attendance.*
- **Production and Airing of Video Ads.** A 60-second commercial was produced with assistance from the DELTA 'In-flight' entertainment group.

Measurable Accomplishments:

- *The 60-second spot aired on all DELTA flights during the month of June. DELTA serves approximately 4.1 million passengers each month.*

There was not an increase of 2% in number of melons shipped from GA in 2011 (due to weather and disease pressures) as compared to the previous rolling year average. However, since we had a short supply of melons in 2011, the average price and the return to the grower both increased. The price increased by 18.1% and the revenue to Georgia watermelon growers increased by 6.4%.

ROLLING AVERAGES:

YEARS	Loads	lbs.	Price per lb.	\$ to Grower
2008/2009/2010	14,773	590,920,000 lbs	\$ 0.132/lb.	\$78,001,440.00
2009/2010/2011	13,307	532,280,000 lbs.	\$ 0.156/lb.	\$83,035,680.00

**Beneficiaries and How They Benefited:**

The beneficiaries of this project were twofold:

- First, the melon growers benefitted. The number of melons sold in 2011 decreased from 2010 by more than 243,000,000 lbs. The number of truckloads shipped out of Georgia also decreased from 16,800 in 2010 to 10,725 in 2011. *However, the price melon growers received from their product almost doubled, from \$ 0.11/lb FOB in 2010 to \$ 0.21/lb in 2011.*
- Second, the thousands of consumers were educated as to the health and nutritional value of fresh watermelons.

**Lessons Learned:**

The DELTA video was the first commercial ad that the Georgia Watermelon Association had ever coordinated. There were lots of lessons learned from how to work with script writers to how to communicate your message in less than 60 seconds. It was a good experience to work with the Delta video production team.

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**Additional Information:**

Please see the following pages for additional supporting visuals of these events.

**INSTORE PROMOTIONS**



**MEDIA APPEARANCES**



## IN-STORE PROMOTION

EVENT - LOCATION	DATE
Food Lion - Cartersville	8/5-7/2011
Harvey's - Cordele/Farm Tour	06/16-20/2011
Harvey's - Gray	03/30-31/2011
Harvey's - Perry	03/18-19/2011
Piggly Wiggly - Americus	05/20-22/2011
Piggly Wiggly & Wal-Mart (2 in-store)	07/3-4/2011
Ingles - Cartersville	07/7/2011
Piggly Wiggly, Kroger, Harveys - Nashville, Macon & Valdosta (3 in-store)	07/19-22/2011
Piggly Wiggly - Thomson	07/23-24/2011
Sam's BBQ - Valdosta	08/27-28/2011
PMA Atlanta (for visiting retailers)	10/14-17/2011

14 In-Store Promotions

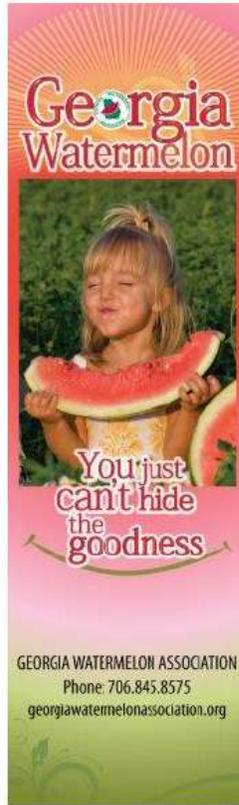
**Atlanta BRAVES PROMOTION** – National Watermelon Month – July 2011



**Kids run the bases for a t-shirt . . . and GWA spokesperson served as the BRAVES team captain.....**



**10 Second Ad** – Aired every five minutes on 600 stadium monitors



 GWA-BravesAd FINAL.mov

## MEDIA PROMOTION

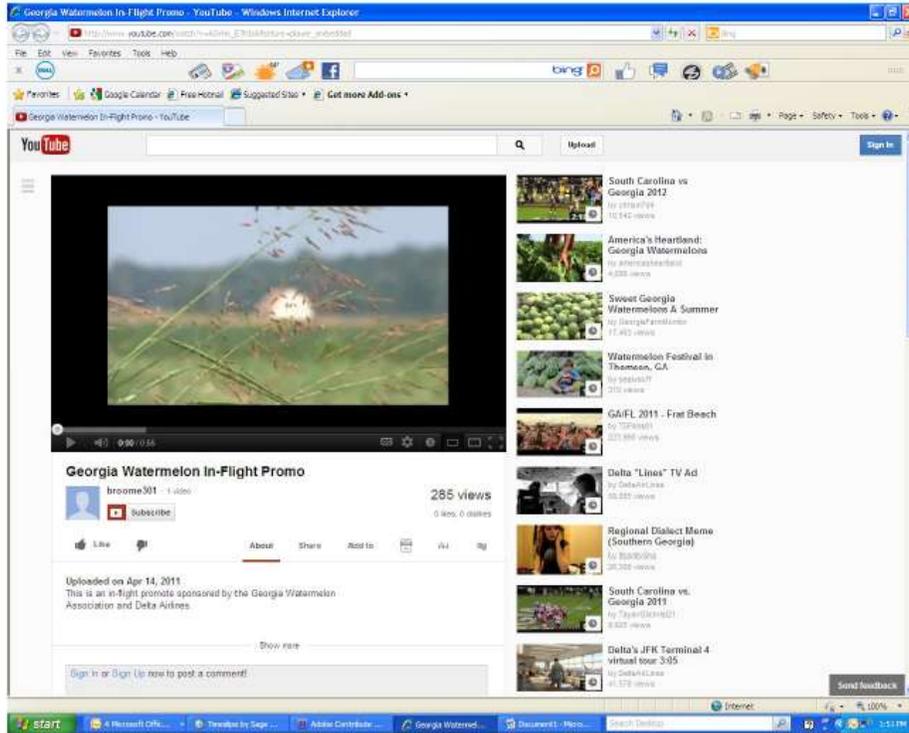
EVENT - LOCATION	DATE
Sunbelt Expo - Moultrie	10/18-19/2010
Cordele Dispatch	11/11-13/2010
Farm Bureau Conv. - Jekyll Island	12/4-6/2010
Ag Awareness	03/22/2011
NWPB Training Seminar	04/08-9/2011
Cordele Watermelon Festival	06/24-27/2011
Moultrie Observer	6/25/2011
Retail Display Contest - Turner Field	8/20/2011
Dirty Dancing Festival - Lake Lure, NC	9/16-18/2011
GWA Sponsor Recognition - Tifton, GA	09/08/2011

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10 Media Promotions

## Georgia Watermelon - 2011 In-Flight Promotion and .60 sec Ad

[http://www.youtube.com/watch?v=kGVHs\\_E7hIs&feature=player\\_embedded](http://www.youtube.com/watch?v=kGVHs_E7hIs&feature=player_embedded)



The screenshot shows a Windows Internet Explorer browser window displaying a YouTube video. The video player is the central focus, showing a promotional video for Georgia watermelons. The video title is "Georgia Watermelon In-Flight Promo" and it has 285 views. The video is uploaded on April 14, 2011, and is sponsored by the Georgia Watermelon Association and Delta Airlines. The video player shows a close-up of a watermelon being sliced, with the seeds and juice visible. The video is currently at 0:00 / 0:34. To the right of the video player, there is a list of related videos, including "South Carolina vs Georgia 2012", "America's Heartland: Georgia Watermelons", "Sweet Georgia Watermelons A Summer", "Watermelon Festival in Thomson, GA", "GAFL 2011 - Fruit Beach", "Delta 'Lines' TV Ad", "Regional Dialect Meme (Southern Georgia)", "South Carolina vs. Georgia 2011", and "Delta's JFK Terminal 4 virtual tour 3:05". The browser's address bar shows the URL "http://www.youtube.com/watch?v=kGVHs\_E7hIs&feature=player\_embedded". The browser's taskbar shows several open tabs, including "Microsoft Office...", "Travel by Sage...", "Adobe Creative...", "Georgia Waterm...", and "Discuwer1 - Home...". The system tray shows the time as 3:11 PM on 4/14/2011.

### **3. Georgia Fruit & Vegetable Growers Association – Increasing Southeastern Specialty Crop Competitiveness and Market Share through Education and Training – Final Performance Report**

#### **1. PROJECT SUMMARY**

This project addressed the need for continued education, training, research and marketing of specialty crops for Georgia growers. The fruit and vegetable industry in Georgia is valued at more than \$1 billion at the farm gate. This grant has helped to make Georgia producers more competitive and economically secure.

The grant had three project components which specifically addressed specialty crop producer needs.

#### **Project 1: Increasing Southeastern Specialty Crop Competitiveness by Equipping Growers with Food Safety Training, Production Education and Improved Risk Management Communications.**

- **Education:**

Educational programming was provided to give our Georgia and southeastern specialty crop growers information on changing marketing opportunities, new production practices in fruit and vegetable farming, and the diverse strategies needed to mitigate such risks.

Food safety operating procedures, audits, traceability and worker education are challenges fruit and vegetable growers face on a daily basis. This grant provided educational opportunities so growers could better understand food safety guidelines and new regulations. In addition, on-the-farm consultation was provided to help growers develop and implement effective food safety systems on their farms.

- **Industry Communications:**

Information - which provides knowledge - is the key to success in specialty crop production. This project expanded the GFVGA web site search engine and provided for a monthly direct communication to growers.

#### **Project 2: Increasing Fruit and Vegetable Market Share for Georgia Growers**

- **PMA – Fresh Summit:**

This project focused on using the largest trade show in North America to help expand the marketing of Georgia produce and increase the competitiveness of Georgia products

by bringing retail chains and foodservice company buyers together with Georgia produce growers.

**Project 3: Increasing Fruit and Vegetable Market Share for Georgia Growers by Promoting Nutritional Value of Locally Grown Products**

- **GEORGIA GROWN – local grown produce:**

Consumers are looking for locally grown produce that is healthy, tasty, nutritional and safe. The purpose of this project was for retail, food service buyers and consumers to be exposed to the GEORGIA GROWN brand and encourage them that Georgia produce needs to be available on the shelf, menu or in the bins as much as possible.

- **Farm Tours:**

In order to highlight the modern production techniques, food safety certified packing facilities, and discuss retail/food service needs, face-to-face meetings with growers were held. This grant brought together growers and buyers for constructive dialogue.

The goal of this project was to increase the specialty crop producer's competitiveness and market share through education and training. As outlined further in this report, the accomplishments and measurable results speak for themselves to the high level of success of this project.

**2. PROJECT APPROACH**

The approach of the project was to address each of the project areas as outlined in the Work Plan that was included in the initial proposal.

**Project 1: Increasing Southeastern Specialty Crop Competitiveness by Equipping Growers with Food Safety Training, Production Education and Improved Risk Management Communications.**

- **Education:**

Coordinate educational programming to ensure growers received the most updated information on production techniques, food safety regulations, traceability, new marketing programs, etc. This was accomplished with:

- Over 84 hours of educational programming at the SE Regional Fruit and Vegetable Conference; and
- Workshops, webinars, on-line presentations and on-the-farm training.

- **Industry Communications:**

Development of a search engine optimized web site and implementing a regular communication vehicle called 'THE UPDATE' which provided industry updates to growers on a regular basis.

**Project 2: Increasing Fruit and Vegetable Market Share for Georgia Growers**

- **PMA – Fresh Summit:**

GA produce and grower resources were promoted at the 2010 Produce Marketing Association Fresh Summit in Orlando, FL.

**Project 3: Increasing Fruit and Vegetable Market Share for Georgia Growers by Promoting Nutritional Value of Locally Grown Products**

- **GEORGIA GROWN – local grown produce:**

GFVGA partnered with four other commodity organizations (peach, watermelon, Vidalia onion and blueberry), to produce two, 2-minute info-mercials that aired on DELTA in-flight television.

- **Farm Tours:**

Two unique farm tours were held to bring growers together with retail buyers and school food service directors promoting 'farm to school' programs.

**3. GOALS and OUTCOMES ACHIEVED**

The overall goal of this grant was to help producers increase their competitiveness and increase the market share of their crops. The outline below is how each of the three projects contributed to this goal and how successful the grant was in meeting the goals as established by the measurable outcomes.

**Project 1: Increasing Southeastern Specialty Crop Competitiveness by Equipping Growers with Food Safety Training, Production Education and Improved Risk Management Communications.**

- **Education:**

The SE Regional Fruit and Vegetable Conference was held on January 6 - 9, 2011 in Savannah, GA with more than 2,330 people in attendance. This was a 5.6% increase in attendance over the 2010 conference. The conference had over 84 hours of educational sessions (See APPENDIX - Pages 1 -13) available to the attendees, and 90% of the attendees rated the cost of the conference to the value they received as good or excellent. In addition, 89% of the attendees said the time they spent at the conference when compared to the value of the education they reviewed was good or excellent.

**Performance Measurement:**

	<u>2010</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
Attendance	2,200	2330	+ -reached goal 5.6% inc.!!
Cost to Value rating	90%	90%	+ met previous year**
Value to Time	94%	90.4%	- did not hit goal **

\*\* during the 2011 conference a severe cold front hit much of GA's production area and many growers left the conference early explaining the lower % than desired.

The educational sessions at the SE Regional Fruit and Vegetable Conference were recorded and a DVD of all of the sessions was made available to growers – both those attending and those not attending. There were 30 farms/companies that took advantage of the full Conference recording offering.

In the original project Work Plan, there were five webinars proposed and two Regional Workshops to be held during the Spring and Summer of 2011 using the information from the SE Regional Conference. If this plan had been followed, five topics for the webinars would have had to be selected from the many different educational sessions recorded, limiting the availability of information to growers. Instead, it was decided to make all individual sessions available to growers for download. In addition, all of these sessions have been archived on the GFVGA web site for future reference by growers.

In lieu of the two Regional Workshops, it was determined an increased number of growers would be reached at the county level. Most county extension agents conduct educational meetings for their growers between January and March to provide the latest information on pest management, seed selection, marketing, and other risk management information. These meetings normally have 50 to 125 growers in attendance (total attendance for 2011 estimated to be around 700). The recordings and power point presentations from the SE Regional Conference were provided to the extension agents for use in their extension meeting. County meetings (See APPENDIX - Pages 14) held include:

Tift County	Berrien County
Brooks County	Lowndes/Lanier/Echols Counties
Colquitt County	Crisp County
Houston County	Decatur County
Rabun County	Toombs County

In addition to the County Production meetings, a number of food safety workshops were conducted by GFVGA's Director of Food Safety at other conferences and regional educational sessions utilizing some of the information from the Food Safety Workshop at the SE Regional Conference. Those additional meetings (See APPENDIX - Pages 15 - 30) included:

- January 19-20, 2011, Georgia Crop Advisors Workshop (100 attendees)
- January 24-25, 2011, National Sweet Potato Annual Conference (200 attendees)
- January 29, 2011, Georgia Watermelon Annual Meeting (75 attendees)
- February 11-12, 2011, Alabama Fruit and Vegetable Conference (200 attendees)
- June 14, 2011, GA Peach Council Food Safety Workshop (10 attendees)
- Sept 8, 2011, Wiregrass Blueberry Grs Assn Food Safety Workshop (40 attendees)

**Performance Measurement:**

	<u>Target</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
Webinars	5 subjects	30	+ -reached goal – 25 over!!
Regional Workshops	2	10	+ -reached goal – 8 over!!
Est. attendance	100	700	+ -reached goal – 600 over!!
Food Safety Wkshps.	None	6 -	+ - exceeded goal – 625 attn!

For this food safety education and training component of the grant, over 919 hours of on-the-farm consultation was provided to growers. During this consultation, GFVGA staff made sure the growers' SOPs (Standard Operating Procedures) had been updated, all systems were functioning properly and appropriate testing had been done on water, refrigeration, etc. As of 9/30/2011, there were 52 farms certified by the Georgia GAP Food Safety program in 2011. This is under the targeted goal as noted below. However, in addition to the standard GAP audits, GFVGA consultants were contracted to provide 130 mock audits of blueberry farm operations during the grant period of spring and summer of 2011.

**Performance Measurement:**

	<u>Target</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
Certified Operations	80	52	- below goal-see below**

\*\*We did not meet the 10% increase in the number of certified operations through the Georgia GAP Food Safety Program, as the industry demands for the supply chain changed in January/February 2011. Due to the more international nature of commerce, several of the large produce procurement and buyer groups have implemented a shift to accept Global Food Safety Initiative (GFSI) benchmarked audits. The GFSI standard is European in nature and covers not only the content of the audit checklist but the audit company protocols as well. This new shift goes beyond the single scope of food safety but incorporates sustainability, social practices, etc.

\*\* - con't. The Georgia GAPP audits are not GFSI benchmarked; therefore, several of our long standing clients and many potential audit clients who have used our consultation services were forced to pull their business with GA GAPP and go with other organizations. Since this evolution of food safety requirements, the GA GAP Program partnered with NSF Agriculture, a food safety standard owner, which allowed the GA GAP Program to offer consultation and audits for the GFSI benchmarked standard, GlobalGAP and GlobalGAP Primary Farm Assurance. By adding this new audit standard to the GA GAPP portfolio we were able to continue our services to the southeastern farmer.

- **Industry Communications:**

In this grant's application it was noted the GFVGA web site had 4,740 unique visitors since it was launched in January 2010 (790 visitors per month). Through the work on this grant, the web traffic increased more than 55% to over 1,240 unique visitors per month. Visitors to the [www.gfvga.org](http://www.gfvga.org) site averaged 2:39 minutes on the site with 2.91 average page views. Even after the first year of this grant, the web traffic continued to be measured and as of September 30, 2013, the site is averaging approximately 1,300 unique visitors per month with maximum months having visits of over 2,000.

The Performance Measure for this section of the grant was to establish a communication vehicle in which information could be directed to growers on a regular basis using the GFVGA web site as the depository of the information. During the summer of 2011 this vehicle was designed and content guidelines established, along with establishing graphic messaging parameters. On October 1, 2011, **THE Update** was launched with a 25.5% open rate. This is being monitored and we continue to improve the 'open' rate to as high as 28.7%. This is well above the industry standard of 21%. (See APPENDIX - Pages 31-41).

**Performance Measurement:**

	<u>2010</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
Web site monthly visits	790	1240	+ - exceeded goal
Establish Communication Vehicle		UPDATE launched	+ - DONE - met GOAL
Open Rate established		25.5%	+ -Increased-as high as 28.7%

**Project 2: Increasing Fruit and Vegetable Market Share for Georgia Growers**

- **PMA – Fresh Summit:**

The Produce Marketing Association 2010 FRESH SUMMIT was held in Orlando, FL on October 15-18, 2010. This is the world's largest and most valuable fresh fruit and vegetable event. FRESH SUMMIT had an attendance of over 17,000 attendees from 50 countries annually. The Georgia pavilion had 3,800 sq. ft. of floor space and 23 exhibiting firms. It was coordinated by the GA Department of Agriculture and GFVGA. (See APPENDIX - Pages 42 - 45).

The three-day show brought together produce industry leaders to see new products, strengthen relationships with current suppliers, and gather information for future purchasing decisions. The 2010 event offered Georgia producers a tremendous opportunity to market products and identify new outlets for their produce.

Companies exhibiting in the pavilion were asked to report new customer leads and increased sales. Based on the information reported, the companies that exhibited in the Georgia Grown pavilion at PMA averaged 3.4 new leads/contacts per company. The estimated increase in sales generated from these new leads and increased current customer orders was \$2.65 million.

**Performance Measurement:**

	<u>Target</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
New Leads/company	3.0	3.4	+ - exceeded GOAL!!!
Customer Sales Orders	\$2.0 M	\$2.65 M	+ - exceeded GOAL!!!

### **Project 3: Increasing Fruit and Vegetable Market Share for Georgia Growers by Promoting Nutritional Value of Locally Grown Products**

- **GEORGIA GROWN – local grown produce:**

The concept was to partner with other commodity promotional programs and increase the GEORGIA GROWN exposure among consumers. GFVGA partnered with four other commodity organizations (peach, watermelon, Vidalia onion and blueberry), to produce two, 2-minute info-mercials that aired on DELTA inflight television.

Following a meeting of all commodity association executives it was decided the focus of this project would be ‘in flight’ entertainment on Delta Airlines. Delta averages over 4.1 million passengers worldwide each month with access to ‘in flight’ entertainment. It was determined that a 2-minute info-mercial would be produced for Vidalia onions and blueberries to run on all Delta flights during the month of May. A second 2-minute info-mercial would be produced for peaches and watermelon and aired on all Delta flights in June. Each commodity association retained rights to the info-mercial so the clip could be aired on their web sites also. The info-mercials can be seen at <http://www.youtube.com/watch?v=sSTXjPuhqns> (May 2011 – Vidalia Onion and blueberry) and [http://www.youtube.com/watch?v=IGF-dl8HP\\_g](http://www.youtube.com/watch?v=IGF-dl8HP_g) (June 2011 – Peach and Watermelon).

Delta would allow only one web site to be listed in the info-mercial so a generic site was created [www.gagrown.us](http://www.gagrown.us). The promotion was initiated in May and June with 4.1 million passengers with access to ‘in flight’ entertainment. (See APPENDIX - Pages 46)

- **Farm Tours:**

Two unique farm tours were held to bring growers together with retail buyers and school food service directors promoting ‘farm to school’ programs.

The first farm tour would be considered to be a ‘reverse’ farm tour. During 2011 and 2012 there were serious food borne disease outbreaks with cantaloupes. Consumer confidence and retail desire for the eastern cantaloupe grown by most Georgia producers risked rejection from the buying community. As a part of this grant, GFVGA and other community organizations pulled together a group of 11 retailers and 17 growers from Georgia on February 1, 2013, to discuss this problem and how food safety was being addressed. While it was impossible to get all of these people together for a three-hour trip to a farm in south Georgia, they were willing to meet growers in a hotel near the Atlanta airport.

A second farm tour focusing on Farm to School initiatives was held at Jaemor Farms in Lula, GA on September 17, 2013. There were 16 in attendance including the Nutrition and Wellness Director for the GA Department of Education, the Director of Food and Nutrition from several county school systems, the Northeast Georgia Farm to School Consultant and a representative from the Habersham County Public Schools Farm to School Pilot Program.

The group was able to tour the 100-year-old farm and saw firsthand its involvement in fruit and vegetable production and agritourism. Jaemor Farms is involved with getting produce in local schools as a part of the farm to school program. The farm also hosts hundreds of school children yearly on farm field trips. Upon conclusion of the farm tour, the group discussed how school systems can increase the availability of local produce in schools across Georgia, with farmer and owner of Jaemor Farms, Drew Echols, leading the discussion. A number of the participants took home great ideas on reaching out to their local farms to increase local produce in their schools. (See APPENDIX - Pages 47)

**Performance Measurement:**

	<u>Target</u>	<u>2011</u>	<u>+ - 'REACHED TARGET/GOAL</u>
Increase Farm Gate Value	\$1.21 M	\$1.44 M	+ - EXCEEDED GOAL!!
2009 Farm Gate -	\$1.281M		
2010 Farm Gate -	\$1.203M		
FARM GATE values for 2012 is not yet available.			
FARM TOURS	10 buyers	17 buying orgs.	+ - EXCEEDED GOAL!!
		(23 buyers)	
	12 farms	18 farms	+ - EXCEEDED GOAL!!

**4. BENEFICIARIES and HOW THEY BENEFITED**

The beneficiaries of this project are the Georgia and southeastern fruit and vegetable crop producers who now have more education, training and management tools because of this grant. These tools will help improve their competitiveness and increase market share for them.

**5. LESSONS LEARNED**

There were a number of educational materials provided, lessons learned and training provided as noted in #3 above that will be of great benefit and value to Georgia producers.

**6. CONTACT PERSON**

Charles T. Hall, Jr.  
Executive Director  
Georgia Fruit and Vegetable Growers Association  
P.O. Box 2945  
LaGrange, GA 30241  
[chall@asginfo.net](mailto:chall@asginfo.net)  
706-845-8200

**7. ADDITIONAL INFORMATION**

Attached is a 47-page APPENDIX that provides background information, supporting documents, handouts, photos, and other materials that were produced as a part of this grant.

**4. Georgia Olive Farms – Olive Oil Development in Georgia – Final Performance Report**

PROJECT SUMMARY

The overall goal of this project was to determine and study the potential of Georgia becoming the primary olive oil producer east of the Mississippi. Georgia Olive Farms (GOF), an agricultural cooperative association formed for the benefit of specialty crop farmers, studied and developed the production of olive oil and table olives in Georgia. In order to accomplish the overall goal, methods of farming, optimal olive varieties, milling, oil flavor and marking for Georgia olives were established. Upon completion of the project, it was determined that there is good potential for development of an olive oil industry in Georgia.

PROJECT APPROACH

GOF approached the project objectives by finding and utilizing qualified consultants and by strongly relying on the personal services, equipment and land of the members of GOF. GOF utilized olive consultants in the area of farming, disease, pests, soil, standards, milling, olive oil

flavor and marketing. Coop members provided the land, olive trees, irrigation, fertigation and their own personal services.

A unique label and brand identity were established by use of a graphic designer and marketing efforts of the members. A website was developed (georgiaolivefarms.com). The lack of an olive mill east of the Mississippi was addressed and solved. Monitoring of existing orchards was conducted for disease, pests, growth, pruning and fertilization results. An olive tree nursery was established. Work was done in cooperation with the University of Georgia (UGA) to test varieties other than those traditionally associated with super high density plantings. A Chef's blend was developed. Experiments with different types of harvesters were carried out. A marketing consultant was utilized. Storage and transport methods were studied as well as packaging.

GOF participated in numerous educational sessions near the orchards as well as at the Southeastern Fruit and Vegetable Conference in Savannah. GOF members have made presentations at numerous seminars and meetings. Recognized experts have visited the orchards to observe and collect data. GOF has partnered with Okefenokee Technical Institute to establish an olive tree nursery to produce olive trees in Georgia. A test plot of traditional varieties of olive trees was planted on land of GOF members and monitored by UGA. From this test, it was determined that it is more difficult to grow traditional varieties than it is to grow the varieties that are recognized as suitable for the super high density method. With regard to fertilization, GOF has learned that the nitrogen requirements of olive trees grown at the GOF orchard in Lakeland, Georgia are less than originally anticipated and that use of chicken litter might provide the bulk of fertilization needed especially as the trees mature.

Olive oil produced in the 2011 harvest was tested and found to be extra virgin. There have been approximately 70 additional acres of olive trees planted since the project commencement.

#### GOALS AND OUTCOMES ACHIEVED

*The overall goal was to establish the viability of olive production in Georgia. That goal was accomplished. The acreage planted in 2009 has increased more than three times. Olives were successfully harvested in 2011 and were successfully milled, resulting in extra virgin oil marketed with a label that now has brand identity. The demand for GOF oil is more than can be met until more acreage is brought into production.*

Approximately 2-3 tons of olives were harvested from 30-month-old trees in September 2011, resulting in approximately .15 tons per acre based upon 20 acres.

Approximately 50 gallons of 100% Georgia oil were produced from the 2011 harvest. Although the harvest was good for 30-month-old trees, due to the great demand for the oil and the limited quantity, a special “Chef’s Blend” was made with a carefully selected California oil in order to meet the needs of more consumers.

Testing of the olive oil was done by a lab in Australia which is recognized to be the leading lab in the world on olive oil. Tasting tests of the oil were conducted by certified tasters in California and a tasting event was held in Savannah by a certified taster and consultant to the USDA olive oil lab in Blakely, Georgia. Although trees that were only 30 months old would not normally be harvested, GOF did harvest the olives as a part of this project in 2011 and the result was very favorable. *GOF’s goal of production in 2012 was not achieved due to unusual cold that occurred while the trees were budding.*

### BENEFICIARIES

Those who benefited from this project are: specialty crop growers, by having farming methods, harvesting, milling and marketing established before they invest in an olive orchard; blueberry growers who now have a fall cash crop to supplement their spring crop; investors interested in planting olives have more information at their disposal, as well as the extension agents from Georgia and Florida who have visited the orchard; consumers who have the opportunity to purchase GOF olive oil; chefs, who can now use Georgia grown olives and olive oil; and specialty shops who sell GOF olive oil.

At the beginning of this project, we estimate that there were only four active growers. There are now 12-15 growers. All of these growers directly benefited from the project.

All of the information generated from this project was shared with all of the active growers and potential growers. Georgia Olive Farm members received numerous calls every week from potential growers. The information learned is shared with all of these growers. Information was also shared at the Georgia Olive Growers Seminar in 2011, as well as the one held in 2012. In addition, information was shared at the Southeastern Fruit & Vegetable Growers Conference in 2012, held in Savannah, Georgia. The information was also shared at Georgia Organics meetings and at numerous local group gatherings, such as Lions Clubs.

In 2011, the Georgia Olive Growers Seminar had an estimated 150 attendees and the 2012 seminar had between 150 and 200 attendees. The educational sessions at the Southeastern Fruit & Vegetable Growers Conference in Savannah was standing room only with an estimated 200 attendees.

All growers stay in regular contact with Georgia Olive Farm members and are utilizing some or all of the practices and methods learned from the project. Georgia Olive Farm members share any new methods learned with all growers.

#### LESSONS LEARNED

GOF realized that with proper planning and execution, the potential for a specialty crop that has not been grown in Georgia in over 100 years can be determined. Traditional varieties of olive trees will be more difficult to grow than the super high density varieties and that less fertilization might be required than was anticipated. We also realized that there is great interest from farmers, USDA, and universities in the development of new cash crops.

#### CONTACT PERSON

Berrien Sutton, 172 West Dame Ave, Homerville, Georgia 31634, 912-550-5039.

#### ADDITIONAL INFORMATION

Using outside funding sources and not specialty crop grant funds, GOF purchased a small, state of the art, olive mill which was utilized for the small 2012 harvest. Plans are to purchase a larger capacity mill for the 2013 harvest which should last for several years. The smaller mill can be used for small acreage and for organic olive growers. The response from chefs, the media, specialty stores and consumers has been great. By 2016, it is anticipated that 110 acres will be in good production and that more acreage will be planted.

### **5. Georgia Agricultural Commodity Commission for Pecans – Georgia ACC for Pecans Health Campaign – Final Performance Report**

#### **Project Summary**

The funding for this project was used to continue the billboard campaign that creates awareness of Georgia pecans as being the healthiest nut available. The GA-ACC for Pecans is a producer-funded, self-help organization. Promotion of Georgia pecans is one of the areas that our organization, by law, is required to fund. The Healthy Billboard campaign has increased pecan sales and created positive responses from not only members of the GA-ACC for Pecans, but more importantly, consumers.

#### **Project Approach**

We contracted with Lamar Advertising and designed five attractive and informative billboards which were erected in key areas of the I-75 corridor and along I-75 in the Tifton, Georgia areas.

The billboard includes the official certification of the American Heart Association (AHA), stating that pecans meet the criteria for heart-healthy food. The billboards also have an up-close picture of a pecan with the words, "GEORGIA PECANS FIT! All Seasons All Reasons." (Please see the billboard at the end of this report.)

The AHA added Georgia pecans to its list of certified heart-healthy foods in 2012. After an extensive certification process, packages of Georgia pecan halves and Georgia pecan pieces now display the Heart-Check mark signifying its heart-healthy status. To be certified Heart-Healthy, products must be limited in added fats and carbohydrates, saturated and trans fats, cholesterol and sodium. They must also include at least ten percent of the Daily Value of one of six beneficial nutrients.

Also, the Food and Drug Administration (FDA) allows the following qualified health claim regarding pecans: "*Scientific evidence suggests but does not prove that eating 1.5 ounces per day of pecans as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.*" Our billboard states that pecans are "Heart Healthy;" we were careful not to make any unsubstantiated health claims, such as eating pecans will reduce heart disease.

In 2004, a USDA study confirmed that pecans are excellent sources of antioxidants, which are thought to fight cancer, heart disease and Alzheimer's. The study is found in the June 9 print edition of the *Journal of Agricultural and Food Chemistry*.

Approximately 55,000,000 cars per year drive by these billboards; that is a lot of daily exposure. We obtained feedback via email and telephone from the ACC-Pecans membership with regard to sales, and whether they have heard any comments from consumers regarding the health benefits of pecans. Pecan producers reported they had an increase in pecan sales where the billboards are located, and have received comments regarding how consumers were unaware of the health benefits of pecans until they read the billboards.

### **Goals and Outcomes Achieved**

One of our goals for this project was to increase sales and consumption of Georgia pecans. The target was to increase 2009's gross sales of \$126,000,000 by at least five percent. We far exceeded that target. The total sales last year was over \$200,000,000; this was due in part because of the high demand from both global and domestic customers.

We also wanted to create greater awareness that Georgia pecans are the top nut for antioxidants and that they provide many health benefits; that they are a good choice for any recipe. The billboards were designed in order to convey this information to every car that passed by. There was daily exposure to approximately 55,000,000 cars driving by. Measuring the awareness of the drivers and passengers within these cars is impossible; however, with that much exposure, we assume there is an increased awareness of some amount.

### **Beneficiaries**

The beneficiaries of this project were the 600 Georgia pecan growers, as well as the purchasers of in-shell and shelled pecans.

Georgia consumers, as well as out-of-state travelers, also benefited by their learning of the health benefits of pecans and how pecans can impact their daily diet.

### **Lessons Learned**

It was very difficult to obtain an accurate measurement of the specific impact of the billboards upon consumers. Even with an increase in pecan sales, it is difficult to measure how much of the increase is directly related to the billboards' message. Also, obtaining consumers' comments about educational benefits of the billboards is difficult. We did obtain comments from vendors close by each billboard regarding the impact upon their customers, but this is not a very scientific measurement.

### **Contact Person**

Duke Lane, Chairman  
Georgia Agricultural Commodity Commission  
for Pecans  
[dukelane@lanepacking.com](mailto:dukelane@lanepacking.com)

### **Additional Information**

Please see the billboard below.

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Product Size: 14x48

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Account Executive: Lyndi Sales - 229-580-5919

Wednesday, August 15 2012 D4

## **6. Georgia American Chestnut Foundation – American Chestnut Backcross Orchard – Final Performance Report**

### Project Summary

According to the USDA, National Agricultural Statistics Service (NASS), there were only 29 farms and 36 acres devoted to chestnut production in Georgia during 2007. That year, the United States imported 4,000 metric tons of chestnuts valued at \$10 million in 2007. Per capita chestnut consumption in the US is approximately 0.1 lbs. Should domestic consumption rise to 1 lb. per capita, the US would need over 100,000 acres of mature producing trees to meet that demand; this industry could be worth \$600 to \$800 million annually.

The Asian bark fungus, *Cryphonectria parasitica*, aka chestnut blight, has felled an estimated four billion American chestnut trees throughout its native eastern range. This blight has virtually eliminated Georgians' exposure to American chestnuts. What few chestnuts that are grown in Georgia and available in markets are primarily Chinese chestnuts. American chestnuts are widely viewed as sweeter, and generally superior in taste to all other chestnuts.

The American chestnut tree has been an essential component of the entire eastern US ecosystem. As a late-flowering and reliable tree, rural communities depended upon the annual nut harvest as a cash crop and to feed livestock; it was the single most important food source for a wide variety of wildlife.

The purpose of this project is to begin developing a tree that is American in character, but incorporates blight resistance from Asian chestnut trees. The method of plant breeding used to achieve this goal is called the Backcross Method. We utilized existing American trees which can be found within Georgia, to develop a hybrid tree which is highly blight resistant but maintains local genetic adaptations.

A collaboration between the members of the Georgia Chapter of The American Chestnut Foundation (GATACF) and volunteers across the northwestern part of the state, has helped to obtain regional breeding stock. This is a necessary step toward creating a self-sustaining breeding population of blight-resistant American chestnut trees.

The Ralph Henry/Berry College Backcross Orchard has been a critical component of this program.

With proper care and maintenance, including fertilization and weed control, it generally takes 5 to 6 years for a backcross orchard to reach the inoculation stage. Trees must be 1.5 inches in diameter (at breast height) before inoculation with the blight fungus. Inoculation is done in early

June of one year, and then blight-resistant trees are selected in late May/early June of the subsequent year.

### Project Approach

The GATACF's mission is to develop hybrid American chestnut trees that are blight-resistant and root rot resistant and that can survive and restore many viable American chestnut trees. The American tree flowers late in the spring, thus making it less susceptible to frosts, and therefore a reliable nut producer. A successful project would likely result in many of these chestnut trees being available for an expanded hybrid American chestnut industry in Georgia; this would create a new source of chestnuts for a growing consumer demand. The commercial and industry benefit is that American chestnuts for many people have a better and sweeter taste than Chinese chestnuts.

*The following excerpts from an Iowa nut grower's primer about the mostly Chinese chestnut industry in Iowa could be applied similarly to an American chestnut industry in Georgia.*

#### **“Chestnuts in World Commerce**

The history of chestnuts as a commercial crop goes back at least 5,000 years (corn only goes back 1,000 years). In all that history the supply has never been able to meet the demand. Chestnuts rank 3rd (among nuts) in the world, behind only coconuts and peanuts. Demand for chestnuts exceeds the demand for almonds and all types of walnuts, combined. Chestnuts are the 3rd most important food crop in China, behind only rice and wheat, and ahead of corn. All this suggests chestnuts are neither a fad nor a niche crop. The U.S. imports over 40 million pounds of chestnuts per year. Less than a million pounds are produced domestically. Most of the imports are livestock-feed grade nuts from Italy. Besides being poor quality to begin with, most of these nuts are moldy or even rotten by the time they arrive. Korea will probably begin importing large amounts of large but equally poor quality nuts within the next few years. It is reasonable to conclude high quality, good tasting, and locally grown chestnuts could out-compete and displace some of the poor quality but expensive imports. Growers in Southeast Iowa have been receiving between \$2 and \$4 per pound over the last two years (2000 and 2001), and had no trouble selling all of the crop locally.

- Demand for chestnuts is high, genuine, and long-term.
- There is no foreseeable danger of overproduction within at least the next 100 years.
- Prices paid for chestnuts have always been high, and are going higher.
- We can grow them in Iowa (and we are).

#### **Chestnuts as a Cash Crop**

Chestnuts have a lot of advantages as a cash crop for Iowa. Unlike most other nut crops, chestnuts tend to be heavy annual bearers (many other nut trees bear a good crop every other year, or even less). Worldwide, chestnut production tends to range between 1,000 to 9,000 lbs. per acre. We are conservatively estimating production in Iowa to reach between 1,000 and 2,000 lbs. per acre at maturity (it will probably end up higher). Net profits should range from \$1,000 to

\$6,000 per acre annually. Chestnuts can be grown on land which would be marginal for other crops. A few other advantages:

- Chestnuts could easily be grown without chemical fertilizers or pesticides.
- They can be grown and harvested without expensive or specialized equipment.
- Chestnuts are long lived (1,000+ years) so they only need to be planted once.
- Soil erosion from a well-managed chestnut planting should be at least 1,000 times lower than from no-tilled row crops.
- Chestnuts can be profitable even on a small scale. A farm family could earn a very good living on as few as 10-40 acres.
- Chestnuts have great potential for strengthening or even rebuilding rural communities.”

From ... **The Chestnut Grower's Primer**  
**Written and Illustrated By Tom Wahl**  
Published in 2002 by the  
**Southeast Iowa Nut Growers**  
**1st Edition**

The American Chestnut Hybrid Henry Orchard in Armuchee, Georgia, created an orchard of almost two acres that could grow several lines of hybrid American chestnut trees. Many Berry College student volunteers, GATACF volunteers, and Master Gardner volunteers worked to plant the 2011 chestnuts and the 2012 chestnuts in the orchard. In the first year, 497 chestnuts were planted; 97 chestnuts were planted this year. Two Berry College interns and the property owner worked to manage and maintain the orchard.

#### Goals and Outcomes Achieved

The trees would contain about 50% of their genes from pure American chestnut trees from the state of Georgia. Using nuts from 3-5 trees from Georgia, the plan was to develop 3-5 lines of hybrid trees that have characteristics of American chestnuts but are resistant to the blight fungus. Trees planted so far include at least 4 lines of different Georgia trees.

The soil on the site was prepared, an 8-foot high fence was installed to prevent deer from disturbing the trees, a ground well was dug, and an irrigation system installed. These improvements are still intact and functional and the site is being maintained by mowing, weeding, and watering when needed.

In 2011, volunteers planted 384 hybrid seeds and 113 other Chestnut seeds, both Chinese and American varieties, as controls. In 2012, we planted 97 hybrid Chestnut nuts to add to those previously planted. The 2012 low number of hybrid seeds was due to a lack of availability of hybrid trees to cross with American chestnuts in the Meadowview Orchard in Virginia. Of all the nuts planted, 201 have developed seedlings and are thriving.

#### Beneficiaries

The grant project is complete, as the objective to establish a backcross orchard has been reached. The long-term project is not yet complete, however, with regard to testing for chestnut blight resistance of our hybrid trees. This requires 3-4 years of growth before the trees can be challenged with the blight fungus to determine whether any hybrids have acquired the desired characteristics (American chestnut features but resistant to the blight). It will be 2014 before these trees will be tested for blight resistance by inoculating them with the chestnut blight fungus.

Potentially, the chestnut industry will profit greatly by having blight resistant American chestnut trees. A successful project should result in millions of dollars of economic benefit to nut producers, as well as providing consumers a much better tasting and sweet chestnut.

All actual and potential Georgia chestnut growers have been and will be invited to become members of GATACF; progress regarding this project is available through that organization's and the national organization's, The American Chestnut Foundation (TACF), outreach venues (websites, facebook pages, meetings, workshops, journals, newsletters).

The TACF Journal, the TACF public relations staff, and the Georgia Chapter newsletter, as well as our websites, [www.acf.org](http://www.acf.org) and [www.gatacf.org](http://www.gatacf.org) will include information on the progress of this project.

Our long-term plan is to cultivate this orchard for up to the next 26 years, adding more of the hybrid trees from five Georgia tree lines and testing them for resistance and using the promising ones to make it a chestnut seed orchard with these lines of resistant trees.

### Lessons Learned

In order to prevent weeds from overtaking the seedlings, we used a synthetic weed block fabric, which has been successful in preventing many weeds from growing. Lessons learned include monitoring and controlling for pests early in the season, especially for Ambrosia beetle.

We have not yet learned about the blight resistance of the trees because they are yet too young to inoculate with the blight-causing fungus.

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### Additional Information

[www.gatacf.org](http://www.gatacf.org)

Please see pictures below.



Henry Orchard – two pictures in 2011

Three pictures of Henry Orchard on October 31, 2012





## **7. Georgia Pecan Growers Association – Increasing Promotions of Georgia Grown Pecans – Final Performance Report**

### Project Summary

The Georgia Pecan Growers Association is continuously promoting Georgia pecans around the world. The Association designed promotional materials that were used at trade shows, health fairs, annual conferences, and pecan grower meetings held around across the nation and worldwide. The informational and interactive website continues to be an essential resource for beginning and new farmers and a tool to promote consumption and visibility of Georgia pecans. The following projects were undertaken to achieve the desired outcomes:

1. International Pecan Promotion
2. Domestic promotion and farmer education efforts

### Purpose

***International Pecan Promotion:*** The objective of this project was to increase Georgia pecan sales by participating in international trade shows. The Association recognized the need to educate and raise awareness of the health benefits and potential of the pecan in the

international market place as well as continuous promotion of healthy food choices. Participation in international trades shows enhanced one-on-one communication and interaction between vendors and buyers thereby increasing interest, familiarity and sales of the Georgia pecan. This project was a continuation of work undertaken in 2008 and 2009 after the realization that pecans were in demand at the world market. The Association increased efforts to promote and market pecan at the global level by conducting promotional campaigns in various countries which included China, India, Brazil, Canada, Israel, Spain and England. Participants traveled to these international destinations to showcase literature, which included nutritional brochures that were translated in Mandarin, Spanish, Arabic and Portuguese. The association also conducted one reverse trade mission, bringing a group of Chinese buyers to explore the Georgia pecan belt with the intention of increasing export sales of pecans.

***Domestic promotion and farmer education efforts:*** The objectives of the project were to enhance state and national, sales recognition and competitiveness of Georgia-grown pecans. Additional outreach, as well as awareness and accessibility to new and beginning pecan growers and farmers and disadvantaged groups of growers was achieved through conducting an annual growers conference that was aimed at increasing knowledge for beginning pecan farmers on pecan varieties, diseases and handling procedures. Materials on the website were designed to enhance grower knowledge and to market Georgia pecans to multiple stakeholders. A website is particularly critical and timely in a challenging national and global economic climate for Georgia pecans to successfully compete locally, state-wide, and around the globe.

### Project Approach

***International Pecan Promotion:*** The goal of this project was to increase the sales and publicity of Georgia pecans on the world market. To ultimately reach the anticipated global audience, the association participated in 7 outbound trade shows that were scheduled throughout the world in China, India, Brazil, Canada, Israel, Spain and England. Representatives from the association flew to the trade shows to meet with the in-country representative. Booths were set up to promote Georgia pecans by providing literature in the native languages, visuals, and pecan samples. A chef was available at many of the trade shows to demonstrate the cooking possibilities of pecans. Due to these promotions there has been a noticeably increase in the sales of pecans from 70 million pounds in 2008 to 85 million pounds in 2009 and 90 million pounds in 2010.

***Domestic promotion and farmer education efforts:*** The goal of education effort was to provide a platform for pecan growers to learn about current issues affecting the agriculture industry. Topics ranged from insects and weather related problems to marketing techniques. Pecan growers learnt about marketing of pecans and the various techniques needed to be adopted to increase sales and revenue. Topics covered included the following: assessment of

producer current marketing; developing a marketing plan; marketing strategies and direct market communications.

To increase public awareness of Georgia pecans, the Association promoted the website by directly contacting the members in the form of physical mailings, email blasts and notifications, and through the current quarterly magazine. The website was also promoted during the conference. The association launched a comprehensive, resource-based website, [www.georgiapecan.org](http://www.georgiapecan.org), to serve as a hub for many stakeholders in the pecan industry in Georgia. Continuous monitoring and maintenance of the site has increased the educational and marketing resources that are available to many farmers. The association has received more 231,000 visitors to the site since its creation in 2009 with monthly visits to the website ranging from 4,000 to 8,000 hits. We have not reached our goal of one million hits yet; however, we are on the way. The ultimate goal of creating connections between buyers and growers has been further enhanced by the creation of the website, with a Grower's section added.

### Goals and Outcomes Achieved

***International Pecan Promotion:*** Marketing activities during the past two or three years were designed to take advantage of and encourage the surge in international interest in the Georgia pecans and resulting sales. Marketing activities have also helped identify the major players in the global environment provided the opportunity to make a general assessment of the market; published appropriate flyers and brochures for world industry; and targeted in-store promotions. Increased presence has also provided the opportunity to discuss market development strategies with several of the major importer/distributors. The rapid growth of the Chinese market in particular continues to be sustainable as more and more people become familiar with the pecan. To ultimately reach the anticipated global audience, the association participated in 7 outbound trade shows that were scheduled throughout the world. Representatives from the association flew to the trade shows to meet with the in-country representative. Booths were set up to promote Georgia pecans by providing literature, visuals, and pecan samples. Trade show visuals included 10 x10 exhibit booth, table drapes, nutritional charts, Fun Fact sheets, portfolios for potential advertisers and business cards. Awareness of the 2010 pecan campaign continued to grow with each trade show.

Due to these campaigns, a record 90 million pounds of pecans were sold in 2010, versus about 85 million pounds sold in 2009. Most of this increase came from exports. Georgia could have sold more pecans, but that was all of our production.

***Domestic promotion and farmer education efforts:*** Upon completion of the conferences and seminars, pecan growers were able to develop and begin to implement a marketing plan, understand marketing risks, evaluate effective marketing strategies and implement strategies to improve their marketing efforts and aid in their ability to increase sales

and revenue. The ultimate goal was to increase the number of farmers exporting by 10%. By August 2011, a total of 52 farmers from 40 were exporting some of their pecan production to international markets which is an increase of 30%.

Continuous monitoring and maintenance of the site has increased the educational and marketing resources that are available to many farmers. The website was completed in April, 2009. Many emails were received requesting additional information regarding pecan purchases, planting of trees, association membership, and available grants. GPGA taken steps to address these requests and is constantly including new information on site.

### Beneficiaries

Many Georgia farmers have benefited from all the domestic and international promotional and marketing campaigns the association has conducted. Opportunities are available to the more 600 pecan farmers in Georgia. A total of 40 pecan distributors shipped their pecans to many international destinations in 2009 and that number grew to 52 in 2011. GPGA continues to educate farmers and provide information on marketing strategies and efforts.

### Lessons Learned

***Domestic promotion and farmer education efforts:*** Through the conferences and seminars, the association noticed the need for continuous education for the pecan growers. Growers filled out a questionnaire at the end of the conference and many noted the benefit from the knowledge gained and how it would positively impact their businesses.

The association launched a comprehensive, resource-based website, [www.georgiapecan.org](http://www.georgiapecan.org), to serve as a hub for many stakeholders in the pecan industry in Georgia. Below is a screenshot of the website. Continuous monitoring and maintenance of the site is critical to ensure that more educational and marketing resources are available to farmers, consumers and various stakeholders.

With the on-going development of social media, the GPGA will revisit our direct method of sending/acquiring visitors to our website. The GPGA is looking into possible future You-Tube videos to link to our website along with putting more emphasis on our web address at domestic and international venues. The GPGA plans to link our website to as many agriculture websites as permitted, especially the other 14 pecan growing states. As interest in the pecan market continues to grow, the feeling is our website will continue to grow with more and more hits.

***International Pecan promotion:*** Ever since pecan promotional and marketing campaigns have been introduced in China and many parts of the world, the pecan industry has seen a robust growth in export sales. These marketing efforts have given Georgia pecan producers new

avenues and means of promoting their products and has resulted in exposure to new buyers and distributors. The informational literature given out at all promotional activities have had lasting pecan awareness. Continual promotional and marketing efforts aimed at creating a larger customer base, are very much needed for the continued growth in export sales of pecans. From the food shows, it was evident that the association needed to continue educating the world market on the quality of Georgia pecans and define the differences in the product compared to other nuts currently consumed. Furthermore, it was evident that follow-up visits would be primarily important to build a personal relationship in these world markets. Marketing materials used during trade visuals were used to tell the story of Georgia pecans. The brochures and promotional materials translated into the different languages was a huge success as consumers could understand the message.

#### Contact Person

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### **8. Vidalia Onion Committee – Vidalia® Onion and Shrek Point of Sale – Final Performance Report**

#### **Summary**

The challenge of the Vidalia Onion Committee is that while consumer studies continually prove Vidalia onions are America's #1 sweet onion, there has been a proliferation of sweet onions on the market since Vidalia pioneered that retail category in the late 1980s. And, those faithful shoppers who have long been familiar with and purchased Vidalia onions by name continue to age. The Committee strives to familiarize younger demographics with the Vidalia brand and encourage them to purchase Vidalia onions specifically by name.

“The Packer” Fresh Trends industry research typifies yellow onion purchasers as 38-47, households with kids 13-17 or under six, and white onion purchasers as 18-37, households with kids under six. Conversely, that research shows sweet onion purchasers ages 48-57, households with no kids. Vidalias sweet onions fall into this bracket. The Vidalia-loyal boomer generation would have comprised young adults roughly 25-43 when Vidalia word-of-mouth first spread, the onions began getting national press, and finally won coast-to-coast shelf space. But, younger demographics including parents with children and children themselves are statistically less familiar with the Vidalia brand.

The Shrek/Vidalia “Ogres & Onions” partnership with DreamWorks Animation addressed this deficiency during peak harvest season to establish new loyal generations through an integrated

consumer and retail campaign targeting those consumers through on-pack marketing, point-of-sale, online consumer contest, in-store and consumer radio, national print drive, paid advertising, in-school messaging, and more.

## **Project Approach**

The Committee's marketing vision was to (1) find a marketing concept that appealed to kids (2) preferably involving an animated character, and toughest but crucial (3) that makes sense for onions. The Committee partnered with a marketer who discovered the fourth, final Shrek franchise installment, *Shrek Forever After*, was due in theaters at a time that correlated perfectly with Vidalia's seasonal harvest and national marketing push. Even better, Shrek in a famous excerpt discusses, "Ogres are like Onions!" and readily eats onions onscreen. The concept was enhanced with the "Shrek Forever After, Vidalias Forever Sweet" tagline to distinguish the Vidalia brand's uniqueness, and DreamWorks Animation approved the partnership that would lift sales and make the sweet onion pioneer relevant and appealing to new, younger generations. Not the first produce/character pairing but certainly the first and most unlikely with produce lacking innate appeal to children, yet offering a clear movie tie.

This first-ever Vidalia movie-themed promotion—"Shrek Forever After, Vidalias Forever Sweet"—was a complete, integrated national marketing campaign melding both consumer and retail elements. The program included extensive produce aisle consumer materials like "ogre-sized" floor stands & tear-off recipe pads, an online consumer contest, a national print and radio campaign, and an in-store radio drive featuring the "ogres & onions" movie clip—which Mike Myers had to personally approve. The Ogres & Onions campaign also featured Shrek-tacular, kid-friendly Vidalia recipes and in-school messaging promoting healthy eating with Vidalia onions via classroom posters and milk cartons.

Vidalia was of 15 Shrek national promotional partners. The VOC logo was on the DreamWorks "Partner Page" on [www.Shrek.com](http://www.Shrek.com) right next to Visa, Intel, Bank of America, General Mills, Con Agra Foods, Hewlett Packard, McDonalds, and other corporate marketing giants.

The campaign achieved sales lift partially by proactively encouraging producers, wholesalers, retailers to participate: "Shreked-out" *Sweet News* retail newsletter to educate retail decision-makers/wholesalers. Retail display contest, trade ads and releases, sales toolkits encouraged program participation.

Meantime, both sales and brand awareness escalated through the national consumer push: "Shrek-tacular, kid-friendly" recipe development/photography. First-ever, industry-wide

campaign packaging (Shrek bags/bins with kids' recipes, contest details). POS materials with campaign messages (price/shelf cards, tear-off recipe/content pads, first-ever box toppers and 5" Shrek floor stands). Consumer press, Mat, and radio (featuring Shrek voice) releases. First-ever POP radio spot. "Hunt 'n Peel" online contest revealed kid-focused Vidalia trivia. First-ever dedicated kids section on VidaliaOnion.org. Social media bolstering campaign messages to parents, children, bloggers. First in-school messaging: 30-million milk cartons with Vidalia messaging, separate online contest, "Shrek" prize packs. First-ever kids' brochure created Ag-in-the-Classroom compliant for school curriculum. First-ever classroom education poster. "Shrek" print ads.

## **Goals**

The primary objective of pairing Shrek and Vidalias was to capitalize on the appeal of the popular Shrek movie franchise to sell more Vidalia onions and increase consumer familiarity, particularly among younger consumers, with the Vidalia brand. Like ogres and onions, this objective has layers:

1. Utilize likeability of Shrek with adults, particularly parents trying to make smart food choices that also please their kids, who control purchasing power today to increase Vidalia sales short-term.
2. Associate Shrek imagery and appeal with the Vidalia name to establish and solidify Vidalia brand equity with future shoppers, particularly children and younger adults, to increase sales long-term.

To achieve these layers, the Committee set goals of increased packer and retailer program participation, consumer contest entries, POS distribution. With 70-percent of Vidalias sold loose, another measurable was to increase bagged onion sales through the use of Shrek imagery and kids' recipes.

## **Outcomes Achieved**

USDA Statistic Service reported Vidalia sales up 50% June 2010 vs. 2009 despite a 2-week season delay and 22% crop loss from weather. Bag sales jumped 30%. 14 of the top 15 top packers and the majority of the top-10 national retailers (by store number and sales volume) participated, plus regionals and independents. Many reported sales up over 12%. POS estimates in low thousands grew to 10-thousand floor stands, box toppers; 20-thousand recipe pads, shelf cards. Million-bag estimate actualized into 2.5-million, plus 11-thousand bins.

We more than reached our goal of a 10 percent increase in media impressions. ABC News and Fox Business stories: 6.8 million TV impressions. Front page WSJ and other print: 4-million+

impressions. Blogs and websites were saturated with positive parent feedback: Parenting.com, Psychology Today, LA Times, NY Post, Yahoo!Finance, About.com, CNN, etc. 55-million+ *web* impressions blew exponentially prior Committee record. Mat release: 11-million impressions, 2X the normal article count. This surpasses our 20 percent increase goal in web traffic. Radio release: 87-million+, 47 states. Online contest: 45-thousand entries, 5X record. WSJ & ABC alone valued at \$110-thousand—1/4 annual marketing budget.

### **Beneficiaries**

This project impacted the 100-odd growers and packers of Vidalia® onions by providing increased sales and brand awareness. Vidalia onions provide jobs for hundreds of farm and related industry workers in the 20-county growing region. Vidalias represent a third of all sweet onion sales nationwide annually, making them one of Georgia’s highest earning vegetable crops per farm gate value each year and a major influence on Georgia’s statewide agriculture and tourism economies.

### **Lessons Learned**

What do ogres & onions have in common? That’s the question posed to consumers by the Vidalia Onion Committee, and for the nonprofit marketing group, the answer was an eye-catching way to market an unlikely vegetable to children and parents. With a budget well under half a million dollars and a tiny marketing team, Vidalia launched a national campaign utilizing DreamWorks Animation’s Shrek that penetrated retail stores, lifted bag sales 30-percent, brought five times prior consumer contest figures, and landed the Wall Street Journal front page. The “Dream Team” turned real-life fairytale after scores of parents attributed their kids’ new eating habits directly to Vidalia bags bearing Shrek imagery and “Shrek-tacular,” kid-friendly recipes. W-S-J quoted a mother of three saying, “Gosh, I’m going through onions like crazy these days. It’s like buying milk.” From ABC World News to Entertainment Weekly, the story multiplied, and Vidalia gained “Ogre-sized” brand equity.

We learned that hard work and creativity can spell “happily ever after!”

### **Contact Person**

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### **Additional Information:**



# WHAT DO **OGRES** AND **ONIONS** HAVE IN COMMON?

"OGRES HAVE LAYERS. ONIONS HAVE LAYERS.

YOU GET IT? WE BOTH HAVE LAYERS!" - **SHREK**

**VIDALIA ONIONS**

**HERE'S THE SKINNY...**  
ONIONS ARE FAT FREE AND LOW IN CALORIES

**SA-SWEET!**  
ONIONS CONTAIN MORE NATURAL SUGAR THAN APPLES.

**SHREK FOREVER AFTER, VIDALIAS FOREVER SWEET**

**SUMMERTIME SWEETNESS...**  
VIDALIAS ARE AVAILABLE IN THE SPRING AND SUMMER.

**GEORGIA'S ON MY MIND...**  
VIDALIAS ARE THE OFFICIAL STATE VEGETABLE OF GEORGIA.

**AMERICA'S SWEET PIONEER...**  
VIDALIAS ARE THE FIRST SWEET ONIONS

Find fun activities at [VidaliaOnion.org](http://VidaliaOnion.org)

**SHREK FOREVER AFTER 3D**  
ONLY IN THEATERS



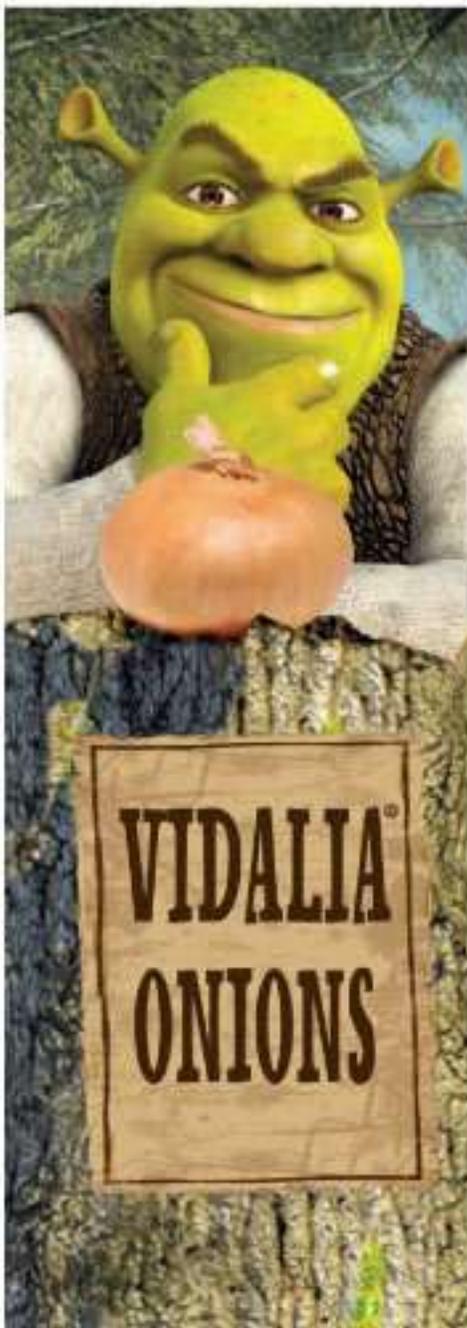
welcome to the vidalia®  
**America's Favorite**  
**Sweet**

[about us](#)

[recipes](#)

[healthy eating](#)

[farming](#)



**WHAT  
OGRES & ONIONS  
HAVE IN COMMON  
LAYERS OF ALL**

HAVE A RI-DONK-ULOUS GOOD TIME  
WITH **VIDALIA** ONIONS!

-  [Hunt & Peel trivia game with ogre-sized prizes!](#)
-  [Coloring pages](#)
-  [Vidalia fun facts](#)

## **9. Georgia Green Industry – Irrigation Water Use, Economic Value, and Recycling Research for the Green Industry in Georgia – Final Performance Report**

### **Project Summary**

This project made it possible for the Georgia Green Industry Association (GGIA) to survey the green industry to assess the economic value of the industry as well as the current plastic recycling activities participated in or needed by wholesale nursery growers throughout the state. The economic value of the state's third largest commodity needed an update from the statistics produced in a 2007 survey because the challenges of the long-term drought and the status of the economy have drastically impacted Georgia's green industry. Additionally, in order for Georgia's nursery growers to become sustainable producers, new plastic recycling vendors must be recruited to operate in the state. A survey to determine the current recycling practices of nursery producers was needed to produce statistics for recruitment of recycling vendors. The research and statistical reports produced by this survey will enable GGIA to better advocate for policies and projects that benefit producers, thereby providing employment opportunities in the rural and farm sector of the state as well as addressing the needs of the urban and environmental sectors of the industry by finding viable plastic recycling outlets.

The partners in the survey project included two staff members of the Georgia Green Industry Association, a researcher and an administrator at the Center for Urban Agriculture at the University of Georgia's Griffin Campus, and the Horticulture Extension Specialist at the University of Georgia in Athens.

The partners in the recycling pilot program included the Georgia Green Industry Association and Griffin Greenhouse Supply in Ball Ground, GA.

### **Project Approach**

Prior to starting the survey development process, a review of the Irrigation Study conducted in 2002 by the Center for Applied Nursery Research and the 2007 Economic Value survey from the UGA Center for Urban Agriculture was conducted to determine methodology and data collection procedures.

It was decided by the project workgroup that one survey, rather than two separate surveys, could be conducted to assess both the economic value and the recycling activities and needs of the green industry. Since the decision was made to include only one survey, the work plan shifted to approximately 6-8 months later than dates identified in the original plan.

At the time the review was being made, another committee determined the marketing program for the survey. It was decided that email newsletters, postcards, and a letter with a written survey would be the vehicles for disseminating the information for the request to complete the survey.

Survey methodology was determined and survey questions were then prepared, reviewed, and revised as necessary. The workgroup also developed on-line protocol for the survey and data collection. These areas of work were completed in between Spring 2012 and December 2012.

The marketing plan was then implemented and a cover letter was developed for the written and mailed survey. At GGIA's annual Winter Green conference in January 2013, the survey was discussed in several meetings and sample copies were shared at the GGIA exhibitor booth with many individuals in the industry. Announcement cards were distributed to many attendees at the WinterGreen conference. The mailed copy was sent in early February 2013 and e-mail copies of the survey and request letter were sent several times over the next few weeks.

After a time period of over 3 months, the initial data review and statistical analysis took place of the surveys received. Comprehensive data analysis was then performed and a final report prepared to be shared with the industry in several meetings beginning in January 2014 through March 2014. Additionally, the economic data will be shared with The Essential Economy Council to be utilized in assessing the growth potential of the green industry in rural and farming sectors across the state.

During the time spent developing the survey, methodology and data collection and analysis, GGIA was also working on a test program for the recycling of plastic materials. GGIA partnered with Griffin Greenhouse Supply in Ball Ground, GA. The pilot program included a free pick up of palletized plastic for recycling. Over the course of the pilot program, a vendor was located to receive and recycle the horticultural plastic materials. Recycling of green industry materials proves to be difficult as the plastic pots are not clean and available for immediate recycling. Often vendors do not want the plastic materials because of the soil contamination.

The project was delayed when the decision was made that in the interest of time spent and participation in surveys by the industry, only one survey should be conducted with both the economic value and recycling questions. The one survey was timed so that large amounts of pre-survey promotion could be implemented at the GGIA WinterGreen conference and trade show in January 2013. The final report is now finished and will be presented at meetings held during the 2014 WinterGreen show on January 22-24, 2014; at the Waycross event "Southeast Landscape Area Talks" on February 6, 2014; and at the Macon event in March 2014. The report will also be presented within the January 2014 edition of *The GGIA Journal*. Additionally, it will be submitted for inclusion in the *Journal of Environmental Horticulture*, a national publication for academic horticultural professionals.

The project was successful in assessing the recycling activities of the green industry and the pilot program greatly increased the opportunities for the green industry to recycle horticultural plastic. The project was also successful in determining the scope and economic value of the green industry and provides reliable data to allow GGIA to appropriately represent the state's third largest farm-gate value commodity in advocating for policies and projects that benefit producers, provide for year-round and seasonal employment in the rural sector and meet the needs of the both the urban and environmental sectors of the state.

## **Goals and Outcomes Achieved**

**Goal:** Increase the amount of recycled products from the green industry by a minimum of 25%.

**Outcome:** Through the pilot program set up with Griffin Greenhouse Supply, there have been three tractor-trailer loads of horticultural plastics that have been recycled. These are plastic items that would have been taken to the landfill. This amount of recycled plastic easily fulfills the 25 percent goal (*the majority of firms were only recycling about a dumpster full each quarter*); however, the program has been implemented for approximately a year and we are still working to promote the program with growers and landscapers around the state. When the final results of the survey are released and printed in the GGIA Journal, Fall/Winter 2013 edition, we will continue to campaign for the program to increase the amount of plastic recycling. The three tractor trailer loads are just the beginning of a long-running project that Griffin Greenhouse Supply and GGIA will partner to ensure that the green industry has an outlet for recyclable horticultural plastic. *Please review the **Executive Summary** later in this report.*

**Goal:** Present the findings of the economic survey to at least 150 green industry stakeholders at a minimum of three meetings.

**Outcome:** The results of the combined economic and recycling survey will be released in a seminar held during the GGIA WinterGreen convention during January 2014. The results were delayed as the project combined the two surveys and the release date was later than originally planned. Survey results will be shared in the “New Plants” session at the conference as this class historically has 80-100 participants and is the most attended single session that is offered at the conference. Additionally, the survey will be released in the Annual Business Meeting. This meeting historically has approximately 40 people in attendance. In the Chapter Orientation meeting, also held at the conference, the survey results will be released to approximately 20 people.

Additionally, time is scheduled on the agenda for release of the information at the Southeast Area Landscape Talks (SALT) on February 6, 2014. These seminars have a historical average of 95 attendees from southeast and coastal Georgia.

Through these meetings, approximately 235 people will be personally receiving the data analysis and survey results handouts and well as have opportunity to hear of the program during the seminar or meeting.

The results handouts will also be in the GGIA exhibit booth at the show. There are on average five quality contacts per hour of trade show exhibition. Through this outlet, we expect to reach 70 people.

**Goal:** Release survey findings in the *Georgia Green Industry Association Journal* as well as other publications.

**Outcome:** The final report of the survey has been prepared by the University of Georgia Center for Urban Agriculture and it will be published in the Fall/Winter Edition of the GGIA *Journal*. Additionally, the report will be presented to the Urban Ag Council and the Southern Nurserymen's Association for printing in their publications. Finally, the report will be presented for review by the *Journal of Environmental Horticulture*, a national publication for academic horticultural professionals.

### **Executive Summary**

Using the verified list of the environmental horticulture firms located in Georgia, including the GGIA list, a survey on issues important to the industry was implemented between January and March 2013. A total of 241 firms responded to the survey, a response rate of 27.2%. The majority of respondents were located in the Atlanta metropolitan statistical area.

The responding firms appear to represent both small and large firms in terms of revenues and employment with relatively fewer medium size firms. With few exceptions, all firms offered above minimum wages at entry level positions and the majority required up to five months of employment at that level. For managerial or supervisor positions, the majority of firms required up to 12 months of employment, with applicable higher wages. Few firms employed seasonal workers and about one third planned to hire new employees in 2013. The vast majority of firms were concerned about the general economic situation, housing and labor markets, and the ability to find qualified employees. The majority of firms (55%) expected their sales revenue to grow up to 10% in 2013, although the growth rate varied widely. Overall, the economy and labor availability remain important concerns, while the offered wages and the period of employment at the entry level positions is relatively short, offering opportunities for increased wages. The majority of firms expected their sales revenue to grow in 2013, but at a relatively low rate.

The majority of firms (80%) recycled unneeded materials, although the proportion of specific materials varied. Pesticides and metal were recycled in the largest proportion, but overall plastic materials were recycled in larger proportion than non-plastic materials. A number of constraints to recycling were confirmed by the responding firms and the physical effort to ship and sort were named most often (at least 90% of firms). Firms would be better motivated to recycle if they would not to be charged for picking up materials that the recycling company later sells (71%). About two-thirds of firms acknowledge that they were disposing materials that could be recycled. The recyclable materials that are currently disposed include plastic and non-plastic materials. *The majority of firms dispose at least one dumpster of recyclable material per quarter.* Overall, firms would recycle even more than they currently do if the recycling firms would make additional calls at no cost to companies, would not charge for collecting materials

they later sell, would reduce sorting requirements, and would keep their clients better informed about the offered services.

The respondents were predominantly owners or managers in the firm (82%) and 77% were males. The majority had at least 16 years of experience in their business and had at least a high school education (81%). The age of the largest portion of respondents ranged between 46 years and 60 years. Overall, respondents had substantial experience, were well educated and were older than 50.

### **Beneficiaries**

The beneficiaries from this project include all of the member companies of GGIA as the data will be used to more effectively advocate for the needs of the industry with regard to water and economic development. Additionally, the recycling program begun by this project will assist the entire horticulture industry in providing an efficient outlet for plastic recycling. There are 655 licensed nursery producers and 3,099 plant dealers and landscape license holders in Georgia.

### **Lessons Learned**

The decision to produce only one survey rather than two delayed the development of the project. However, all facets of the project are now complete with the exception of the printing of publications for the report and the public release of the report at the annual convention in January 2014.

### **Contact Information**

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## **10. Georgia Christmas Tree Association – Christmas Trees, Georgia Marketing Campaign-Final Performance Report**

### **Project Summary**

This grant made possible a state-wide marketing campaign to boost the sales of Georgia-grown Christmas trees. The campaign involved the development and printing of a “Choose-and-Cut

Christmas Tree Guide” and a 15-minute video showing the story of Georgia grown Christmas trees.

The Choose-and-Cut Christmas Tree Guide lists each farm and what each has to offer (e.g., varieties of trees, activities for kids, etc.) as well as a picture and brief description of the most popular tree varieties sold in Georgia. It includes the names and locations of our 66 Georgia Christmas Tree Association (GCTA) members across the state. It also includes a Georgia map with the farm locations marked. The guide was distributed to 158 Georgia Farm Bureau offices, GCTA members, and 60 welcome centers across the state.

The 15-minute movie-quality video entitled, “Georgia Christmas Trees—The REAL Story,” displays the life of a Georgia-grown Christmas tree. The video was filmed at a local farm and documents the entire process of growing, selling, and caring for a live Christmas tree. Over 300 copies were distributed through the Farm Bureau offices as well as GCTA members, schools, chambers of commerce, and local fairs.

### **Project Approach**

The biggest challenge that Georgia Christmas tree farmers have faced over the last ten years is marketing and attracting new customers to their farms. GCTA wanted to familiarize as many Georgians as possible with choose-and-cut Christmas tree farms in their area. With so many new Georgia residents, we needed a uniform marketing tool to promote the trees. Both the brochure and video have been extremely successful by its use at fairs, trade shows, schools, and farms.

### **Goals and Outcomes Achieved**

The overall goal of the project was to increase the number of Christmas trees sold at choose-and-cut farms in Georgia. The number of phone calls to the GCTA has doubled over the past three years, to a total of approximately 750 during the 2012 season. Hits to the GCTA website have also increased three-fold to a total of 37,800 during the 2012 season. The average increase in sales over the last three years is approximately 12 percent, based upon the information reported on the GCTA website by its members.

### **Beneficiaries and How They Benefited**

Because of the increase in sales of Georgia grown Christmas trees, the 100 plus growers benefited from the increased awareness as a result of the project. It was important that we market our product on a large scale in order to inform the numerous new citizens to our state. Educating the public in Georgia about local grown Christmas trees was very important in order to provide the information necessary to attract additional business to the choose-and-cut

Christmas tree farms. The increase in the sales of Christmas trees also helped the families in Georgia establish a Christmas tradition that will create memories for many years to come.

### **Lessons Learned**

Both the brochure and the video proved to be very labor intensive. Information research for the brochure and filming of the video was very time-consuming. Both patience and perseverance were necessary tools. Overall the project was a success and the benefits will be reaped for many years to come.

### **Contact**

Chuck Berry, Past-President  
Georgia Christmas Tree Association  
770-602-6003  
[berrystreefarm@gmail.com](mailto:berrystreefarm@gmail.com)

### **Additional Information**

Please see the brochure, "Georgia Christmas Trees—The REAL Story," below.



## **11. Georgia Agricultural Commodity Commission for Peaches – Increasing Georgia Grown Peaches Market Share – Final Performance Report**

**Project Approach-** For the 2011 peach season, the Georgia Agriculture Commodity Commission for Peaches was awarded \$45,000 from the Specialty Crop Block Grant. In addition to the grant money the GACC for P, Georgia Peach Council and its growers contributed an additional \$100,000 out of pocket to further stimulate the initiative. Funds received in 2010 were used to continue to re-establish Georgia as the peach state and solidify Georgia Peaches as the preferred brand in the south. With the continued threat from California and an increasing threat from South Carolina, the remaining peach growers in Georgia have created an aggressive initiative aimed at preserving the title as ‘The Peach State.’ The 2011 season was as successful from a sales and marketing standpoint as any in recent memory. Georgia growers collaborated together during the season to ensure retailers (and customers) received premium Georgia Peaches throughout the season.

**Project Summary-** Below are the major initiatives undertaken by the Georgia Peach Council in 2011

1. Designated a spokesperson for the industry to speak on behalf of and be an industry advocate to the general public of Georgia Peaches.
  - a. Partnered with Gena Knox to be the face of Georgia Peaches.
    - i. Gena was featured on two nationally televised morning shows, including the CBS early show.
    - ii. In addition to the above, Gena was featured in a well-known Atlanta morning show in a 4-minute cooking segment promoting Georgia Peaches.
    - iii. The Georgia Peach Council also utilized Gena to customize how-to videos for storage and recipes using sweet Georgia Peaches for their website [www.gapeaches.org](http://www.gapeaches.org).
2. Continued to develop our presence in Atlanta and have consumers always ask for sweet Georgia peaches. **(\$25,000)**
  - a. For the first time ever, each commercial packer/grower in Georgia shipped peaches directly into the two major retailers in Atlanta (Publix/Kroger).
  - b. The 55,000 peaches that growers donated and were handing out at the Peachtree Road Race were quickly gobbled up with an estimated 5,000 runners yet to cross the finish line.
3. Developed customized sales materials highlighting Georgia Peaches and their unique attributes. **(\$5,000)**
  - a. Provided shelf talker for Publix Supermarkets.
  - b. Created a brochure highlighting Gena Knox and Georgia Peaches.
4. Expanded market focus from Georgia into Florida. **(\$15,000)**

- a. Georgia Peach Council procured 11+- full-size billboards on major thoroughfares in Tampa and Orlando Markets.
- b. Hired PR firm Sahlman Williams to emphasize Georgia Peach brand to Florida consumers (used GPC spokesperson Gena Knox to execute).
- c. Three Georgia growers funded additional marketing efforts to complement GPC efforts in Tampa and Orlando.
- d. Georgia growers provided ALL Georgia Peaches when available to Winn Dixie and Sweet Bay, both of which were exclusive users of California peaches.

What a year for Georgia Peaches! Momentum from 2010 inspired an even better 2011. Georgia Peaches were sought by consumers and, in turn, buyers throughout Georgia and parts of Florida. Growers mutually agreed on the success of the 2011 campaign. Future plans include a continued focus in Georgia and a bigger more aggressive campaign in Florida in 2012.

### **Goals and Outcomes Achieved-**

**Expected Outcome 1-**Growers expected an increase in the number of Southeastern retailers participating in the Sweet Georgia Peaches placement program.

**Actual Outcome-**Outside of having all 4 commercial packers ship into Publix and Kroger Atlanta in the 2011 season, growers felt a HUGE sense of accomplishment with the partnership of Winn Dixie and Sweet Bay. For the first time ever, Sweet Bay AND Winn Dixie utilized Georgia Peaches exclusively the entire time they were available. Winn Dixie (a 300 store Florida retailer) nearly tripled their usage of Georgia Peaches in 2011 over the prior. Sweet Bay (a 100 store Florida retailer) increased their usage 100 percent, roughly 40,000 cartons. Both Winn Dixie and Sweet Bay sold only Georgia Peaches when they were in season. Fruit offered was premium, as was pricing.

**Expected Outcome 2-**An increase in the number of loads shipped into the Southeastern market during June/July '11 compared to '10.

**Actual Outcome-2** Total number of loads shipped into the Southeastern market increased considerably. Overall crop size was large in 2011 AND there was significantly more demand of Georgia Peaches into southern markets...especially Georgia and Florida. Winn Dixie and Sweet Bay accounts alone contributed to an increase of an estimated 100,000 cartons or 65 loads.

**Expected Outcome-3** A slight increase in the price per unit in 2011 compared to 2010.

**Actual Outcome-3** Growers recognized a HUGE increase of anywhere from \$1.50-\$2.00 per carton unit in 2011 vs. 2010. This represents that total sales of Georgia Peaches rose by approximately 15 percent. Much of that increase was due solely to the size of the crop. Normally when growers have a large crop, lower prices are reflected. The \$2+ price increase, in

spite of a bumper crop, signifies how successful our marketing campaign was. The funds provided by the Specialty Crop Grant played a significant role.

**Beneficiaries**-Georgia Peach growers and members of the Georgia Agriculture Commodity Commission for Peaches undoubtedly recognized the largest benefit. This season proved to be very successful for all growers of Georgia Peaches. One important accomplishment we recognized this season over previous seasons was market pricing of Georgia Peaches being consistently higher than that of equal size and quality of South Carolina or peaches from other states. In addition to growers, retailers who chose to support the Georgia Peach program also reported fantastic success.

**Lessons Learned**- Overwhelmingly, the best lesson learned from the 2011 campaign was the value of successful marketing. The results in Florida have inspired Georgia growers to consider an increase in promotional out-of-pocket dollars to further increase our presence in Florida. Unfortunately, we missed the deadline for the 2011 grant applications, but will continue the marketing efforts and hope to be considered for funding again in 2012. Funds from the Specialty Crop Grant and promotional out-of-pocket dollars have created cohesion among growers like never before. Growers now realize there are only a limited amount of Georgia Peaches available and with help from the Specialty Crop Grant funding and a strategic promotional campaign, growers will ensure favorable returns for the foreseeable future.

**Contact Person**- Duke Lane III; [duke3@lanepacking.com](mailto:duke3@lanepacking.com); 478-825-2891

## **12. Emory University – Georgia Crops at Emory: Cooking, Catering, and Market Expansion – Final Performance Report**

### **Project Summary**

The USDA Specialty Crop Grant was used in 2010-11 to build consumer support for Georgia horticultural crops, through four component activities: the Educational Garden Project, the campus farmers market and its special events, the Sustainable Food Fair, and development of a brochure of practical guidelines for catered events. Emory University's many sustainability-related efforts have stimulated change across the state—and even the nation—and through the four areas of Emory's Sustainable Food Initiative supported by this grant, we have worked to expand public awareness of the benefits of local, sustainable fruit and vegetable consumption.

### **Project Approach**

#### **Educational Garden Project**

The goal of this component of the project was to expand hands-on gardening knowledge and to expand awareness of Georgia specialty crops. The Educational Garden Project consisted of eight small, attractive food gardens along sidewalks and in other well-trafficked locations around campus. Garden teams were recruited each year from faculty, staff, and students. The Garden Coordinator, Judith Robertson, was responsible for weekly educational and work sessions with garden teams, coordinating delivery of plants and amendments, and overseeing the garden sites. Judith coordinated information tables about the garden project at a series of campus and community events, which also spread the word about Georgia horticultural crops, garden feasibility, and opportunities to participate.

### **Farmers Market and Special Events**

This component supported publicity for our increasingly robust weekly campus farmers market, where the presence of local, sustainable farm products allowed consumers ease of purchase, an opportunity to learn about local products, and greatly expanded market momentum for Georgia horticultural crops. Julie Shaffer was the market manager, and she worked this year to recruit new farmers and carry out a series of special market events over the course of the year, to highlight specific Georgia products.

### **Sustainable Food Fair**

This component offered a lively Fall fair for the broader Emory community, with music and educational activities around sustainable food and booths staffed by local chefs highlighting Georgia produce, farmers with food to sell, local stores and cooperatives offering information and samples, and booths as well by nonprofits who help spread the word about local and sustainable food. The fair was considered by many to be a highlight of the academic year, and thus knowledge of Georgia specialty crops and the importance of eating locally and seasonally were brought home in creative ways to students, faculty, and staff. The Fair was held on October 1, from 10:30-1:00 in the center of the campus and the effort was spearheaded by a group of students from the Anthropology Department.

### **Practical Guidelines for Catered Events**

For this part of our project, we were aware that one area of significant expense for students as well as employees comes from catered events, whether a special party, a dinner meeting, or a reception after a speaker. By developing an easily-shared brochure that encourages the use of healthy, local foods, university office managers and student groups became aware of another decision point in which they could purchase Georgia horticultural crops.

### **Goals and Outcomes Achieved**

## Educational Garden Project

Our first goal was to establish one additional garden, bringing our total to eight. This was accomplished at the Candler School of Theology site. This well-trafficked location beside a major sidewalk attracted considerable attention, and the funds from the grant allowed the group to have a compost bin, hoses and shovels, planting materials, and mulch over the course of the year. Reported the new Theology garden leader: "Faculty and staff have responded with, 'we took some of the tomatoes from the garden they were the best.'" We have had a cucumber plant take over ... with wonderful lemon cucumbers. One of our students said he made wonderful gazpacho with it!" Passersby asked about garden growing tips as well as about the vegetable crops in place.

Judith Robertson, as proposed, served all the gardens diligently as the Coordinator. Visiting them each week and often contributing to the weeding and transplanting efforts, she offered hands-on education to the hard-working volunteers, expanding awareness of how to grow Georgia horticultural crops. Judith assured that each garden has one or two team leaders, and email coordination of the teams and their queries was excellent this year. All eight gardens have had well-functioning teams, with some Emory staff members, assuring that gardens receive care in the summer months, when students are gone. This strong organization means that work team members were eating the produce from the gardens, and learning about the superior taste of locally-grown crops. One garden leader said, "After looking at our blueberry bushes, one passer-by said, 'I've never seen how blueberries grow before. My son and I are going to plant some at our home now! Do you have any tips?'" Another garden leader said, we "produced an abundant crop of spring and summer vegetables. The strawberries were the biggest hit of this garden in early spring, we could not pick them fast enough! Also we had great success with cabbage, cauliflower, kale, peas, asparagus, basil, and more."



Depot Garden in full flower

New Theology Garden doing well



In addition, Judith coordinated seven events featuring the garden during the course of the grant (see Appendix 1 for a list of these events). The events were very well attended and the garden project was highly visible. Sunflower seeds and Indian popcorn seeds harvested from the gardens were distributed to attendees, generating considerable interest along with pictures of the gardens at their peak. This number of events was slightly fewer than last year, but the quality was higher. We think the gardens are now so well-established a fixture of Emory that many organizations no longer need an introductory session to them. The garden planning dinner offers a frugal bean soup meal and great camaraderie, serving an important role in building rapport among the teams and incorporating new members.

### **Farmers Market and Special Events**

Our Farmers Market events expanded this year and gained increased popularity. We were blessed by good weather, as well. Seven major events focused on turnips, sweet potatoes, berries, peaches, watermelon, tomatoes, and pumpkins.



Poster of summer special events

Poster for winter root crop event.

In addition, our weekly Farmers Market really hit its stride. **Attendance was up sharply. Julie Shaffer, the market manager, estimated attendance at 2,000 passersby each week and 400 buyers on average (up from 75-125 buyers last year, which was more than our 15 percent goal).** Vendors numbered 11, up from 5 last year. Sales comparisons were possible only for continuing vendors—newcomer vendors could not be compared with the previous year’s sales. Of those who continued, some reported holding their own in sales, and some reported sharply increased sales. At least one doubled sales from the same months last year and another tripled sales. All of these figures greatly exceeded our goals for the grant period. We think the banners and other publicity were critical to helping people remember to come out and buy at these markets. All the events and the existence of the market itself built momentum for Georgia horticultural crops among consumers.



Georgia sweet potatoes at our Thanksgiving feast



Berries for sale from Berry Bash.



Produce for sale at one market stand



Crowds at the market stands.

### **Sustainable Food Fair**

The Sustainable Food Fair was once again a terrific success this year; attendance (and weather) was great, crowds were excited, and vendors were very pleased. There were nearly 40 booths, highlighting efforts to build a sustainable, local food system for Georgia. Chefs from 4<sup>th</sup> and Swift, Avalon Catering, Dynamic Dish, Farmstead 303, Farm Burger, L’Thai, Nectar, Zocalo offered free samples (such as butternut squash soup, greens, or veggie wraps) and featured specific farmers’ produce, thereby teaching attendees about the direct links in the farm-to-table movement in Atlanta. Farmers sold vegetables, fruits, and value-added products, such as jams. Organizations such as Georgia Organics, EPA and the Oakhurst Community Garden helped attendees see the full range of issues around food security and a sustainable, local food system.

Two booths provided by Emory students were particularly important for education. One featured a diagrammed “trail” of how vegetables get from farm to table, showing expenses and environmental costs of long-distance food transport. Students explaining the trail emphasized the importance of buying local produce. Another table offered passersby a quiz on which of the

displayed fruits and vegetables were seasonal Georgia crops. This table offered a chance to win a prize (see picture below). Other displays, posters, and surveys also explained key concepts of local and sustainable food. ***Both the anthropology student assessment of the Fair and the Business School assessment felt that the fair expanded awareness of Georgia specialty crops and the importance of eating locally and seasonally.***



“Which fruits and vegetables are seasonal, local produce?”

Some produce from the Fair

***One new part of our grant this year was partnering with a class from the Goizueta School of Business, who did a formal assessment of the fair. The primary outcome of this assessment was to recommend more effective publicity to draw in an even larger group of students to the fair.*** Though Emory College students and many faculty and staff know about the fair and attend, some other groups, such as graduate students and Business School students were less aware.

### **Practical Guidelines for Catered Events**

Building on the successful experience last year in which we developed a series of “Information Sheets” on sustainable, local food (now posted at [www.sustainability.emory.edu/page/1008/sustainable-food](http://www.sustainability.emory.edu/page/1008/sustainable-food) for public access), the Sustainable Food Committee appointed a subcommittee to develop catering guidelines. We found that the range of events during which catered foods would be purchased made a very diverse series of menus and budget; it was not easy to find wording appropriate to all groups and purposes. The subcommittee’s report was debated actively in three meetings of the whole Sustainable Food Committee, benefiting from the advice of a physician, several nutritionists and public health researchers. The resulting attractive brochure was designed (with a donation to the project) by Emory Dining and it encourages fruits, vegetables, and seasonal and local products instead of more commonly ordered processed foods and sweet items. In preliminary distribution to staff members, the brochure received high praise, and we will continue to disseminate the brochure during the coming academic year in a series of events for faculty, staff, and students. These menu suggestions will help make Georgia’s seasonal fruits and vegetables an anticipated treat for special events, which in turn will build demand, benefit local farmers, and encourage

cultural change toward a healthier diet. The document is now available on the Emory Office of Sustainability Initiatives website: [www.sustainability.emory.edu](http://www.sustainability.emory.edu).

## **Beneficiaries**

### **Educational Garden Project**

In all, we estimate 50 garden workers were beneficiaries of the project, meeting our goal. We also met our goal of garden observers—traffic around the gardens and strollers, especially on weekends, continued to show that they offer a strong educational service for Georgia horticultural crops. We estimate 5000 observers over the course of the year looked at and admired the gardens. This number is probably conservative; they are often pointed out by Emory tour guides to the legions of prospective students and parents who visit the campus.

The gardens also served to support healthy agricultural work experience for disabled and elderly persons. Several of the gardens worked well with the Wesley Woods Horticultural Therapy Program, which allowed recovering hospital patients to plant seeds in their greenhouse. The resulting plants gave the gardens a boost in productivity and provided meaningful work for recovering patients.

### **Farmers Market and Special Events**

As attendance was up sharply from last year, beneficiaries included everyone, estimated to be close to 2,400, who attended the weekly farmers market, and all of the special events. The vendors had a good sales volume, which also would make them inclined to participate more often. ***Attendees benefited greatly, as they visited each booth and discussed with the vendor the healthy attributes of each product. The messages from the vendors varied according to their products; because of this, it was difficult for us to determine 3-4 specific key messages attendees learned.***

### **Sustainable Food Fair**

Our goal to attract over 2000 attendees was borne out by staff estimates. The students' assessment of the fair suggested that commitments to buy fresh, local foods was one of the main outcomes of the fair. Vendors from our regular farmers market reported that the Fair day was an especially good market day of sales for them. ***Please see Appendix 3 for participant survey results.***

### **Practical Guidelines for Catered Events**

The brochures have been disseminated to over 50 staff sustainability leaders, covering most buildings at the Emory campus and Emory Healthcare. We will continue to make efforts to

reach the several hundred office managers across the university, to encourage shifts in campus catering. We have seen changes as well, during the last year, in the official menus offered by Emory Dining's catering menu and they also support the purchase of local and seasonal Georgia crops. Finally, we seek to influence student events with this philosophy, but we have not yet found a way to track any changes with that group. The Emory sustainability website receives over 11,000 hits a day; unfortunately we cannot track hits to the specific page, so we cannot say how many people have seen the Catering Guidelines. The huge increase in traffic to the site, however, bodes well for the numbers of people who gain support for changing catering decisions. Plans continue in the 2011-12 academic year to disseminate the Guidelines broadly in the Emory community.

## Lessons Learned

### **Educational Garden Project**

We continued to see that regular inspection of gardens is important and a new system of log books was established by Judith to help teams report on their activities and any problems. Also, the email communication with teams was improved with a new assistant to Judith. The teams now all have a staff member, which has kept summer maintenance strong. We learned that summer plant growth can outstrip spring enthusiasm—one garden expanded its space only to discover it could not keep up with weeding. We continued to seek a balance between leaving teams to learn from their own mistakes and guiding them to a common standard of attractiveness and productivity.

### **Farmers Market and Special Events**

We learned that our new calendar was a great success and personal encouragement to attendees by the manager, plus publicity materials such as banners, flyers, and emails, were the most effective ways to generate support for the market. The special events continued to draw in new folks, an important way to raise enthusiasm for particular seasonal Georgia crops.

### **Sustainable Food Fair**

We confirmed our shift from the previous year that holding the Fair a little later in the Fall allows better preparation and planning, resulting in a more complex and useful series of educational activities. **We also learned that costume-wearing students were among the most effective ambassadors for new information to fair participants.** We will expand publicity efforts to graduate students and business school students this year, in order to promote the fair among those less-involved groups.

### **Practical Guidelines for Catered Events**

The wording for general guidance in the use of specialty crops for consumers was challenging and time-consuming; however, we felt the effort was well worthwhile.

### **Tracking of Grant Funds and Use for Specialty Crops**

Educational Garden Project: The grant funds for this component of the project were used for seeds, planting materials, supplies, mulch, small laminated signs that identified plants in each garden, planning dinner for combined teams, and Judith Robertson's part-time salary. Emory paid for roughly one quarter of Ms. Robertson's salary.

Farmers Market and Special Events: The grant funds were used to pay for publicity materials for the special events and expenses such as copying recipe cards. Although there were cheese, egg, bread, and other vendors at the market who did not specialize in vegetable crops, the publicity benefits the whole market, and farm vendors were the central core of interest in the market. Funds from the grant were used to support only the general market publicity and for the events related to Georgia specialty crops; Emory pays Julie Shaffer's salary and covers other market-related costs.

Sustainable Food Fair: The grant paid for fair signs, posters, table rental, t-shirts for volunteers, and other publicity materials for the fair; no expenses were incurred from the School of Business assessment. The Fair does include some booths that have non-specialty crop products (such as eggs and pastry), and overall, we estimate those fair activities to be less than 10% of the total. The expenses for the Fair charged to the grant were used to promote the fair as a whole, and the in-kind donations of salary and materials by Emory more than covered the portion of the fair related to these products.

Practical Guidelines for Catered Events: The expenses for this component of our grant were to support the committee through dinner meetings and the design and printing of the brochure. Dinner costs were covered by the Office of Sustainability Initiatives; brochure design was donated by Emory Dining. Staff and faculty time was also donated by Emory. The catering guidelines combined recommendations for vegetables and fruits—which benefit Georgia crops—with recommendations for healthier choices, such as whole wheat products. The significant Emory contribution to this part of the grant offsets the parts of the brochure that were not focused specifically on specialty crops.

For all parts of the grant, careful records of each expenditure was kept by the Office of Sustainability Initiatives (and other offices, where appropriate). Records of matching or in-kind expenses were kept for purchases and direct expenses (such as copying) related to the project. These four components of our project involved many different units of the university, donations of time and materials, and considerable coordination. The salaries of Professor Peggy Barlett and Ms. Julie Shaffer, market manager, were paid for by Emory and were a

contribution to this effort. In addition, depending on the university unit responsible, some parts of the expenses for each component were not charged to the grant, but paid for by Emory. We did not attempt to keep track of every bale of mulch donated by Facilities Management to the gardens or every condiment purchased for a food event at the Farmers Market, nor the personnel expenses (such as Emory Dining design time in creating the Catering Guidelines brochure). Nor has the considerable work of faculty and student experts in writing the brochure or the students who put on the Fair been included in our in-kind calculations. For this reason, we do not have a total for all of Emory’s in-kind donations.

**Appendix 1: List of Educational Food Garden Events**

Below are listed the 7 events for 2010-11 with the number of persons volunteering to work in the gardens or signing up to be on garden worker emails.

**2010**

24 Aug	Green Fair – Few Hall	n = 12
25 Aug	Student Activity Fair – McDonough Field	n = 49
26 Aug	Fall Garden Kick-off Dinner – Cox Hall	n = 20
22 Sep	REHAC Garden Activity - Rollins	n = 10
01 Oct	Sustainable Food Fair – Cox Bridge	n = 11

**2011**

10 Feb	Spring Kick-off Dinner	n = 14
13 May	Staff Fest – Quad	n = 10
	<b>Total</b>	<b>126</b>

**Appendix 2: List of Farmers Market Special Events**

**2010**

10/26 **Pumpkin Carving Contest**

**2011**

1/25 market resumed with kick-off event: **“Eat Your (ugly) Vegetables, Root Veggies 101,”** with Chef Mollie Walsh, Emory Dining Executive Chef for Sustainability demonstrating turnip Soup, turnip gratin, and chocolate beet cake.

4/19, **Earth Week Market Party**, with grilled asparagus.

5/3 , **Berry Bash, featuring Miles Berry Farm** from Baxley, GA. Emory chefs sold strawberry shortcake and the Miles brothers sold flats of strawberries, blueberries, and blueberry bushes.

6/21, **“Old Fashioned Ice Cream Social”** Featuring Georgia peach compote and blueberry compote.

7/19, **“Favorite Flavors of Summer”** featuring an organic corn roast and a watermelon seed spitting contest. Georgia watermelons provided by Emory dining.

8/30, **“Tomato Centric”** repeat of last year’s successful celebration of a summer favorite, with a tomato- centric menu and chef demo.

### **Appendix 3: Food Fair 2010 Evaluation Report by Anthropology 386 students**

Itohan Udogie and Caroline DeMitchell

***According to the vast majority of attendees and vendors, the 2010 Sustainable Food Fair was a huge success.*** Information gathered from the evaluation forms can attest that a good time was had by all. However, not only did the Fair please the palate, but it made learning interactive and interesting. ***All 23 vendors filled out evaluation forms, and despite a small variety of answers on most questions, the responses were overwhelmingly positive.*** The last two pages of this report give more detailed numerical analysis. For the most part, we received fours and fives on all of the ‘rate me’ questions and very nice comments and feedback on the open-ended questions. However, there were several vendors who were not pleased with the ease and organization of arrival and set-up. For instance, TaylOrganic responded “Signs directing where vendors to enter around Emory would have been helpful.” However, part of the dissatisfaction with set-up may have been caused by the unforeseen arrival of a prominent Atlanta figure and his entourage. Another main area of concern by the vendors was that non-food vendors should have been encouraged to bring give-aways as a way to attract students. Perhaps we should make the suggestion when we invite them to the food fair next year. Also, some of the vendors thought the educational value of the issues raised at the Fair were only adequate (equivalent of a two or three). These concerns were a very small minority of the feedback, but nonetheless important to consider. Ease and organization of clean-up got more positive responses than set-up. There was a lot of enthusiasm about interaction with students

and the students' level of interest in sustainability. Most everyone was extremely grateful for the opportunity to attend and expressed thanks. The EPA suggested that we invite more "government and non-profits working with sustainable agriculture." We would have to be very sure that their messages are aligned with our own goals, though.

To address some of the issues raised by vendors, we suggest that on-campus organizations, like Culinary Club and Emory Environmental Alliance, receive more contact prior to the Fair. More signs and maps might make set-up easier, as well as making sure every member of the class knows what to tell vendors the morning of the Fair. Hidden Spring Farms expressed a desire for a clearer shut-down time, so perhaps we can make an announcement with fifteen or twenty minutes left that the Fair will be ending soon so students can make purchases if they want and vendors can start thinking about packing up. Some vendors wanted a larger community to interact with, but we discussed in class that this event was for the Emory community primarily, for logistical reasons. There was a lot of positive feedback about volunteer support and a good number of vendors appreciated our efforts to make set-up as painless as possible. Despite any minor qualms, the vendors all thought of the event as a great success and some are even looking forward to next year already!

***In addition to the vendor praise, the feedback from the attendees was tremendously positive.***

A total of 63 attendee forms were filled out and returned, with a roughly corresponding amount of dots on the dot technology posters. All of forms positively affirmed that the atmosphere contributed to the individual's experience. One of the less favorably mentioned topics of the Fair was quality of advertising. Many of the attendees were graduate/professional students and staff and they did not feel as though they had been adequately reached out to. Whether or not focusing on the greater Emory community as well as on the College could be a good topic for discussion next year. Another popular complaint among the attendees was the long lines at some of the booths.

The most popular aspect of the Fair among the attendees was the free samples from vendors. Many attendees also expressed a desire to have the Fair more than once a year and an increase in the quantity of vendors. When asked what food-related issue most caught their attention, attendees' two top responses were buying local food and grass-fed beef although the issue of justice for tomato and coffee producers also came up. A few people were also affected by the tap versus bottled water lesson provided by Emory Environmental Alliance. ***When asked what lifestyle choices they were considering making due to what they learned from the Fair, the top three responses involved eating more locally, eating grass-fed beef, and not making any changes.***

Some suggestions that attendees made were: using McDonough field as a possible future site of the fair, although we fear that the fair would lose a lot of the traffic that it gains just by being

on Cox Hall Bridge, and sending one final advertisement on the day of the Fair. Some attendees also requested that more lunch foods be available for purchase at the fair. It was empirically noted that many students would enjoy the samples and booths, but then leave within a few minutes to get ‘real’ lunch at Cox or elsewhere.

According to the dot technology, the strongest aspects of the fair were interactions with vendors and the quality and variety of foods and experiences. The samples were amazing and the students definitely appreciated their abundance. However, the dot posters show a somewhat concerning view of publicity and take-away messages. These are very important issues to address, and we suggest that the education team should do more to make clear statements that are noticeable. They should not all sit at the table at once, but rather talk to attendees, walk around with flyers/pamphlets, and draw more people to their booth. The other members of the class can help their cause by telling their friends to visit the education table. Besides that, the take away messages should be more concise and communicable. The interaction with vendors was very positive, both on the dot posters and in the evaluations. Only a few people were not pleased with the vendors’ willingness to talk and interact. Again, please refer to the charts on the last page for a numerical representation of attendee feedback.

In conclusion, the Fair was fantastic: great food, great vendors, and great response from the Emory community. The most important things to consider for next year are clarity of set up instructions for vendors, publicity to non-undergraduate students and the expression of take-away messages about sustainability. Clearly, some of the most common complaints about variety of vendors and long lines are completely out of our control. We do think that it would be wise to encourage all vendors to have give-aways on hand. We are lucky to have been a part of this, and Caroline regrets she will not be here for future Fairs ☺.

Table 1: Vendor Overall Feedback

Question	1: Weak	2	3	4	5: Strong	No answer
Contact with you prior to the fair?	1	1	4	8	8	--
Ease/organization of arrival and set up?	1	1	--	6	14	1
Ease/organization of clean-up and ending?	1	--	3	8	9	4
Attendance and interaction with participants?	--	1	3	8	11	
Issues raised at the fair—educational value?	--	1	4	6	5	2

Table 2: Vendor Feedback: Most Important Take-Away Message

Question	All of the issues	Grass-fed Beef	Honey	Sustainability	Treatment of Tomato Workers	Organic and/or seasonal/local produce	Coffee/fair trade	No answer
What food-	2	17	2	5	2	11	3	17

related issue most caught your attention?								
---	--	--	--	--	--	--	--	--

**Table 1: Attendee Feedback: Best Part of Fair**

Question	No answer	Liked it all	Atmosphere	Free samples	Certain Vendor(s)/Information booths
What was your favorite part of the fair?	11	8	2	29	17

**Table 2: Attendee Feedback: Worst Part of Fair**

Question	Certain vendors	Long lines	No pony	Layout of fair	Nothing	No answer
What was your least favorite part of the fair?	1	5	2	4	13	29

**Table 3: Attendee Feedback: Improvement Suggestions**

Question	Live music	More advertising	Move location	More vendors	More organic food	More information	More fairs	No answer
What can we do to improve future sustainable food fairs?	3	8	1	22	2	1	4	10

**Table 4: Attendee Feedback: Lifestyle Changes**

Question	No answer	No	Yes	Maybe
Are there any lifestyle changes you're considering making due to	9	12	30	5

the Fair?				
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Table 7: Dot Poster Data—Fair attendees’ ratings

Question	1: Weak	2	3	4: Strong
Fair publicity?	9	12	9	34
Educational messages about sustainable food?	0	7	11	30
Interaction with vendors?	1	2	9	35
Quality and variety of experiences?	0	0	10	28

**Contact Person**

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**13. University of Georgia – Using Momi Fir (*Abies firma*) as Root Stock and as a Potential Christmas Tree Species for the Southeast – Final Performance Report**

**Project Summary**

The overall goal of this project was to research the potential of growing a Fraser / Momi fir graft in the southeast. Several attempts have been made to grow firs (*Abies spp.*) in the Southeast. Most attempts have been unsuccessful as either the fir species was physiologically unsuited for the Southeast or plants were killed by the root fungus *Phytophthora*. The Momi was introduced into the US in 1861, but has been rare in the ornamental trade. In the past 15 years, several groups have tried to introduce the Momi fir as the “Dixie” fir or fir of the South. Unfortunately, many of the groups provided misinformation to the growers about the trees’ growing requirements and adaptability.

The Momi fir (*Abies firma*) is a fir that, once established, is very tolerant of heat, drought and the devastating *Phytophthora* root fungus. All these characteristics combine to make Momi fir an

excellent conifer for the Southeast. Recent studies at North Carolina State University have proven the Momi fir could be used as a replacement for the Phytophthora-susceptible Fraser fir (*Abies fraseri*). More importantly, it is also possible to use the Momi fir as root stock to graft other Phytophthora susceptible firs. By doing this, one could vastly increase the growing range that other firs could survive, as one of the biggest limiting factors with firs is the Phytophthora root disease. This would provide several other Christmas tree and ornamental species that could be grown in Georgia and the Southeast.

This grant allowed for a short-term project researching the utilization of Momi firs that have Phytophthora resistance as a root stock for other firs. The project investigator, Dr. Mark Czarnota, University of Georgia, coordinated the grafting of over 1,000 Fraser / Momi grafts, and the planting of 400 on these successful grafts. He also planted over 200 selected Momi firs for future grafting and seed stock. This was an ongoing 2-year project including cooperation with two Georgia Christmas tree growers, and Dr. Frampton at North Carolina State University. The objective was to produce a reliable system for grafting Fraser and Momi fir, as well as select and plant superior Momi firs for a pollen / seed source here in the Southeast. All of these steps would hopefully allow Georgia growers to produce a reliable Georgia Grown Fraser fir.

We were successful with the graft survivability; with the ability to grow the Momi throughout the state, the Fir graft system should be successful in Georgia.

### **Project Approach**

The main objective of the project was to provide an easy / reliable grafting system for grafting Fraser firs (Scion wood) to Momi fir (Root stock).

When the grant funding was made available, supplies were ordered (pots, soil, plants, etc.). In early winter of 2011, over 800 Fraser / Momi grafts were made (please see Figure 1). Over 80% of the grafts took (of the 800 grafts made, 157 grafts did not take; a 19.6 percent graft loss). Grafts were made at two separate locations (Griffin and Tarrytown, Georgia). A shade structure was ordered and erected in Tarrytown in order to protect the recently grafted plants at this location.

The beginning of 2012 included 300 more Fraser / Momi grafts (please see Figure 1). Graft take was poor, less than 50 percent (of the 300 grafts made, 147 grafts did not take; a 49 percent graft loss. We like the numbers to be greater than 80 percent. In early spring of 2012, 120 selected Momi firs were planted for future grafting and seed stock. One hundred Fraser / Momi firs were also planted, and harvestability characteristics will be evaluated over the next several years (evaluation consists of height, width, color, and quality).

Currently we are in the process of planting out all of the Fraser / Momi grafts. This work should be completed by early March 2013. The planting will be followed by the placement of irrigation and the application of herbicides to prevent weeds. Plants will be evaluated this summer and fall for scion growth and overall plant quality.

We will continue grafting other firs to Momi fir root stock. Selected Momi fir and grafted trees will continue to be planted for evaluation, scion / seed stock at both the Griffin and Terrytown locations.

The information we had available about the project was presented at the September 2011 Georgia Christmas Tree Association meeting. Unfortunately, total completion of this project will take additional funding and years of time. Therefore, reporting of the final data to growers and at meetings, as well as inclusion within publications will not take place during the time of this grant.

### **Goals and Outcomes Achieved**

With a 5 to 8 year-window of being harvestable, it is impossible at this time to determine whether the grafted tree will be successful in Georgia on a large scale. *However, we were successful developing an easy reliable grafting system for grafting Fraser firs (Scion wood) to Momi fir (Root stock).* With the ability to grow the Momi throughout the state already known, there is a very good possibility that this fir graft system will be successful here in Georgia and allow for the production of Fraser firs.

## **Beneficiaries**

This project will ultimately impact more than 100 Christmas tree growers throughout Georgia, the landscape industry and consumers. Moreover, the entire Southeast could benefit from this fir graft system. Growers who take the initiative can graft, plant, and sell the Fraser fir.

## **Lessons Learned**

Any project that involves trees takes a long time to determine whether it was successful. Also, to really move a research project forward, one person needs to focus on just that project; the best way to do that in academia is with a graduate student. Unfortunately, funds were inadequate to hire a student for this project, but it is hopeful that in the future this can be accomplished.

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## **Additional Information**

News releases on project:

<http://chronicle.augusta.com/news/metro/2012-12-17/uga-hopes-produce-georgia-christmas-tree>

[http://www.caes.uga.edu/applications/gafaces/?public=viewStory&pk\\_id=4603](http://www.caes.uga.edu/applications/gafaces/?public=viewStory&pk_id=4603)

<http://growinggeorgia.com/news/2010/12/georgia-grown-fraser-fir-christmas-trees-on-the-horizon/>

<http://growinggeorgia.com/news/2010/12/georgia-grown-fraser-fir-christmas-trees-on-the-horizon/>



**Figure 1. Split grafting process: A=Cutting scion wood, B= Matching cambium layers, C= Applying grafting tape, D= Applying grafting paint, E= Finished graft, F= Successful graft one year later**

## **14. University of Georgia – Control of Foodborne Pathogens on Fresh Produce – Final Performance Report**

### **Project Summary**

Several outbreaks of salmonellosis associated tomato consumption occurred in the USA in recent years, with 1,616 reported illnesses in nine outbreaks during 1990—2004. The primary goal of this project was to evaluate a new food-grade formulation, including levulinic acid plus sodium dodecyl sulfate (SDS) at lower concentrations as an effective, practical, cost-efficient and environmental-friendly wash/rinse/dip treatment to substantially reduce *E. coli* O157:H7, *Listeria monocytogenes*, and *Salmonella* contamination on tomatoes.

Whole tomatoes were inoculated with ca.  $10^5$  CFU *E. coli* O157:H7, *Salmonella* Typhimurium, and *Listeria monocytogenes*/tomato and dried in a laminar hood for 20 minutes; the tomatoes (10 per group) were submerged in 10 L of 5 ppm acidified chlorine (pH 4.0), tap water, or 0.5% levulinic acid plus 0.05% SDS (pH 3.2) for 1, 5, or 10 min at 8°C. Mean *E. coli* O157:H7 counts on tomatoes treated for 5 min with tap-water, 5 ppm chlorine, or 0.5% levulinic acid plus 0.05% SDS were 1.3, 1.1, and <0.7 log CFU/tomato, respectively. *E. coli* O157:H7 was detected by enrichment culture in the tap water and 5 ppm chlorine treatment solutions but not in the 0.5% levulinic acid plus 0.05% SDS treated solution. Mean *S. Typhimurium* counts on tomatoes treated for 5 min with tap water, 5 ppm chlorine, or 0.5% levulinic acid plus 0.05% SDS were 3.6, 4.1, and 1.4 log CFU/tomato, respectively. Mean *L. monocytogene* counts on tomatoes receiving the same treatments were 3.1, 2.7, and 2.4 log CFU/tomato, respectively. Results obtained from dump tank treatment indicated that total average aerobic bacteria counts on the surface of tomatoes were 4.94 and 2.87 log CFU/tomato before and after treatment, respectively; with an average reduction of 2.07 log CFU/tomato. Total average coliform on the surface of tomatoes before and after treatment was 3.68 and 2.07 log CFU/tomato, respectively; with an average reduction of 1.61 log CFU/tomato.

### **Project Approach**

In laboratory, whole tomatoes were inoculated with ca.  $10^5$  CFU *E. coli* O157:H7, *Salmonella* Typhimurium, and *Listeria monocytogenes*/tomato and dried in a laminar hood for 20 min; the tomatoes (10 per group) were submerged in 10 L of 5 ppm acidified chlorine (pH 4.0), tap water, or 0.5% levulinic acid plus 0.05% SDS (pH 3.2) for 1, 5, or 10 min at 8°C. Mean *E. coli* O157:H7 counts on tomatoes treated for 5 min with tap-water, 5 ppm chlorine, or 0.5% levulinic acid plus 0.05% SDS were 1.3, 1.1, and <0.7 log CFU/tomato, respectively. *E. coli* O157:H7 was detected by enrichment culture in the tap water and 5 ppm chlorine treatment solutions but not in the 0.5% levulinic acid plus 0.05% SDS treated solution. Mean *S. Typhimurium* counts on tomatoes treated for 5 min with tap water, 5 ppm chlorine, or 0.5% levulinic acid plus 0.05% SDS were 3.6, 4.1, and 1.4 log CFU/tomato, respectively. Mean *L.*

*monocytogene* counts on tomatoes receiving the same treatments were 3.1, 2.7, and 2.4 log CFU/tomato, respectively. Results obtained from lab studies revealed that the levulinic acid and SDS treatment was effective in reducing foodborne pathogen contamination on tomatoes.

In a food processing facility, a dump tank is a commercial washing facility located on a farm. The total volume in the dump tank is about 3,397 liters (897 gallons). Water is freshly filled from ground water at  $60 \pm 2^\circ\text{F}$  ( $15.6^\circ\text{C}$ ). The chemicals were added in the trough closed to sucking input with water circulation on. The final chemical concentration is 0.5% levulinic acid plus 0.05% sodium dodecyl sulfate (SDS). The determination of pH was evaluated at 4 different corner locations after water was circulated at least for 5 min.

Tomatoes were freshly collected from the field. A total of 50 boxes of tomatoes (about 11 pounds or 5 Kg per box and 150-300 g per tomato) were used. One tomato from each box was randomly picked up by hand with a sterilized glove and transferred individually into a Whirl-Pak bag (24 oz., size 15 x 23 cm) containing 9-ml of 0.1 M phosphate buffered solution, pH 7.2 (PBS). All 50 boxes of tomatoes were poured into the dump tank for at least 1 min. A total of 50 tomatoes were randomly picked up in the climbing chain area and individually placed into Whirl-Pak bags with 9 ml PBS. All bags were kept in a cooler at  $5^\circ\text{C}$  and transported to the Center for Food Safety, University of Georgia for microbiological analysis within 24 hours.

Each bag was massaged for 1 minute by hand. A volume of 1-ml solution from each bag was serially (1:10) diluted in 9-ml 0.1% peptone up to  $10^{-6}$  CFU/ml. A volume of 0.1 ml from each diluted tube was surface-plated on MacConkey agar (MCA), XLD agar, and plate count agar (PCA) plates in duplicate. MCA and XLD plates were incubated at  $37^\circ\text{C}$  for 14 h and PCA plates were incubated at  $30^\circ\text{C}$  for 72 hours for bacterial counts. Typical red colonies on MCA were presumptive *E. coli* and one from every ten of these colonies were confirmed by biochemical analysis (API 20E). Pre-enrichment was performed by adding 100-ml of universal broth into each bag containing tomato and all liquid and incubated at  $37^\circ\text{C}$  for 24. Then 1 ml of broth was transferred into 10-ml of selenite cystine broth (Becton Dickinson) and incubated for 24 h at  $37^\circ\text{C}$ . After incubation, 10  $\mu\text{l}$  of enrichment broth was spread on the surface of XLD plates with a bacteriological loop, and the plates were incubated for 24 h at  $37^\circ\text{C}$ . Typical *Salmonella* colonies were transferred to fresh XLD plates, which were incubated under similar conditions. All presumptive *Salmonella* isolates were confirmed as the *Salmonella* with the *Salmonella* latex agglutination assay (Oxoid, Basingstoke, UK). Isolates positive for *Salmonella* by latex agglutination assay were further confirmed as *Salmonella* by biochemical method (API 20E, bioMérieux, Hazelwood, MO).

Total aerobic bacteria count on the surface of tomatoes (50) indicated that the average count was 4.94 and 2.87 log CFU/tomato before and after treatment, respectively. Average reduction was 2.07 log CFU/tomato. Total coliform on the surface of tomatoes (50) before and after treatment was 3.68 and 2.07 log CFU/tomato, respectively. Average reduction was 1.61 log CFU/tomato. Among them 15 tomatoes were not detected by direct plating method.

For quality evaluation of tomatoes following bactericide treatment, tomatoes purchased from a local retail stores were used for determination. Tomatoes ( $250 \pm 15$  g) were individually

dipped in a stainless bowl containing 4 L diluted bactericide solution at 21°C for 15-20 seconds and air-dried at room temperature. Tomatoes treated with water only were used as the negative control. Stainless bowl containing tomatoes were kept at 5°C for 5 days and then at 15°C for 20 days. Results revealed that average coliform in bactericide-treated and water-treated tomatoes at day 14 were 4.1 and 5.0 log CFU/tomato, respectively; with an average reduction of 0.9 log CFU/tomato. This characteristic against the growth of coliform and aerobic bacteria in bactericide-treated tomatoes lasted for 20 days (Table 1). Thus the shelf-life of bactericide-treated tomatoes will be extended because of reduced microbial load.

Table 1: Bacterial counts of tomatoes after dip/coat treatment for 15 sec at 21°C in bactericide solution, dried at 21°C and held at 5°C for 5 days, then at 15°C for 20 days.

Day	Temperature (°C)	Bactericide-treated (1:88 dilution)		Tap water-treated only	
		Coliforms (log CFU/tomato)	ABC (log CFU/tomato)	Coliforms (log CFU/tomato)	ABC (log CFU/tomato)
0	5	3.4	4.4	5.9	6.0
1	5	3.4	4.6	3.8	5.5
5	5	2.1	3.2	4.6	5.2
8	5 for 5 days plus 15 for 3 days	4.4	4.4	5.9	6.7
14	5 for 5 days plus 15 for 9 days	4.1	5.0	5.0	6.2
20	5 for 5 days plus 15 for 15 days	4.5	5.5	4.8	6.0

### Goals and Outcomes Achieved

Current data demonstrated that this treatment solution containing 0.5% levulinic acid plus 0.05% SDS was efficient for inactivation of foodborne pathogens on tomatoes. Future tests will focus on practical application. Our partners, including farmers, hope to simplify this processing and use it directly in tomato fields. We plan to test it on tomato fields by two methods: 1) using a dump tank that holds 20-30 gallons of treatment solution by dip method (20-30 seconds); and 2) spray it on tomato trees before collection of tomatoes.

### Beneficiaries

Charles Hall, Director of Georgia Fruit and Vegetable Growers Association, is closely working with us. He helps us to identify the farms that can provide the facilities, personnel, and tomatoes for our studies. We shared our study data with him once the studies in each phase were

completed. Mr. Hall gives us the suggestions, and shares these results with farmers and gets the feedback before our next studies. The tomato farmers in Georgia will get the first benefit.

### **Lessons Learned**

All treatment procedures have to be effective and practical for the farmers to adapt it.

### **Contact Person**

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### **Additional Information**

Part of the results entitled, “Inactivation of Foodborne Pathogens on Tomatoes by Levulinic Acid plus Sodium Dodecyl Sulfate” (poster presentation) was presented at the 12<sup>th</sup> ASEAN Food Conference 2011-food innovation: key to create economy, June 16-18, 2011, Bangkok, Thailand. There were more than 1,500 in attendance at the conference. “Control of Foodborne Pathogens on Tomatoes” (oral presentation) was presented at the National Restaurant Association Quality Assurance Group Meeting, October 3-5, 2011, Atlanta, Georgia. There were more than 120 in attendance at this meeting.

All data was presented at the Southeast Regional Fruit and Vegetable Conference, held in Savannah, Georgia, on January 10-13, 2013. There were more than 2,500 attendees.

## **15. University of Georgia – Pecan Aphid Mite Control – Final Performance Report**

### **Project Summary**

*Field trials determined the efficacy of new chemical and biological control methods for aphid and mite pests of pecan trees to replace old chemical controls that can no longer be applied to pecans. Trials were set out on experiment station research plots over three seasons and the results found three highly effective alternatives for aphid control and an integrated biological-chemical strategy for pecan leaf scorch mite control. One chemical control was highly effective against both aphids and mites. The grant funding was used to supply additional labor and orchard maintenance supplies to increase the numbers of treatments and replications leading to*

*a robust data set. The results indicate that growers will have highly effective aphid and mite control methods for at least the next 7 seasons.*

## **Project Approach**

The object of the research was to investigate biological and chemical control methods for aphids and mites in commercial pecan orchards to replace three chemical control methods – Temik (aldicarb), Admire (imidocloprid) and Kelthane (dicofol) - that can no longer be used effectively by Georgia producers. [*Pecan was taken off the Temik label. Aphids became resistant to Admire. The manufacturer withdrew Kelthane from the market.*] During the research portion of the project from Aug. 1, 2010 to Dec. 31, 2012, field experiments were conducted in three areas: 1) Biological and chemical controls of pecan aphids; 2) Biological and chemical control of pecan leaf scorch mite; and, 3) Integration of chemical control of hickory shuckworm with biological control of pecan leaf scorch mite.

During the reporting portion of the project, the results of the research were presented to learned groups at the following meetings: Georgia Fruit and Vegetable Growers' Meeting in Savannah, GA, with several hundred attendees, and 90-100 pecan growers attending the education meeting; the Georgia Pecan Growers' Convention, with 175 attendees; the S-1047 Regional Research Technical Committee in Las Cruces, NM, with 16 attendees; and the Southeastern Pecan Growers Meeting in Destin, FL, with 220 pecan growers in attendance. The information is also available online through [www.angelfire.com/yt/pecanbugs](http://www.angelfire.com/yt/pecanbugs) and [www.jimdutcher.com](http://www.jimdutcher.com) websites. The project started in August 2010 when funding was announced. The project objectives were completed on July 31, 2013.

## **Goals and Outcomes Achieved**

### 1. Biological and chemical controls of pecan aphids.

Foliage feeding insects and mites cause damage to the pecan nut crop indirectly by damaging the cells of the vascular system and removing essential nutrients and water from the plant during the season. This feeding injury leads to reduced nut production if the injury is severe and prolonged over two or more consecutive seasons. Biological control of aphids and mites on pecan foliage is effective with predators. For aphids, the native and introduced ladybeetles and native lacewings are already present in significant abundance in Georgia to prevent significant outbreaks of blackmargined and yellow pecan aphids in 4 out of 6 seasons or 2/3<sup>rd</sup> of the time. These predators also prevent significant outbreaks of black pecan aphid in 2 out of 6 seasons or 1/3<sup>rd</sup> of the time (Dutcher et al 2012). For pecan leaf scorch mites, the native predators are not effective in commercial orchards and more efficient predators have to be imported to elicit biological control. Once these predators are introduced in the orchard, sustained control is possible for several seasons following the release. Predators can be conserved by using selective insecticides and miticides in the orchard that are less harmful to the predator populations.

Aphid control materials were evaluated in 2010 (Figures 14 & 15), 2011 (Figures 16 & 17), and 2012 (Figures 1 through 6) for efficacy against aphids at the 'Desirable' orchard on the Ponder Farm of the UGA – Tifton Campus. Treatment of the aphid-infested trees with

insecticides with an airblast sprayer indicated that sulfoxaflor, pyometrizine, and tolfenpyrad were effective as controls for yellow pecan aphid, blackmargined aphid and black pecan aphid. In all three seasons, 1-2 applications were needed for season-long control. The treatments did not significantly affect pecan yield or kernel quality in any of the field trials (Figures 7 through 9).

## 2. Biological and chemical control of pecan leaf scorch mite.

Biological control of the pecan leaf scorch mite with the release of predatory mites was evaluated in a field trial in 2012 (Figure 10). The western predatory mite effectively controlled pecan leaf scorch mite; whereas, *Phytoseulis persimilis* gave some initial reduction in pecan leaf scorch mite and then failed. Mite control materials were evaluated in 2011 (Figures 18, 19 & 20) and 2012 (Figures 11 & 12) for efficacy against the pecan leaf scorch mite, *Eotetranychus hicoriae* (McGregor) and in 2012 against the southern red mite *Olygonychus ilicis* (Figure 13). During the period from 2009-2012, pecan growers reported a lack of efficacy of miticide treatments for pecan leaf scorch mites including the materials Portal and Nexter. These miticides have similar modes of action and these anecdotal reports may be indications of resistance developing in Georgia populations of the pecan leaf scorch mite. The trials indicated a high level of long-lasting efficacy of a single application of the miticides against a significantly high population of pecan leaf scorch mites. One of the new materials, Zeal, has a novel mode of action that differs from Portal and Nexter.

## 3. Integration of chemical control of hickory shuckworm with biological control of pecan leaf scorch mite.

In pecan management, injury by insects that feed on the nuts is not tolerated since this type of injury directly reduces the production. Insect and mite injury to the foliage, on the other hand, can be tolerated to a minor degree, since this injury has to be very high to cause a loss of production. Insecticides give the grower a method for nearly complete control of the nut feeding pests. Release of predatory mites for biological control of pecan leaf scorch mite gives the grower a method to control mites and suffer a minor degree of leaf injury. One tenet of integrated pest management of insect and mite pests in high valued fruit and nut crops is to use insecticides for fruit and nut pests and biological controls for foliage pests. During 2012, field research results on the integration of control for hickory shuckworm and pecan leaf scorch mite indicated that Apta and Athena, two new broad spectrum insecticide treatments integrated well with biological control of the pecan leaf scorch mites with predators (Fig.14). The trial indicated that western predatory mite was more effective than *P. persimilis* for biological control of pecan leaf scorch mite. Athena and Apta effectively controlled hickory shuckworm. The combination of which were tested to determine the effectiveness of new insecticides against hickory shuckworm and the impact of the insecticides on an outbreak of pecan leaf scorch mites in plots with and without the application of predatory mites as a biological control.

## **Beneficiaries**

The research benefits southeastern commercial pecan growers who have similar production systems such as Georgia, South Carolina, Florida, Alabama, Mississippi, Louisiana, and eastern Texas, by: 1) finding five highly effective alternatives to the lost standard miticide – Dicofol – in

Acramite, Desperado, Portal, Zeal, and Nexter; and 2) finding a selective mite control - Acramite - to control outbreaks of pecan leaf scorch mite that may occur in orchards after the release of western predatory mites. Pecan growers can use the broad spectrum insecticides Apta and Athena for control of late season nut pests such as hickory shuckworm and maintain biological control of pecan leaf scorch mites.

### **Lessons Learned**

This research supplies pecan growers with more effective chemical and integrated control methods. The combined aphid and mite results indicated that new insecticides had a wide range of effects on pecan aphid populations in the first screening trials of 2010. Effective control of blackmargined aphid was not achieved with neonicotinoid insecticides (Provado, Belay). The resurgence of blackmargined aphids occurred after cyazapyr and Cobalt were applied to the trees indicated that these materials are removing natural controls from the leaves resulting in very high populations of aphids after the treatment. Sulfoxaflor and Fulfill achieved good control of blackmargined aphids. Beleaf and Bexar did not achieve sustained control of blackmargined aphids. Black pecan aphids on the other hand, were effectively controlled with standard Provado and Cobalt treatments.

Growers are seeking a single insecticide that controls blackmargined and black pecan aphid, since the two aphid species occupy the same niche. When one species is controlled and the other is not controlled, the uncontrolled species increases more rapidly when its competition is removed. Sulfoxaflor, Fulfill and Nexter are the better treatments for controlling both species. These results were supported by the 2011 trials where the results were similar to 2010. Nexter was found to be effective for overall control of aphids and mites with a single pesticide. *The efficacy of these sprays is less costly and more effective than Temik or Admire or Kethane for aphid and mite control.*

The research effort has led to new experimentation in 2013. Aphid pest management research continues on schedule with the development of new monitoring systems to measure flight periods of aphids and aphid predators. Biological mite control research in a commercial pecan orchard continues with a 10-acre plot at Muckalee Plantation in Lee County, Georgia, demonstrating the effectiveness of western predatory mite as a biological control under conditions in a commercial orchard (see photographs in **Additional Information Section** below).

**Dutcher, J. D. H. Karar, and G. Abbas. 2012.** Seasonal abundance of aphids and aphidophagous insects in pecan. *Insects* 3:1257-1270. doi: 10.3390/insects3041257.

**Dutcher, J. D., E. Fonsah, and W. G. Hudson. 2009.** Integration of bifenthrin and western predatory mite (Acari: Phytoseiidae) for control of pecan leaf scorch mite (Acari: Tetranychidae) in pecan orchards. *J. Entomol. Sci.* 44: 98-110.

Fig. 1 - Mid-Summer Yellow Pecan Aphid Abundance in Insecticide-Treated and Nontreated Pecan Trees.

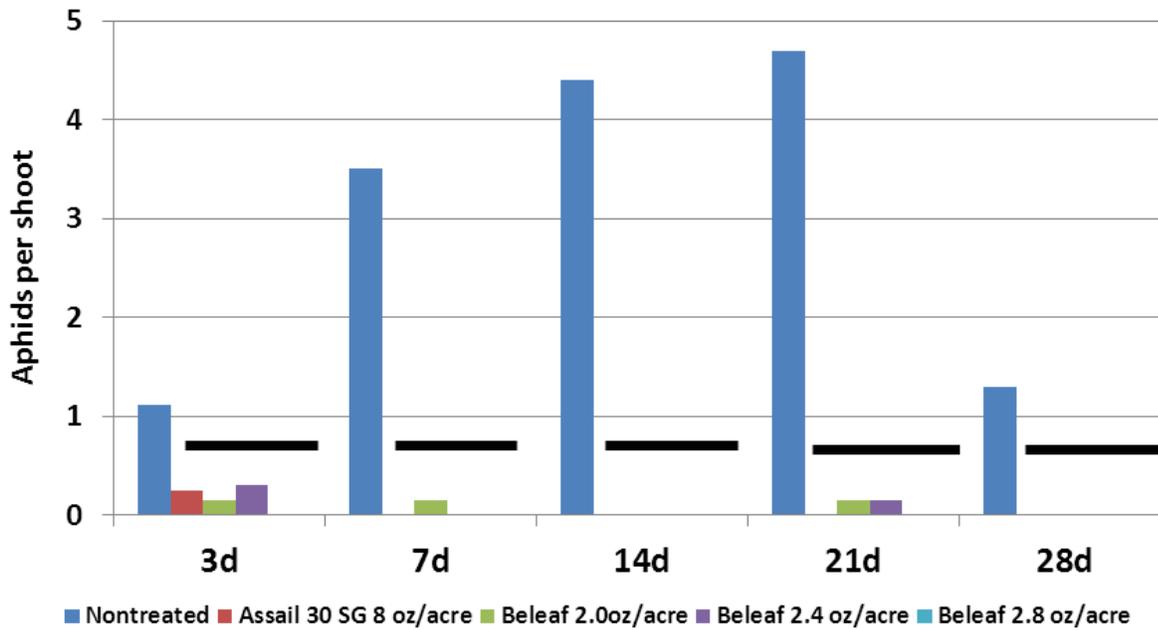


Figure 1. Effectiveness of a midsummer sprays of 4 insecticide treatments against the yellow pecan aphid in 'Desirable' pecan trees. UGA- Tifton, 2012.

Fig. 2 - Mid-Summer Blackmargined Aphid Abundance in Insecticide-Treated and Nontreated Pecan Trees.

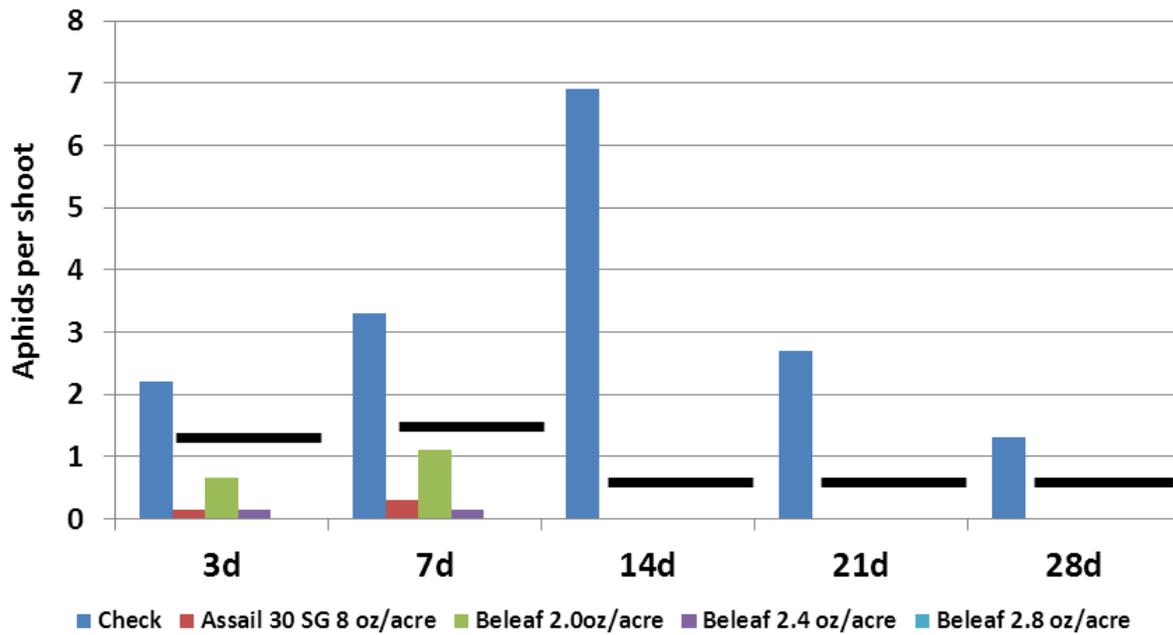


Figure 2. Effectiveness of a midsummer sprays of 4 insecticide treatments against the blackmargined aphid in 'Desirable' pecan trees. UGA- Tifton, 2012.

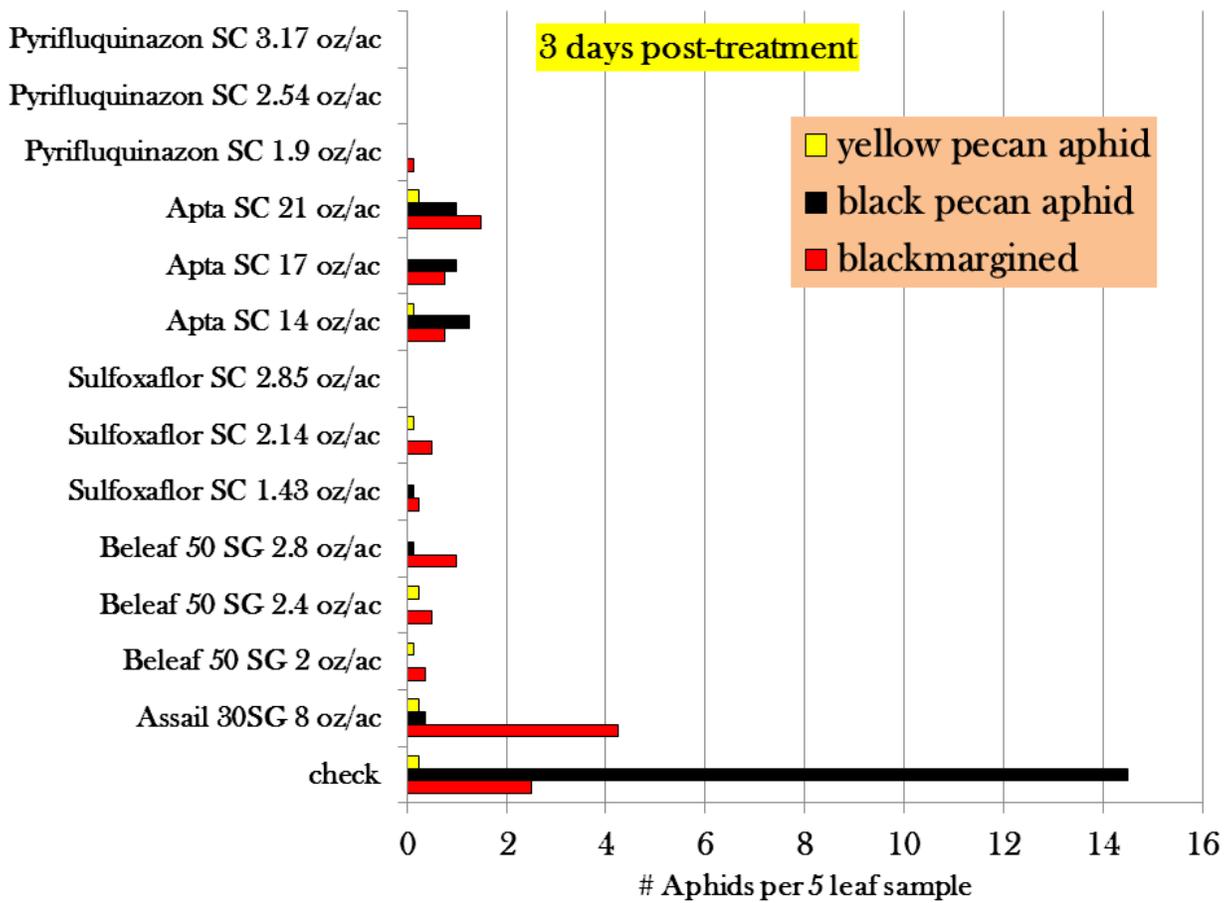


Figure 3. – Effectiveness of aphidicides against three species of foliage feeding aphids on pecan. Aphid abundance 3 days after treatment in insecticide treated pecan trees in a controlled field trial at the Ponder Farm, UGA-Tifton Campus, 2012.

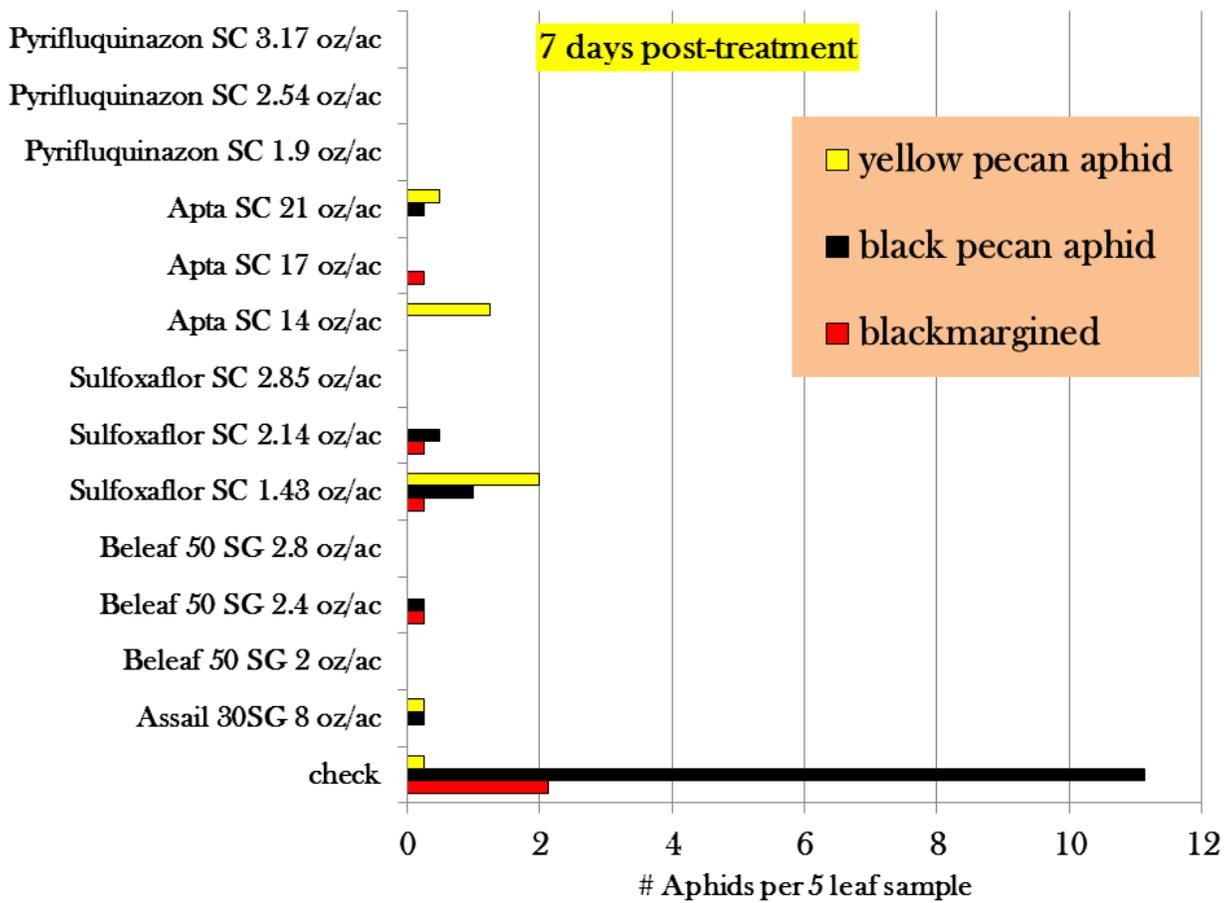


Figure 4 – Residual effectiveness of aphidicides against three species of foliage feeding aphids on pecan. Aphid abundance 7 days after treatment in insecticide treated pecan trees in a controlled field trial at the Ponder Farm, UGA-Tifton Campus, 2012.

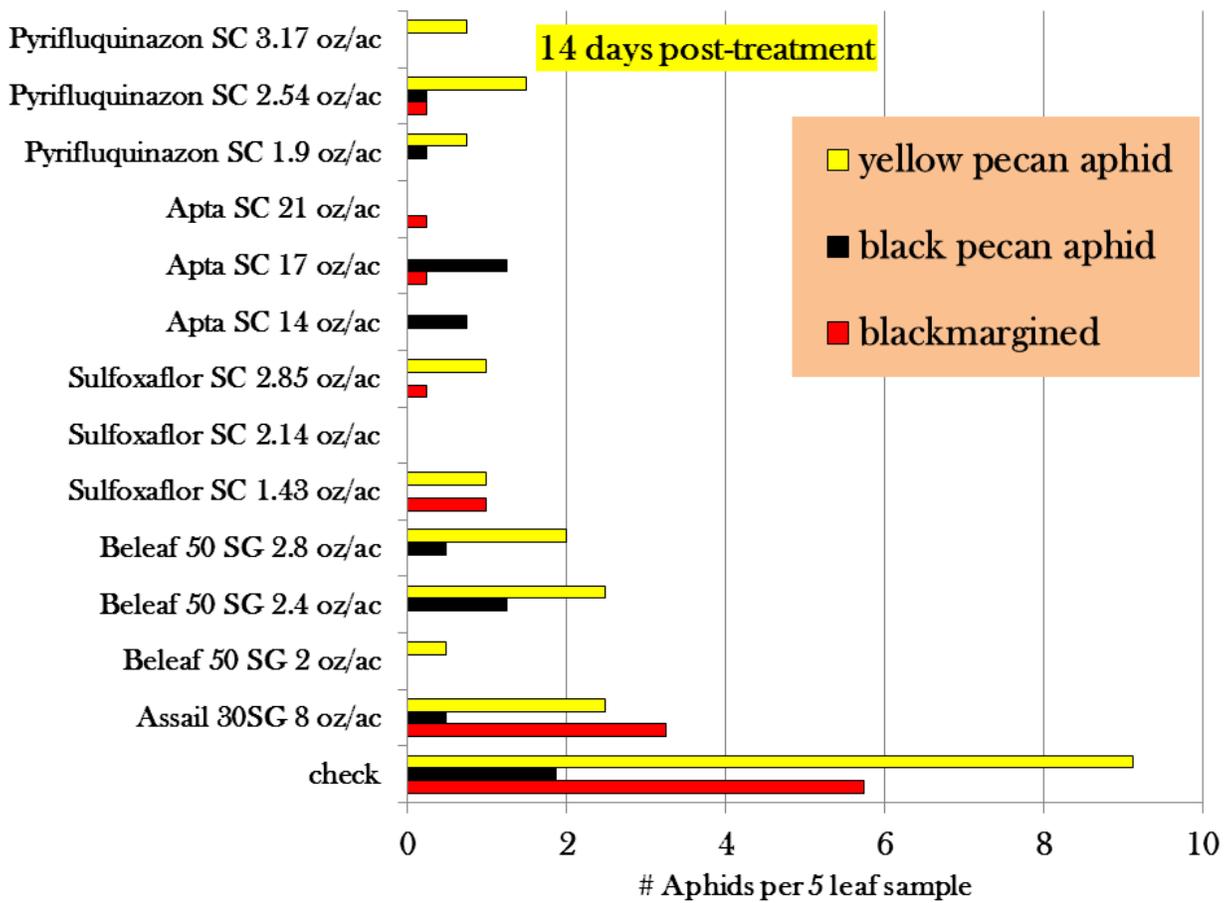


Figure 5. – Residual effectiveness of aphidicides against three species of foliage feeding aphids on pecan. Aphid abundance 14 days after treatment in insecticide treated pecan trees in a controlled field trial at the Ponder Farm, UGA-Tifton Campus, 2012.

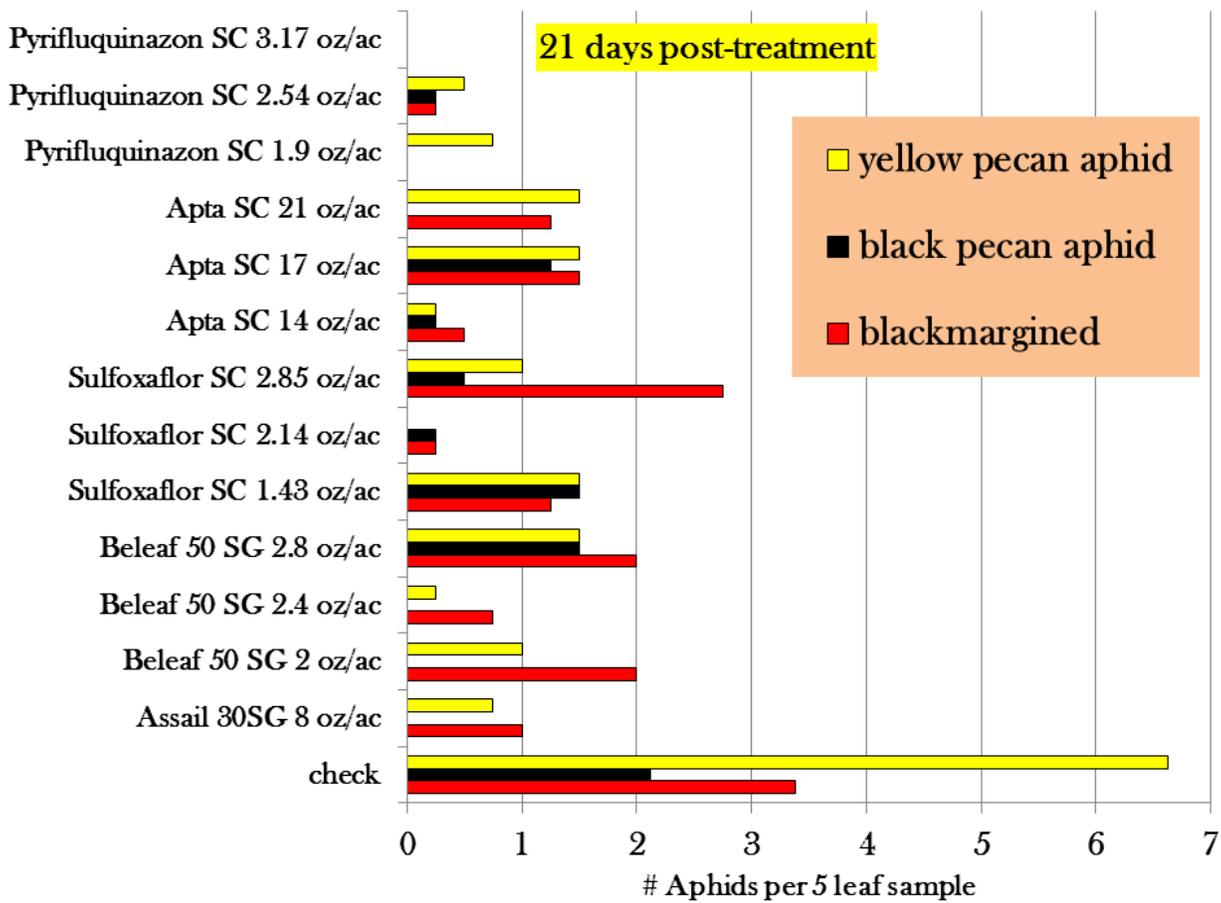


Figure 6. – Residual effectiveness of aphidicides against three species of foliage feeding aphids on pecan. Aphid abundance 21 days after treatment in insecticide treated pecan trees in a controlled field trial at the Ponder Farm, UGA-Tifton Campus, 2012.

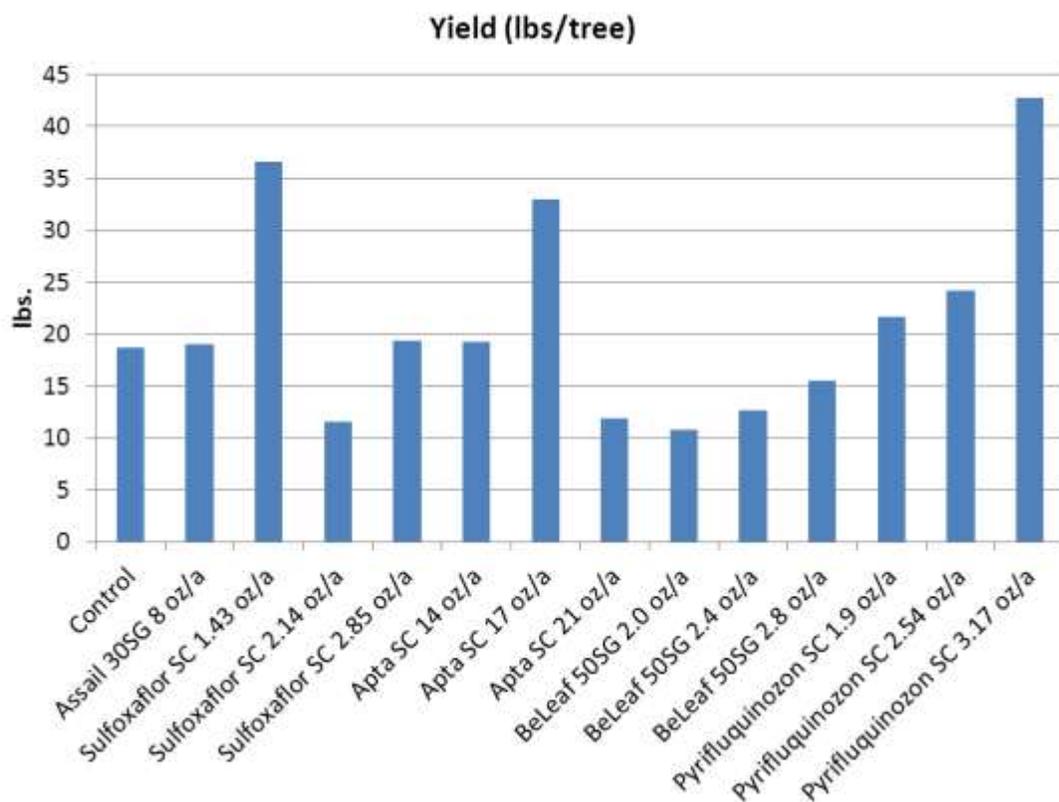


Fig. 7. Yield in the aphid control trials was highly variable between trees and no significant differences were found in pecan yield (lbs in-shell/tree) between the treatments.

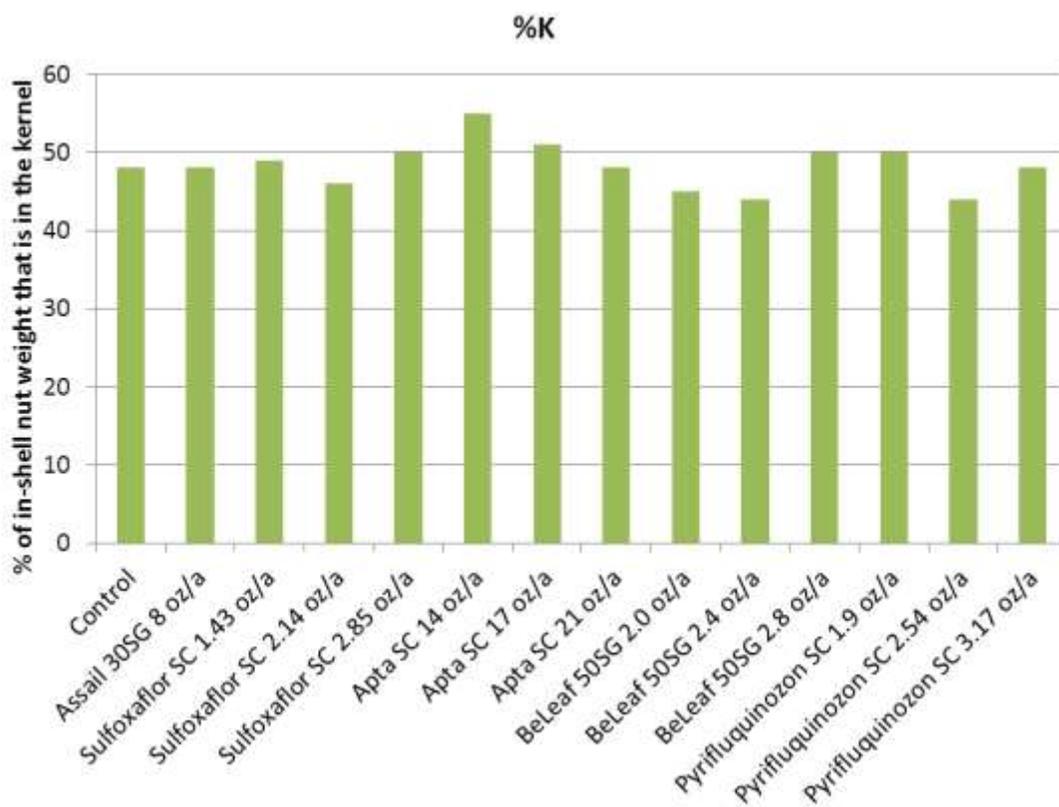


Fig. 8. Kernel quality (percent kernel) in the aphid control trials was fairly uniform and kernels were filled out. No significant differences were found in percent kernel between the treatments. Higher number indicates more kernel filling and better quality pecans.

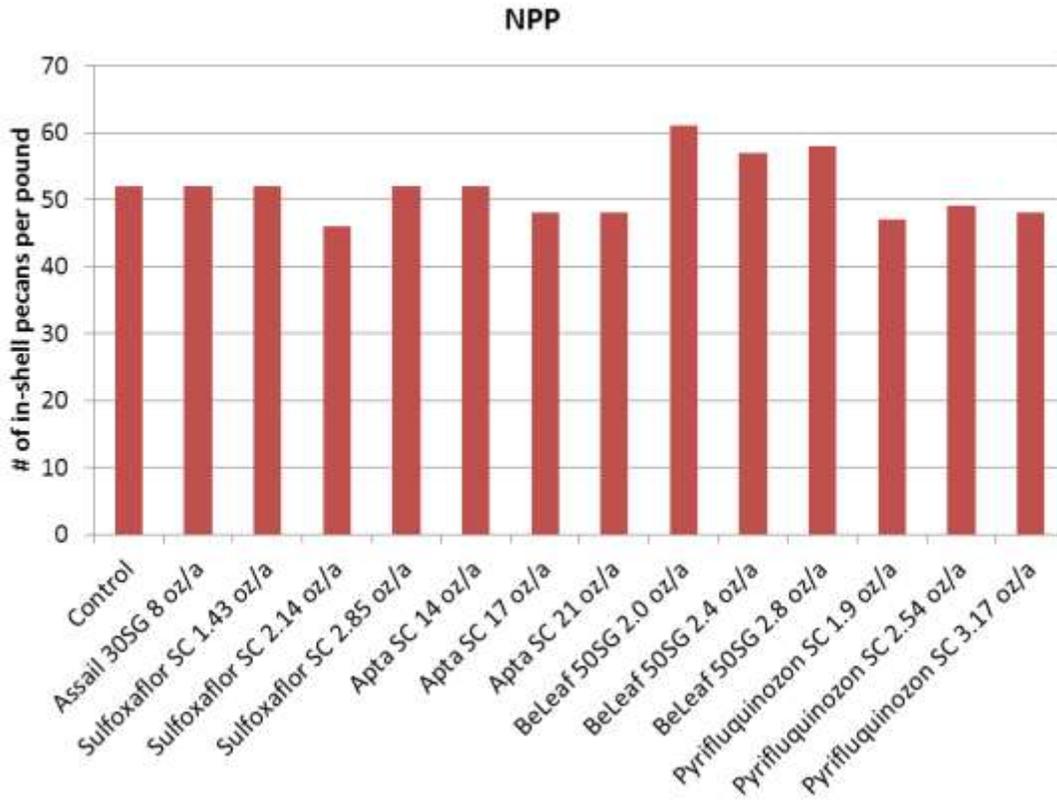


Fig. 9. Nut size (nuts per pound) in the aphid control trials was fairly uniform and nuts were of good quality between trees and no significant differences were found in nut size between the treatments. Lower number indicates larger better quality pecans.

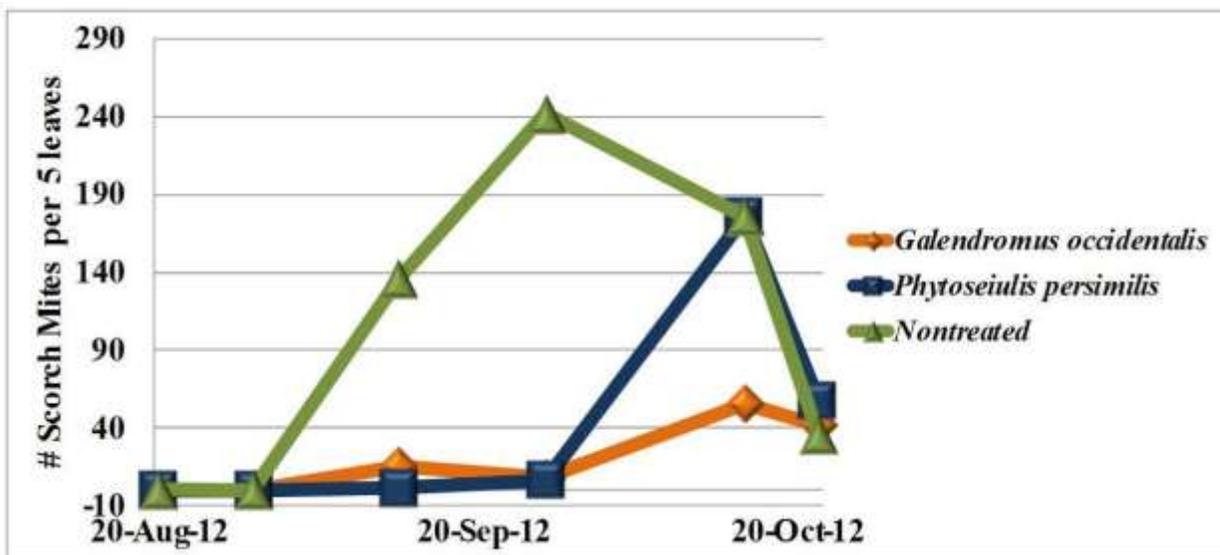


Figure 10. Biological control of pecan leaf scorch mite with release of two species of phytoseiid predatory mites.

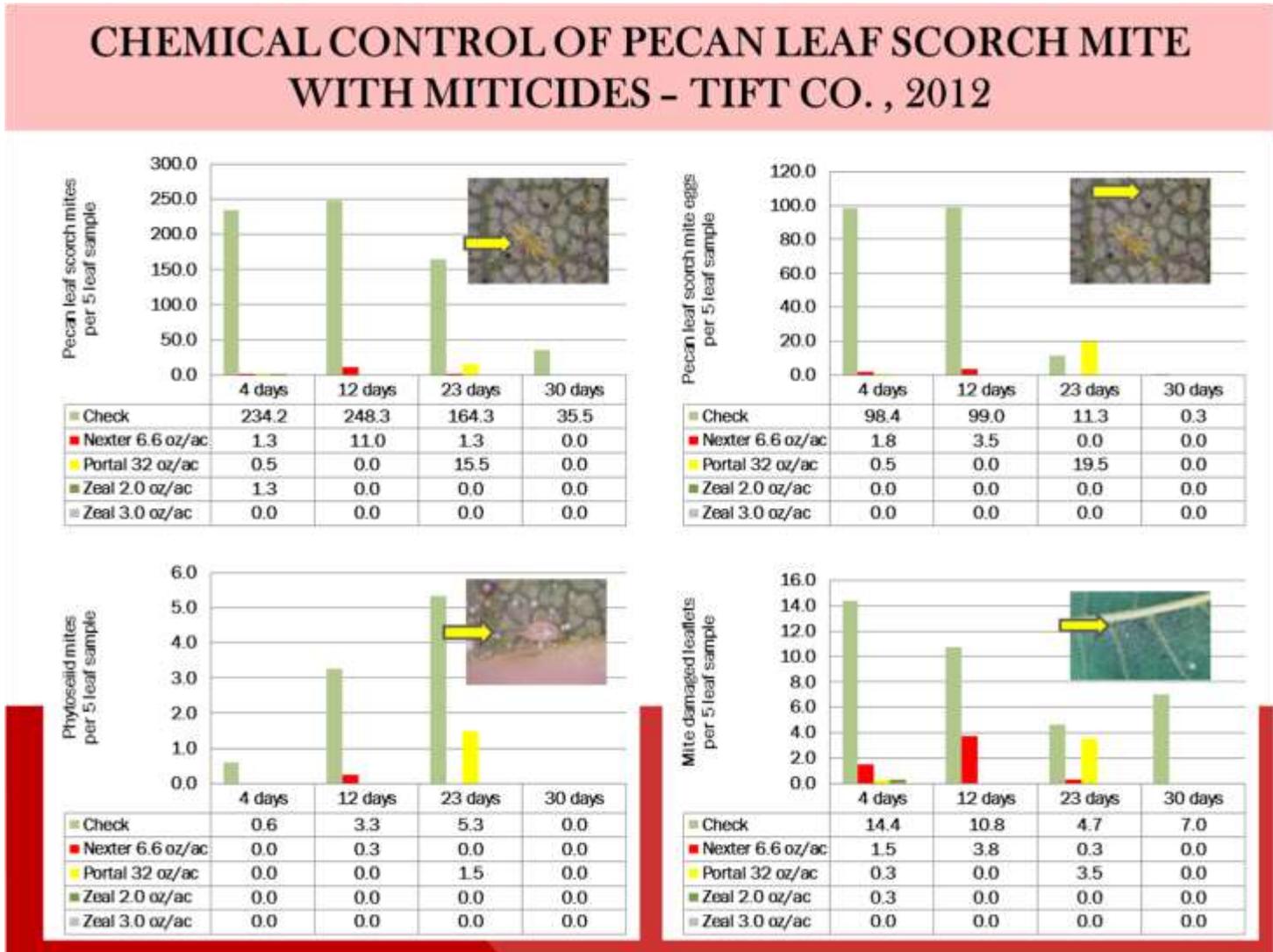


Fig. 11. Efficacy of new miticide alternatives to replace dicofol for pecan leaf scorch mite control in commercial pecans.

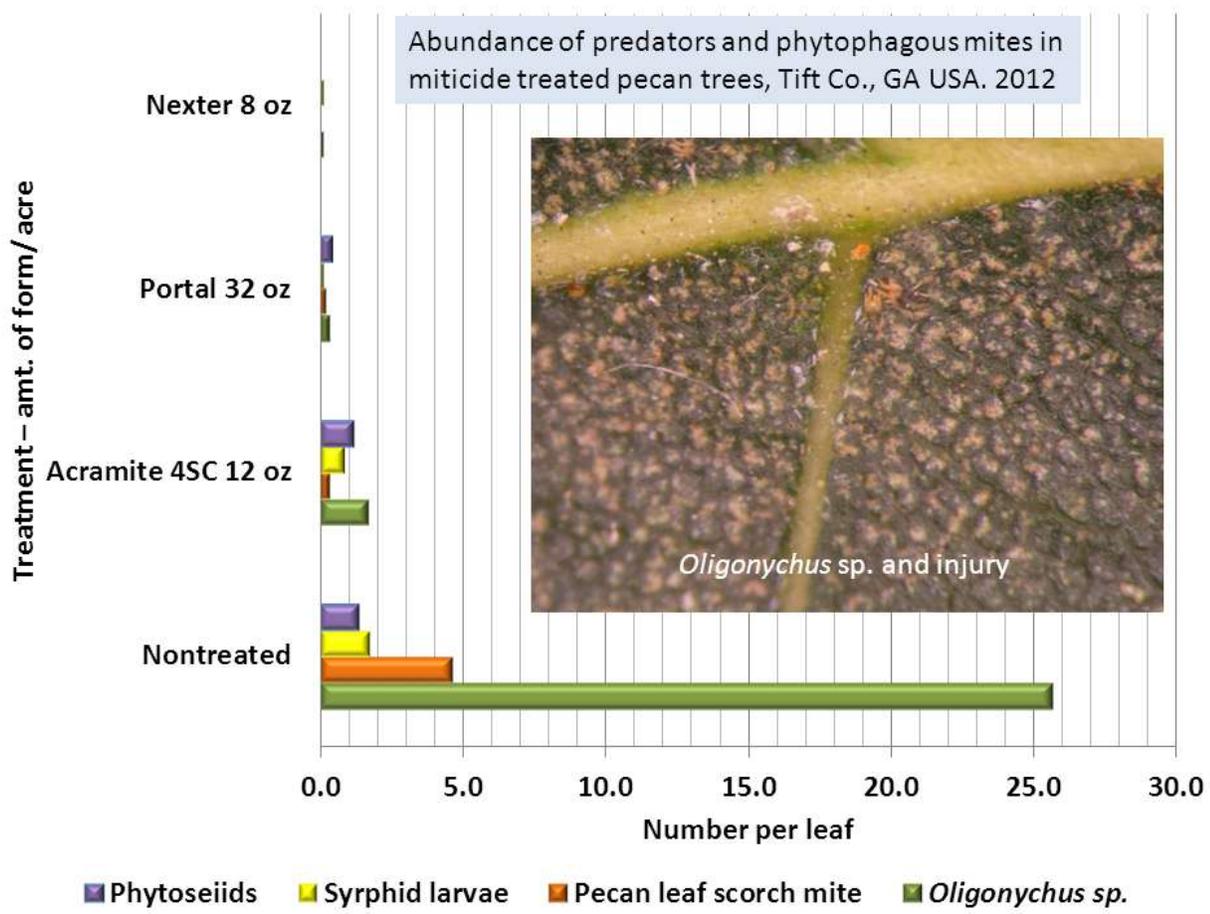


Fig. 12. Chemical control of *Oligonychus sp.* in a heavily infested commercial orchard near Lowndesboro, AL. USA, 2012

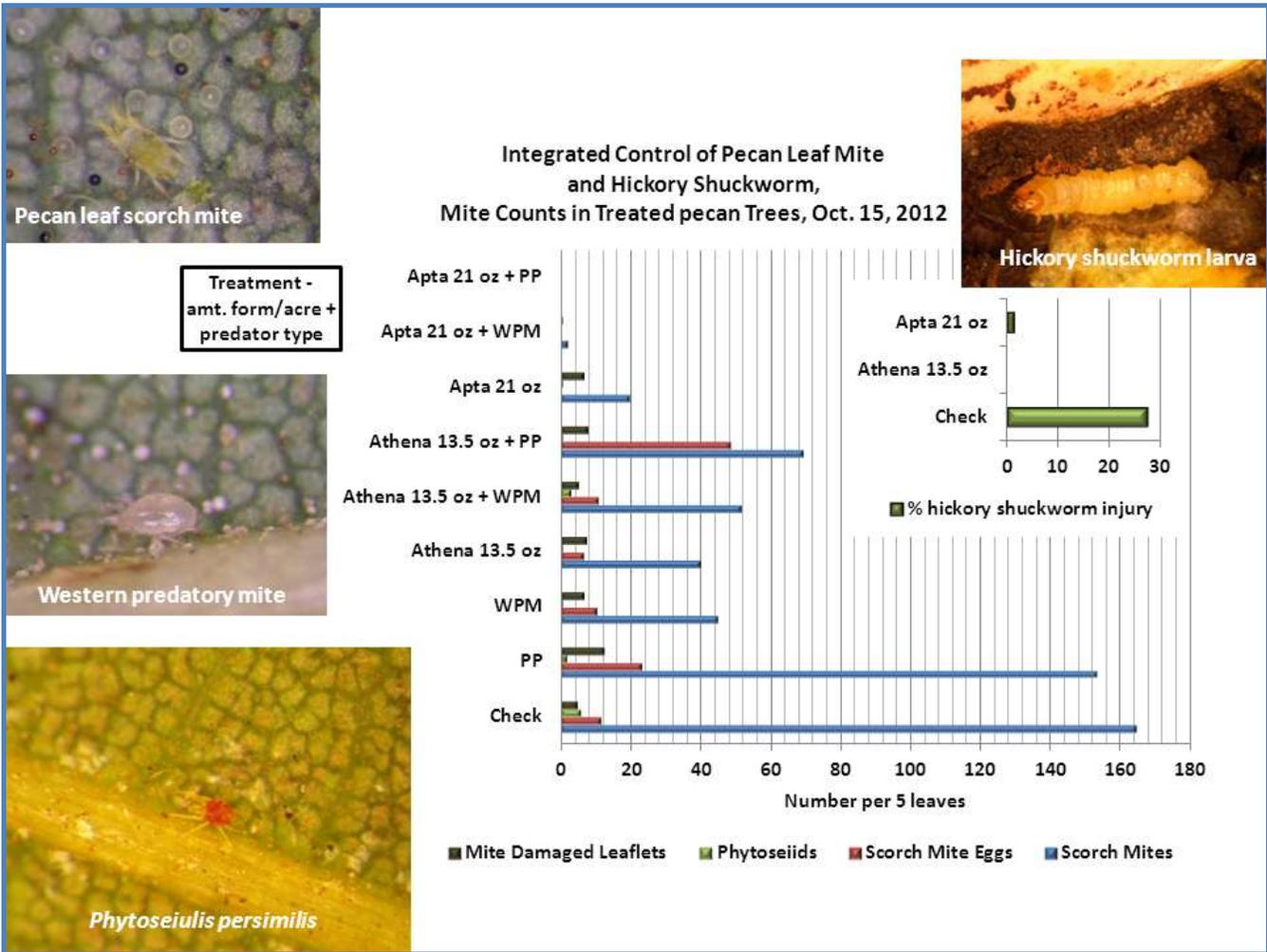
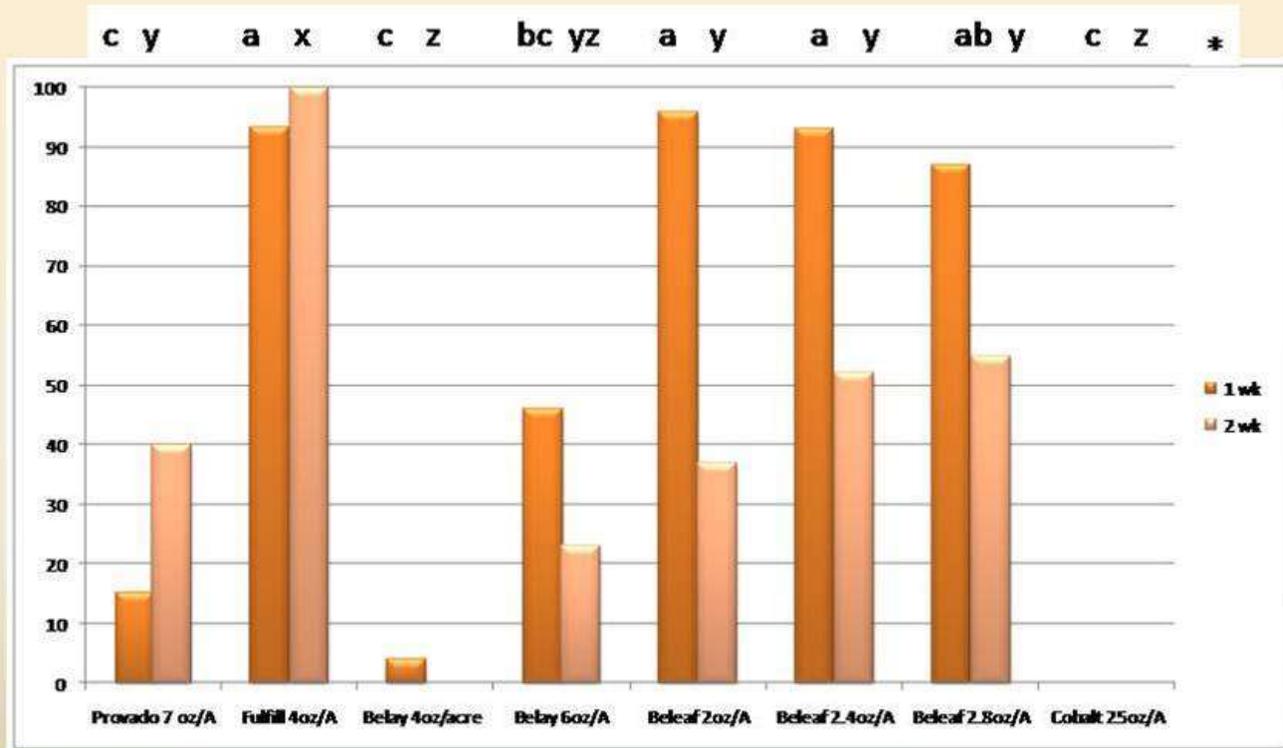


Figure 13. The effect of insecticides applied for control of the hickory shuckworm on the biological control of pecan leaf scorch mite with release of two predatory mite species – WPM= western predatory mite and PP = *Phytoseiulus persimilis* – in a control field experiment on 27 yr-old ‘Desirable’ pecan trees at the Ponder Farm, Tift Co., GA

## Efficacy of insecticides against yellow aphids – June, 2010

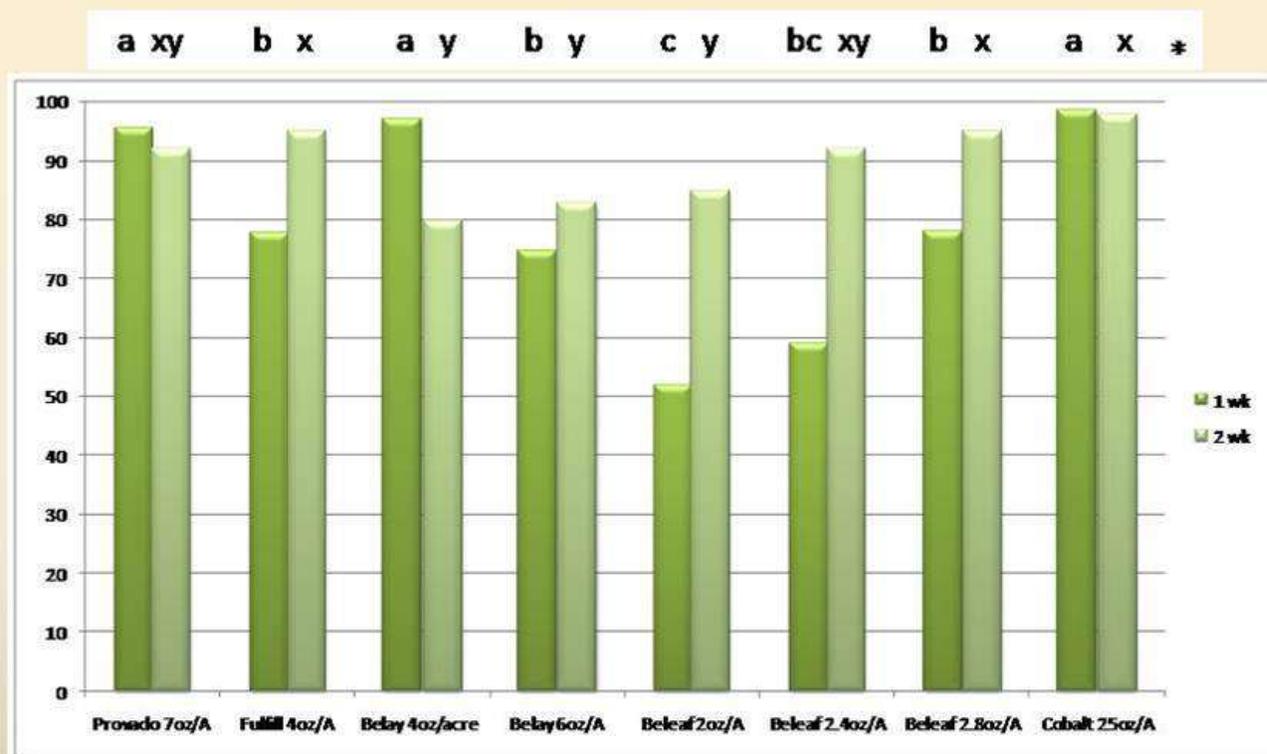


**Insecticide product name and amount of formulation applied per acre in 100 gal spray**

**\*Means with the same letter are not significantly different . LSD Test P<0.05.**

Fig.14. Efficacy of insecticides against yellow aphids, 2010.

## Efficacy of insecticides against black pecan aphids – Sept., 2010



**Insecticide product name and amount of formulation applied per acre in 100 gal spray**

**\*Means with the same letter are not significantly different . LSD Test P<0.05.**

Fig. 15. Efficacy of insecticides against black pecan aphids, 2010.

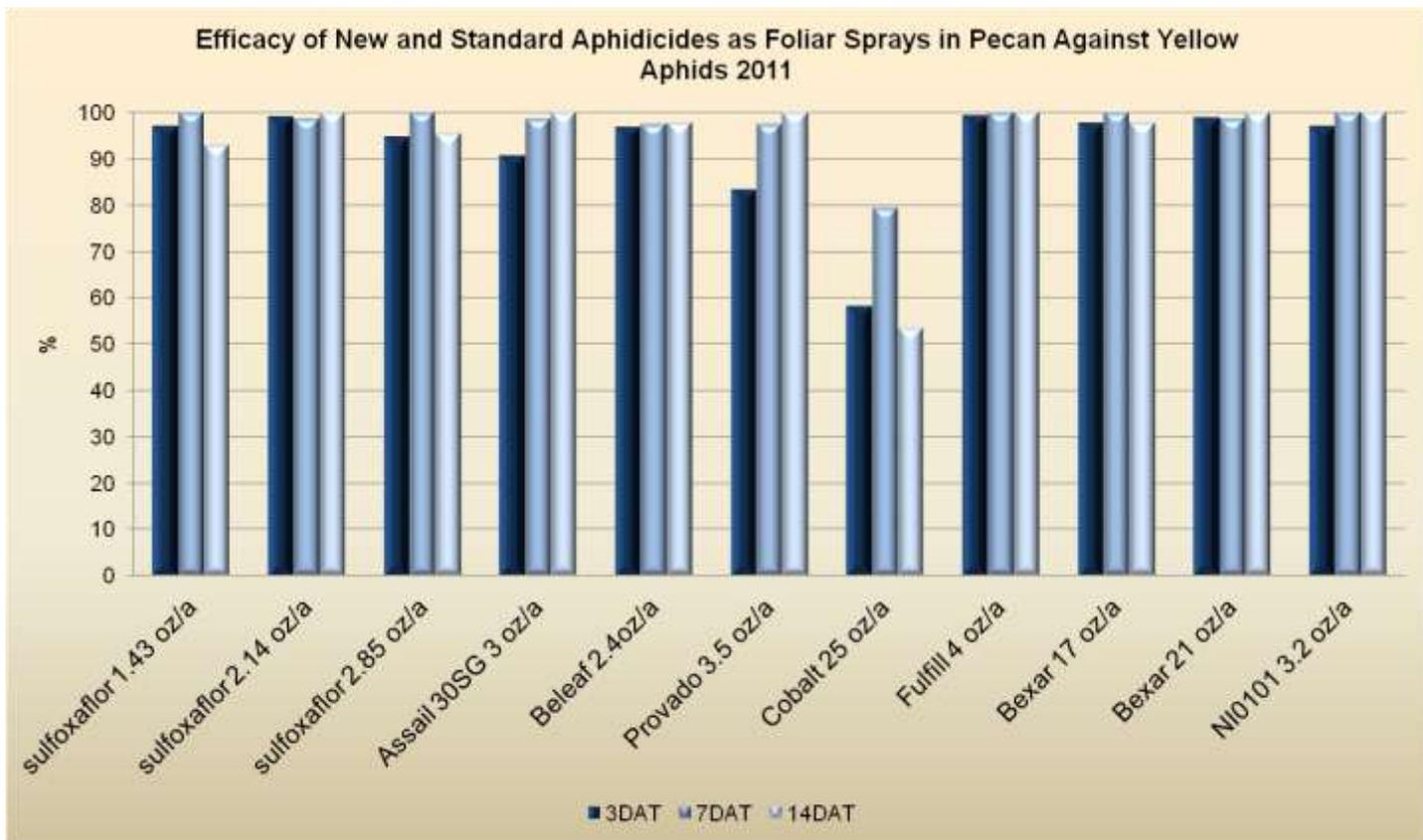


Fig. 16. Efficacy of insecticides against yellow pecan aphids, 2011.

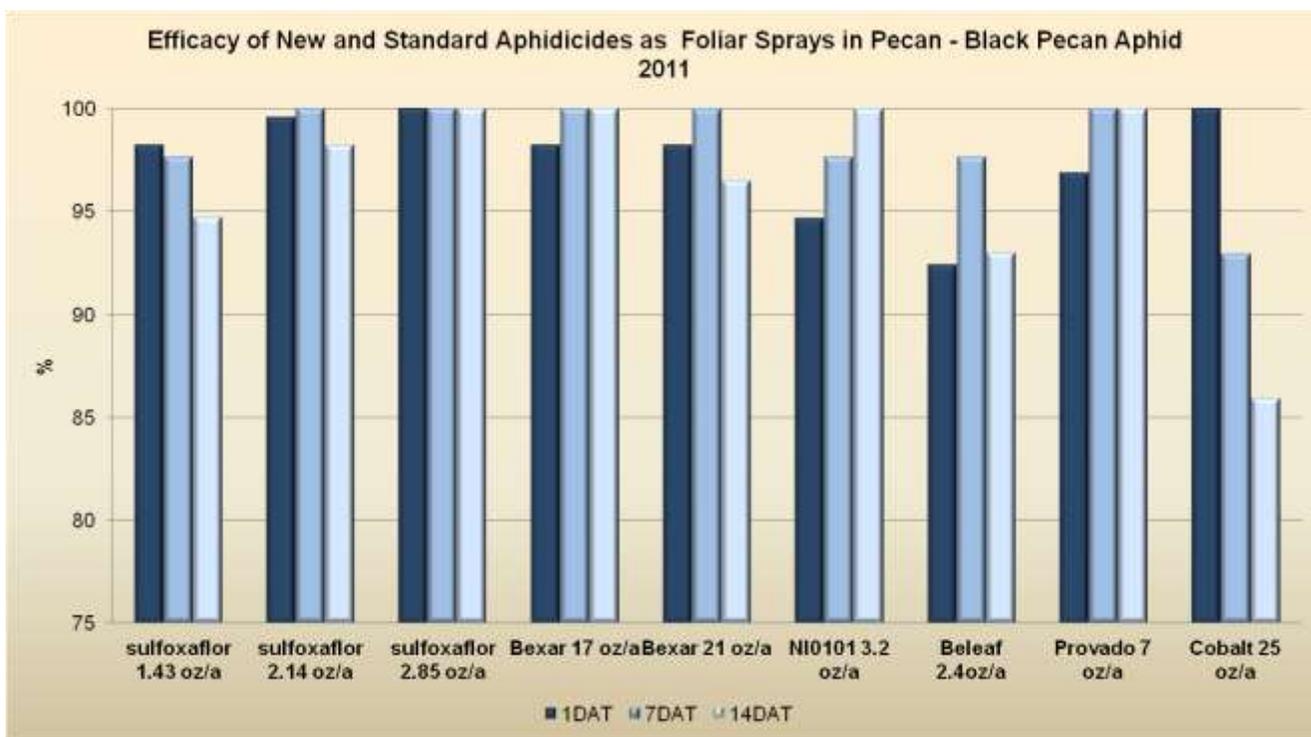


Fig. 17 Efficacy of insecticides against black pecan aphids, 2011.

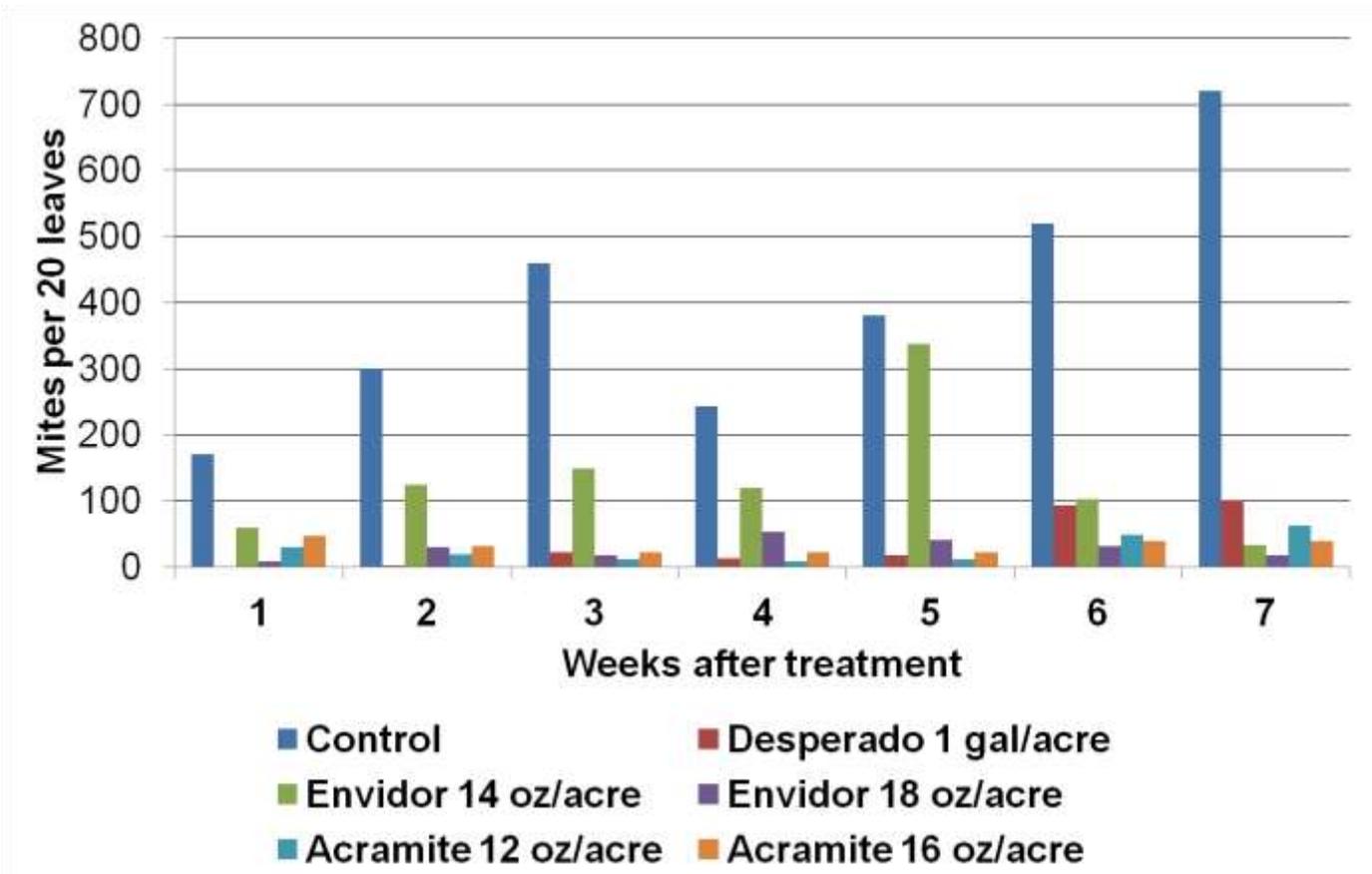


Fig. 18. Efficacy and residual action of miticides against pecan leaf scorch mites, 2011.

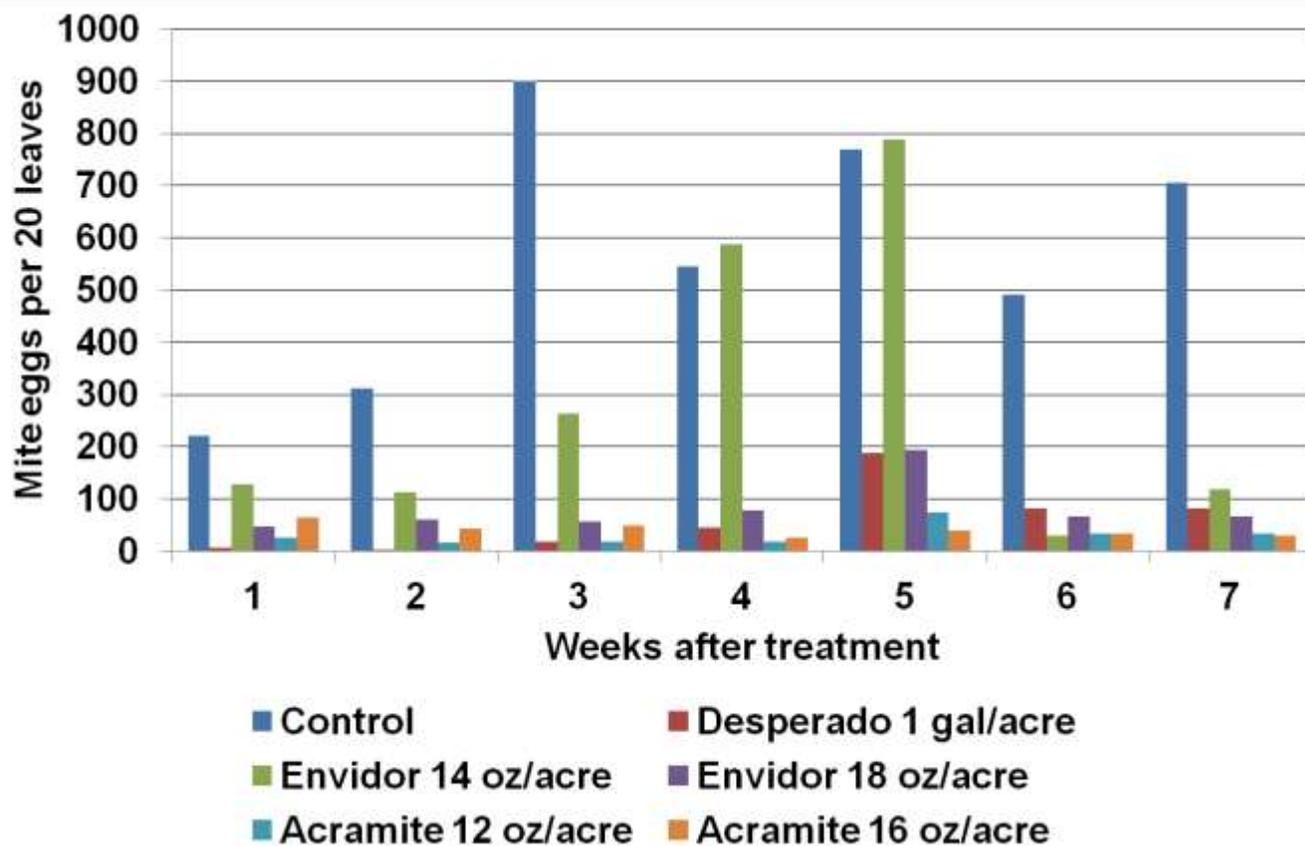


Fig. 19. Efficacy and residual action of miticides against pecan leaf scorch mite eggs, 2011.

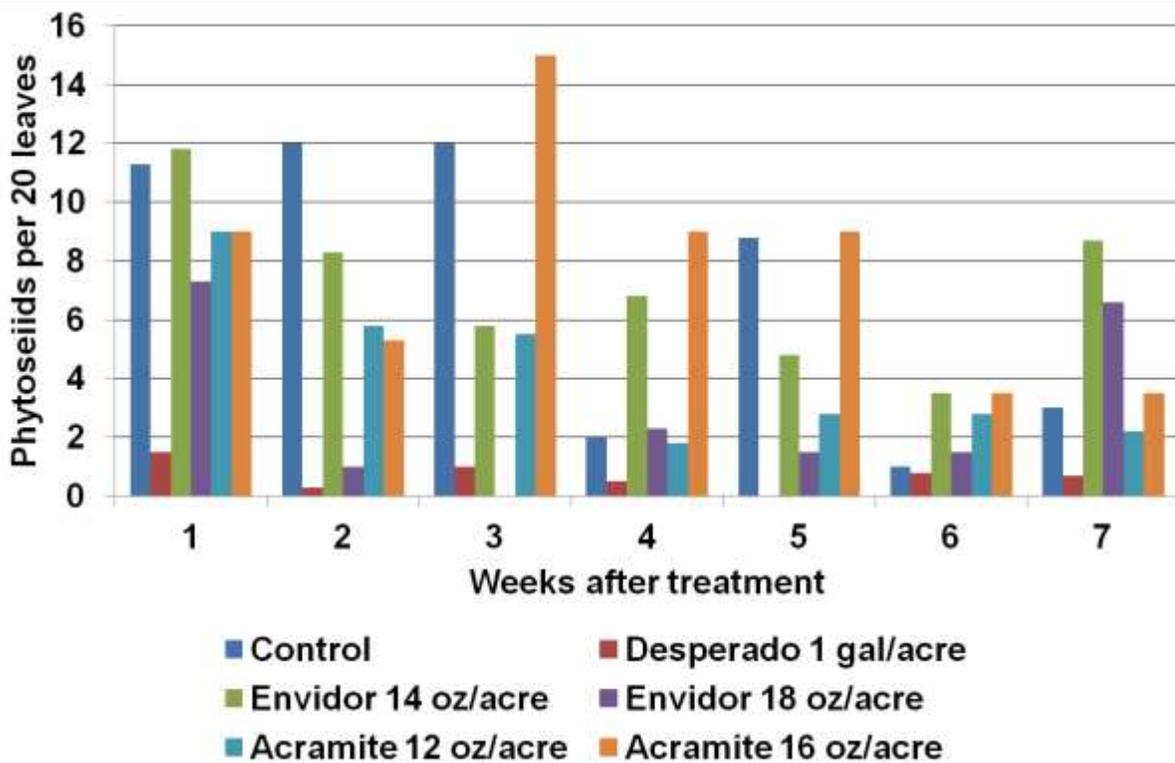


Fig. 20. Impact and residual action of miticides against predatory mite abundance, 2011.

**Additional Information**

I. Analyzed data tables for figures 3, 4, 5 and 6.

Table. 1. Data for figure 3.

**Sept. 3, 2012**

<u>Treatment</u>	<u>oz. form./A</u>	<u>Aphid Abundance on indicated sampling date.</u>		
		<u>blackmargined aphid</u>	<u>black pecan aphid</u>	<u>yellow pecan aphid</u>
CHECK		2.50 ab	14.50 a	0.25 a
ASSAIL 30SG	8	4.25 a	0.38 b	0.25 a
BELEAF 50SG	2	0.38 b	0.00 b	0.13 a
BELEAF 50SG	2.4	0.50 b	0.00 b	0.25 a
BELEAF 50SG	2.8	1.00 b	0.13 b	0.00 a
SULFOXAFLO SC 240 g ai/l	1.43	0.25 b	0.13 b	0.00 a
SULFOXAFLO SC 240 g ai/l	2.17	0.50 b	0.00 b	0.13 a
SULFOXAFLO SC 240 g ai/l	2.85	0.00 b	0.00 b	0.00 a
APTA SC + Dyne-Amic	14	0.75 b	1.25 b	0.13 a
APTA SC + Dyne-Amic	17	0.75 b	1.00 b	0.00 a
APTA SC + Dyne-Amic	21	1.50 b	1.00 b	0.25 a
PYRIFLUQUIZANON SC + Dyne-Amic	1.9	0.13 b	0.00 b	0.00 a
PYRIFLUQUIZANON SC + Dyne-Amic	2.54	0.00 b	0.00 b	0.00 a
PYRIFLUQUIZANON SC + Dyne-Amic	3.17	0.00 b	0.00 b	0.00 a

Aphids nymphs and adults #/5 leaves (Averages for 3-d post-treatment)\*

black pecan

\*Means in the same column and followed by the same letter are not significantly difference (ANOVA, LSD Test (P<0.05)).

Table 2. Data for figure 4.

**Sept. 7, 2012**

<u>Treatment-Formulation</u>	<u>oz. form./A</u>	<u>Aphid nymphs and adults #/5 leaves (Averages for 7-d post-treatment)*</u>		
		<u>blackmargined aphid</u>	<u>black pecan aphid</u>	<u>yellow pecan aphid</u>
CHECK		2.13 a	11.13 a	0.25 a
ASSAIL 30SG	8	0.00 b	0.25 b	0.25 a
BELEAF 50SG	2	0.00 b	0.00 b	0.00 a
BELEAF 50SG	2.4	0.25 b	0.25 b	0.00 a
BELEAF 50SG	2.8	0.00 b	0.00 b	0.00 a
SULFOXAFLO SC 240 g ai/l	1.43	0.25 b	1.00 b	2.00 a
SULFOXAFLO SC 240 g ai/l	2.17	0.25 b	0.50 b	0.00 a
SULFOXAFLO SC 240 g ai/l	2.85	0.00 b	0.00 b	0.00 a

APTA SC + Dyne-Amic	14	0.00 b	0.00 b	1.25 a
APTA SC + Dyne-Amic	17	0.25 b	0.00 b	0.00 a
APTA SC + Dyne-Amic	21	0.00 b	0.25 b	0.50 a
PYRIFLUQUIZANON SC + Dyne-Amic	1.9	0.00.b	0.00 b	0.00 a
PYRIFLUQUIZANON SC + Dyne-Amic	2.54	0.00.b	0.00 b	0.00 a
PYRIFLUQUIZANON SC + Dyne-Amic	3.17	0.00.b	0.00 b	0.00 a

\*Means in the same column and followed by the same letter are not significantly difference (ANOVA, LSD Test (P<0.05))

Table 3. Data for figure 5.

**Sept. 14, 2012**

<u>Treatment</u>	<u>OZ/A</u>	<u>Aphid nymphs and adults #/5 leaves (Averages for 14-d post-treatm</u>		
		<u>blackmargined aphid</u>	<u>black pecan aphid</u>	<u>yellow pecan aphid</u>
CHECK		5.75 a	1.88 a	9.13 a
ASSAIL 30SG	8	3.25 a	0.50 a	2.50 b
BELEAF 50SG	2	0.00 b	0.00 a	0.50 c
BELEAF 50SG	2.4	0.00 b	1.25 a	2.50 b
BELEAF 50SG	2.8	0.00 b	0.50 a	2.00 b
SULFOXAFLO R SC 240 g ai/l	1.43	1.00 b	0.00 a	1.00 bc
SULFOXAFLO R SC 240 g ai/l	2.17	0.00 b	0.00 a	0.00 c
SULFOXAFLO R SC 240 g ai/l	2.85	0.25 b	0.00 a	1.00 bc
APTA SC + Dyne-Amic	14	0.00 b	0.75 a	0.00 c
APTA SC + Dyne-Amic	17	0.25 b	1.25 a	0.00 c
APTA SC + Dyne-Amic	21	0.25 b	0.00 a	0.00 c
PYRIFLUQUIZANON SC + Dyne-Amic	1.9	0.00 b	0.25 a	0.75 c
PYRIFLUQUIZANON SC + Dyne-Amic	2.54	0.25 b	0.25 a	1.50 bc
PYRIFLUQUIZANON SC + Dyne-Amic	3.17	0.00 b	0.00 a	0.75 c

\*Means in the same column and followed by the same letter are not significantly difference (ANOVA, LSD Test (P<0.05))

Table 4. Data for figure 6.

<b>Sept 21, 2012</b>		<u>Aphid nymphs and adults #/5 leaves (Averages for 21-d post-treatment)*</u>		
<u>Treatment</u>	<u>oz. form/A</u>	<u>blackmargined</u>	<u>black pecan aphid</u>	<u>yellow pecan aphid</u>
CHECK		3.38 a	2.12 a	6.63 a
ASSAIL 30SG	8	1.00 b	0.00 a	0.75 b
BELEAF 50SG	2	2.00 ab	0.00 a	1.00 b
BELEAF 50SG	2.4	0.75 b	0.00 a	0.25 b
BELEAF 50SG	2.8	2.00 ab	1.50 a	1.50 b
SULFOXAFLO SC 240 g ai/l	1.43	1.00 b	0.00 a	0.00 b
SULFOXAFLO SC 240 g ai/l	2.17	1.25 b	1.50 a	1.50 b
SULFOXAFLO SC 240 g ai/l	2.85	0.25 b	0.25 a	0.00 b
APTA SC + Dyne-Amic	14	2.75 a	0.50 a	1.00 b
APTA SC + Dyne-Amic	17	0.50 b	0.25 a	0.25 b
APTA SC + Dyne-Amic	21	1.50 ab	1.25 a	1.50
PYRIFLUQUIZANON SC + Dyne-Amic	1.9	1.25 ab	0.00 a	1.50 b
PYRIFLUQUIZANON SC + Dyne-Amic	2.54	0.00 b	0.00 a	0.75 b
PYRIFLUQUIZANON SC + Dyne-Amic	3.17	0.25 b	0.25 a	0.50 b

\*Means in the same column and followed by the same letter are not significantly difference (ANOVA, LSD Test (P<0.05))

## **Additional Information**

### II. Additional Photographs – Application of Integrated Pecan Leaf Scorch Mite Control a Muckalee Plantation in 2013



Step 1: Wetting the foliage by spray water with an airblast sprayer.



Step. 2: Application of live western predatory mites to the wet foliage on a corn grit formulation.

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## **16. University of Georgia – Increasing Competitiveness of Georgia’s Cut Flower and Greenhouse Industry-Phase 2 – Final Performance Report**

### **1. Project Summary**

The specific need addressed by this project is the current lack of competitiveness of Georgia’s cut flower industry. Currently, potential for success in growing cut flowers in Georgia is dependent on producing a flower that can’t be shipped in from offshore or that can’t be produced and shipped at a better quality than that provided locally. Gerbera daisies are an example of cut flowers that can be locally competitive because offshore gerberas are shipped dry and their “keeping” quality is not as good as Georgia grown flowers that are delivered in water and have a better shelf life. Wholesalers prefer to buy flowers that have been kept moist.

Georgia farmers can compete better than offshore producers in this arena, but are limited in production by leafminers that are resistant to insecticides. Recent efforts to control leafminers with biological agents have

met with failure because other secondary pest (aphids, mites, whiteflies or thrips) outbreaks requiring intervention with insecticides, which disrupts biological controls of the primary pest leafminers by killing the biological control agents.

In the previous Phase I aspect of this 3- Phase project, we demonstrated that leaf miners could be successfully controlled with parasitic wasps. Phase II of the project investigated the compatibility of pesticides, commonly used against leafminers, mites, thrips, whiteflies, and fungal pathogens, with natural enemies of the leafminer. We studied the compatibility of various pesticides used in commercial greenhouse management with two biological control agents: a leafminer parasitoid (*Diglyphus isaea* (Walker)), and a predatory mite (*Neoseiulus californicus* (McGregor)). These natural enemies were exposed to miticides, fungicides, and insecticides used against leafminers, thrips and whiteflies according to label directions in laboratory vial assays, after which mortality at 12, 24, and 48 hours (h) was recorded. Greater mortality of predatory mites than leafminer parasitoids was observed overall, illustrating that fewer pesticides were compatible with predatory mites compared with the parasitoid. However, some commonly used pesticides were found to cause high mortality to both the leafminer parasitoid and predatory mites. Twospotted spider mite (*Tetranychus urticae* Koch) infestations often disrupt leafminer (*Liriomyza trifolii* (Burgess)) biocontrol programs. Therefore, potentially compatible miticides (bifenazate, hexythiazox, spiromesifen, acequinocyl, etoxazole, and clofentezine) identified in laboratory trials were also evaluated in a greenhouse study to determine if they were compatible with leafminer parasitism during a four-week period. All six of them were compatible with leafminer biocontrol and did not affect parasitoid survivability in the long run.

## 2. Project Approach

The Serpentine leafminer *Liriomyza trifolii* (Burgess) (Diptera: Agromyzidae) is a key pest in protected cultivation of ornamentals and vegetables in general. In greenhouse gerberas, apart from them as primary pests, secondary/ occasional pests require grower attention. *L. trifolii* is chemically resistant and effective control cannot be achieved by use of pesticides, while secondary pests can. Natural enemies have been successful in controlling leafminer populations where harmful pesticide use has been avoided. Pesticides when used, often disrupts leafminer biocontrol often resulting in excess use of pesticides for ineffective control of pests. We investigated the compatibility of pesticides, commonly used against leafminers, mites, thrips, whiteflies, and fungal pathogens, with natural enemies of *L. trifolii* (*Diglyphus isaea* (Walker) (Hymenoptera: Eulophidae)) and *T. urticae* (*Neosiulus californicus* (McGregor)).

We evaluated the compatibility of commonly used pesticides in greenhouse gerberas with two natural enemies: a leafminer parasitoid (*Diglyphus isaea*), a wasp that feeds on the immature leafminer as part of its life cycle, and a predatory mite (*Neoseiulus californicus*), a mite that is predaceous on pest mite species (Rincon- Vitova Insectaries, Ventura, CA). There are at least six major pests that are targeted in greenhouse gerbera management: leafminers (*Liriomyza trifolii*), mites (*Tetranychus urticae*), thrips (*Frankliniella occidentalis*), whiteflies (*Trialeurodes vaporariorum*, and *Bemisia tabaci*), aphids (*Myzus persicae*), and pathogens causing powdery mildew (from the genera *Podosphaera*, *Erysiphe*, *Leveillula*, *Golovinomyces*, and *Oidium*). Hence at least five groups of pesticides (Table 1) need to be evaluated, because aphids are often targeted by the same insecticides but at a lower rate than when used against pests like whiteflies or leafminers. Following a laboratory study in which the toxicity of these chemicals within 48 h was documented, pesticides that caused the least mortality from among the treatments in the miticide group were used in a greenhouse study to investigate the toxicity post 48 h.

### Laboratory Study

**Experimental Protocol.** Pesticides selected for the lab assays are commonly used in greenhouse management. Nine pesticides and a water control were evaluated. Since pesticides recommended against aphids are also used against other pests but at a higher rate, they were not evaluated as a separate group. Previously documented vial assay methods were modified and employed as leaf dip assays for the parasitoid wasps, and as pesticide swirl assays for predatory mites.

**Leafminer parasitoid (*D. isaea*):** Gerbera plugs that had not previously been treated were obtained from Speedling Inc., Blairsville, GA. A single leaf was removed from the plug and covered with cotton around the petiole and inserted into one end of a 1.5 cm long section of Tygon® tubing and hydrated when necessary. The leaf was then completely dipped in the respective treatments (aqueous pesticide solutions at label rates or water control) for 10 seconds each and allowed to dry for at least 3 h. After the inside of the vial was streaked with honey (as a food source for the parasitoids), 10 *D. isaea* parasitoids were introduced. The tubing with the leaf inside was then inserted at the neck region of the vial and sealed using Parafilm™.

**Predatory Mites (*N. californicus*):** A solution (10-15 ml) of the designated treatment was poured into each glass vial and swirled for even coverage over the surface of the glass. After allowing at least 3 h for drying, a drop of honey was streaked inside each vial, and then 10 adult *N. californicus* mites were inserted and the vial capped.

**Design and Data Collection.** Five experiments where an experimental unit was a vial were conducted, and the experiment consisted of 10 replicates for each of the 10 treatments, all of which were placed on a lab counter with a 14 h light: 10 h dark period and held at 22-25°C. Each experiment was repeated on two other days for a total of 15 trials. Live adult parasitoids and adult mites (viewed through a microscope) were counted 12, 24, and 48 h after the treatment. Any movement by the natural enemy designated them as alive while the lack of movement when disturbed resulted in counting them as dead.

### **Greenhouse Miticide Study**

**Location and Experimental design.** The study was conducted at the UGA-Griffin campus. After selecting and housing 170 potted gerbera plants of the Gerbera ‘Festival Mini Yellow Shade’ cultivar in similar growth stages, an excess of 500 adult *L. trifolii* collected from grower and research greenhouses were released into the greenhouse. Treatments included 6 miticides (bifenazate, hexythiazox, spiromesifen, acequinocyl, etoxazole, and clofentezine) and a (water) control and were applied a week after the flies were introduced. Each cage (BugDorm rearing cage, # 1452, BioQuip Products, Rancho Dominguez, CA) was an experimental unit and housed 4 potted plants for a total of 168 plants in 42 cages. Twenty-four hours later, 10-12 parasitoids (*D. isaea*) purchased from Rincon Vitova Insectaries Inc., Ventura, CA, were released into each cage. During the test period, the greenhouse was maintained at 25-32°C and 85% humidity.

**Data Collection and Evaluation.** Seven days after the parasitoids were released, three leaves were sampled from each experimental unit and inspected under a microscope for parasitoid and leafminer activity. After the first sampling date, cages were removed so that the leafminer pressure and the parasitoid availability would be equal for all the plants, while residual toxicity would determine the actual activity of leafminer and *D. isaea*. The greenhouse was flooded with an excess of 600 adult leafminers and 72 h later, 250 parasitoids. Sampling was then repeated every seventh day thereafter for three weeks spanning June 14 through July 5, 2011.

### **3. Goals and Outcomes Achieved**

Expected Measurable Outcomes:

The GOAL of this project is to develop and deploy alternative methods for management of pests limiting cut flower production, specifically gerbera production as the model system.

BASELINE 2009: Insecticide resistant leafminers are unable to be controlled with currently available insecticides.

Phase I Project: TARGET 2010: Leafminers can be controlled with biocontrol agents

**Phase II Project: TARGET 2011: Secondary pests can also be controlled with alternative tactics without disrupting biocontrol of leafminers**

Results:

### **Laboratory study**

Following the criteria accepted by IOBC, chemicals tested in laboratories are divided into four categories based on their toxicity. Those causing < 30% mortality are considered harmless, 30-79% slightly harmful, 80-98% moderately harmful, and > 99% considered harmful. The same criteria were used to elucidate our lab experiment results.

**Leafminer chemicals (*D. isaea* at 48 h).** Novaluron and petroleum oil were harmless (<30% mortality within 48 h in at least 2 out of the 3 trials). Azadirachtin, cyromazine, and acetamiprid were slightly harmful, causing mortality in the range of 30-79%. Lambda cyhalothrin was found to be moderately harmful with a mortality of 80-98%. Dinotefuran and bifenthrin were harmful and caused mortality > 99% within 48 h (F range = 27.04 – 47.96; df = 9, 99; P < 0.0001) Though spiromesifen was tested together with leafminer chemicals, it actually is not labeled for use against leafminers. It was tested at the whitefly rate as an additional whitefly chemical.

**Leafminer chemicals (*N. californicus* at 48 h).** At the 48 h mark, none of the pesticides were harmless to the predatory mites Cyromazine, novaluron and petroleum oil were found to be slightly harmful (30-79% mortality). Azadirachtin was moderately harmful, with 80-98% mortality; dinotefuran, bifenthrin, lambda cyhalothrin, and acetamiprid were harmful and caused > 99% mortality in the predatory mites (f range= 16.84-46.24; df= 9, 99; p value= <0.0001). The low mortality in the cyromazine treatment and for novaluron at the 48 h mark does not ensure their harmlessness though because of their being insect growth regulators (IGRs) with effects not showing up until later.

**Miticides (*D. isaea* at 48 h).** Clofentazine and acequinocyl were harmless and caused < 30% mortality within 48 h . Bifenazate, hexythiazox, spiromesifen, etoxazole, and milbemectin were slightly harmful and caused 30-79% mortality. Abamectin caused 80-98% mortality and spinosad > 99%, and these were moderately harmful and harmful to *D. isaea* respectively (f range= 17.46- 84.97; df= 9, 99; p value= <0.0001). However most of the miticides that demonstrated lower mortality at the 48 h mark were IGRs and only a prolonged study (Greenhouse Study detailed below) could confirm if they are actually safe to *D. isaea* for a longer period.

**Miticides (*N. californicus* at 48 h).** Etoxazole, bifenazate, hexythiazox, clofentazine, and spiromesifen were slightly harmful and caused 30-79% mortality (f range= 12.85- 43.56; df= 9, 99; p value= <0.0001) . However, a majority of them being IGRs and specifically miticides would not necessarily make them compatible with a biological control program involving predatory mites unless selective toxicity to pest mite species is proven. While acequinocyl caused 80-98% mortality, abamectin, spinosad and milbemectin caused > 99% mortality even at the 48 h mark and hence were harmful.

**Whitefly chemicals** (*D. isaea* at 48 h). Pyriproxyfen, and spiromesifen caused < 30% mortality at the 48 h mark (f range= 20.07- 24.71; df= 9, 99; p value= <0.0001 and hence were considered harmless to *D. isaea*. Spirotetramat, flonicamid, pyridaben, and chlorpyrifos at their respective median label rates were found to cause 30-79% mortality. Pyriproxyfen is an IGR and caused low mortality, while spirotetramat and spiromesifen are not IGRs and can be components in an IPM program. Kinoprene, thiamethoxam, imidacloprid, and lambda cyhalothrin caused 80-98% mortality and are probably best not used in a biological based IPM program.

**Whitefly chemicals** (*N. californicus* at 48 h). Flonicamid, spirotetramat, thiamethoxam, and spiromesifen were slightly harmful, causing 30-79% mortality within 48 h (f range= 21.7- 24.94; df= 9, 99; p value= <0.0001). Pyriproxyfen, and chlorpyrifos caused 80-98% mortality (moderately harmful), while kinoprene, imidacloprid, pyridaben and lambda cyhalothrin caused > 99% mortality (harmful) in the predatory mites.

**Thripicides** (*D. isaea* at 48 h). Flonicamid, cyfluthrin, insecticidal soap, *Beauveria bassiana*, and acetamiprid were found to be slightly harmful because they inflicted mortality within the range of 30-79% in 48 h (f range= 31.2- 40.96; df= 9, 99; p value= <0.0001). While abamectin, fluvalinate, and chlorfenapyr caused 80-98% mortality (moderately harmful) in *D. isaea*, spinosad was responsible for >99% (harmful).

**Thripicides** (*N. californicus* at 48 h). Flonicamid and insecticidal soap caused 30-79% mortality (slightly harmful), while *B. bassiana*, and acetamiprid were moderately harmful and caused 80-98% mortality (f range= 15.04- 32.61; df= 9, 99; p value= <0.0001). Abamectin, spinosad, cyfluthrin, fluvalinate, and chlorfenapyr, caused > 99% mortality in the mites (harmful).

**Fungicides** (*D. isaea* at 48 h). All tested fungicides showed lower than 79% mortality in *D. isaea* within 48 h and hence qualify to be used in IPM programs. Butanone, fosetyl-aluminum, azoxystrobin, potassium bicarbonate, pyraclostrobin, copper sulfate, and piperalin caused < 30% and hence are considered harmless (f range= 1.53- 4.92; df= 9, 99; p value range= <0.0001- 0.15). Rosemary oil (EcoSmart), and sulfur were the only ones that caused higher mortality but still remained within 30-79% and hence are considered only slightly harmful.

**Fungicides** (*N. californicus* at 48 h). Butanone and copper sulfate caused 30-79% mortality in mites (f range= 16.11- 70.13; df= 9, 99; p value= <0.0001) hence slightly harmful. Sulfur was moderately harmful and caused 80-98% mortality while fosetyl-aluminum, rosemary oil, azoxystrobin, potassium bicarbonate, pyraclostrobin, and piperalin caused >99% mortality (harmful) in *N. californicus*.

While there were slight differences in individual mortality values attributed to specific pesticides, the ones consistently inflicting high mortality on natural enemies were clearly identified. In general, more pesticides were compatible with the parasitoids (*D. isaea*) than the predatory mites (*N. californicus*). Salient points distilled from the results above are given below (df= 9, 99; f values ranged from 12- 119; p values <0.0001).

1. Six miticides cause less mortality than the industry standard, abamectin, in the parasitoid *D. isaea* even at 48 h.
2. Spinosad, a good control for thrips, caused high mortality in the parasitoid.
3. Mortality of *D. isaea* parasitoids due to the fungicides did not vary significantly from the water control (df= 9, 99; f ranged from= 1.53- 5.5; p value ranged from <0.0001 -0.1511), but they inflicted high mortality on the predatory mites *N. californicus*

## Greenhouse Study

Treatments did not differ from the control in parasitism rates over 4 weeks, confirming compatibility observed in laboratory studies (f range= 0.22- 1.38; df= 6, 41; P values range= 0.2615- 0.9673). The fluctuation in parasitism level was not restricted to the treatments but the control also followed the same trend. There was no significant difference between the treatments and control in any of the parameters that were additionally tested: average number of leafminers (f range= 0.95- 1.27; df= 6, 41; P values range= 0.3016 - 0.4774) average number of parasitoids (f range= 0.18- 1.54; df= 6, 41; P values range= 0.1985 - 0.9800) (Appendix Table 4), number of live leafminers (f range= 0.95- 1.27; df= 6, 41; P values range= 0.3016 - 0.4774) and total (sum of live and dead) leafminers (f range= 0.31- 1.51; df= 6, 41; P values range= 0.1964 - 0.9276) . Parasitism, which started high in the first week, fell in the second week and returned to its highest level by the fourth week.

**Effects on *D. isaea*.** Since *L. trifolii* are often chemically resistant, most of the chemicals labelled for use against them rarely control populations to a significant level. However, that seldom serves as an incentive to not spray pesticides in the greenhouses. Growers often rely on pesticides as the only solution to pest problems as they (when effective) allow for tangible and observable effects immediately, as opposed to biological control methods which take more time and do not eliminate a pest completely. The knowledge that novaluron, petroleum oil, azadirachtin, cyromazine and acetamiprid are at most slightly harmful to the leafminer parasitoid could encourage the use of such chemicals for leafminer control when inevitable. Mites are the most commonly encountered among the secondary pests in this system and chemicals are effective in controlling them. Within 48h though, there were more miticides that were potentially harmless to the leafminer parasitoid than harmful. That abamectin is toxic to parasitoids has been shown previously. Our results on the effect of spinosad corroborate similar findings in protected cultivation and field situations where high mortality was observed in hymenopterans in spite of its being accepted by many as a biorational pesticide . This also cautions and emphasizes the importance of individual components of an integrated management program in cut flowers. Spinosad as a miticide has a recommended rate of 22 oz/100 gal and as a thrips material 6 oz / 100 gal. Even though less toxic at the lower rate, spinosad caused severe mortality to the leafminer parasitoid at both rates. Abamectin is the industry standard for mite control and spinosad is an effective thrips control material. Their both being harmful to natural enemies removes significant control options from a grower's pesticide armory.

Apart from the IGRs, only spirotetramat and spiromesifen demonstrated potential as whitefly insecticides that could integrate with biological control of the leafminer. However, both are in the insecticide class 23 which inhibits acetyl CoA carboxylase (IRAC 2011). This provides few options for rotation of pesticides. As a thrips control material, flonicamid, cyfluthrin, acetamiprid, insecticidal soap, and *B. bassiana* were seemingly safe to the leafminer parasitoid, but from a grower's perspective, the natural products are not first choice options because they do not immediately show effects. Flonicamid comes under the chemical class 9c and is a feeding blocker (IRAC 2011), while the natural products effect control in other ways. Cyfluthrin, which comes in the pyrethroid class, and acetamiprid, which is a neonicotinoid, could be effective components though. Spinosad is effective for thrips control, but demonstrated negative effects on parasitoid populations. Fungicides in general were found to cause low mortality in the parasitoid wasp *D. isaea*. EcoSmart, a ready-to-use rosemary oil concoction, and sulfur were the only fungicides among those tested that caused > 30% mortality in *D. isaea*, but still less than 79%, and thus would be usable in IPM programs. Our data suggest that fungicides do not cause immediate negative effects on leafminer parasitoids.

**Effects on *N. californicus*** Mites are the most frequently encountered secondary pests in greenhouse gerberas. Unless a miticide specifically toxic to pest mite species is available, integration of miticides and predatory mites would not be possible in an IPM program. Cyromazine is accepted as being safe for natural enemies in general (Biobest , Koppert), and our study noted the same. However, we observed heightened

activity by the surviving mites in the vial closer to the lid. Whether the phenomenon is a synergistic effect or a repellent effect needs closer investigation

From among the whitefly chemicals, flonicamid, thiomethoxam, spiromesifen, and spirotetramat were only slightly harmful to predatory mites. Spiromesifen and spirotetramat were safe options also to the leafminer parasitoids and hence add to the number of rotational options. Among commonly used thrips control materials, only flonicamid and insecticidal soap showed potential to integrate with pest mite biocontrol. While miticides in general were not completely toxic to the insect natural enemy (leafminer parasitoid), insecticides in general seemed to harm the non-insect natural enemy (predatory mite).

The salient inference from the lab assays is identification of pesticides that can be safely integrated with a biological control regime. Focusing on safety of the leafminer parasitoid, *D. isaea*, primarily, there are slightly more pesticides that are potentially compatible than with predatory mites. Reevaluating our control options from the available compatible chemistries to effectively rotate, and convincing growers to adopt only those options in an IPM program would be the challenge going forward.

### **Greenhouse Miticide Study**

Mites being the most frequently encountered among the secondary pests makes their control an important component in any IPM program in this system. Our prolonged greenhouse study showed that the residual effect of miticides was not detrimental to *D. isaea* in the long run. Even though the parasitism rate dropped below 30% in the second week, the fact that the fluctuation occurred in all treatments, including the control, and that there were no differences in other parameters that were analyzed, indicates that the effect was due to life history traits. After one week of high parasitism (> 70%), there were very few leafminers for the parasitoids to parasitize the following week. All the treatments followed a similar pattern and reached a peak parasitism by the fourth week, which also meant that the miticides did not detrimentally affect *D. isaea* development in the weeks prior (2nd or 3rd week) when the parasitoids were in younger and more vulnerable stages. Results indicated that bifenthrin, hexythiazox, spiromesifen, acequinocyl, etoxazole, and clofentazine are not injurious at least in the long run for the development and population buildup of *D. isaea*. This gives us valuable information for integrating biological and chemical control to keep the most important pests in this system in check. The primary pest can be controlled using its natural enemy, and the major secondary pest can be controlled by rotating safe chemicals that do not harm the leafminer parasitoid, *D. isaea*.

Additionally, from these results, we would be able to integrate options to control the primary pest in this system (leafminer) using its natural enemies and use less disruptive options from among the chemicals to control the secondary pests. The benefits from such a strategy are multifold, 1) reduced pesticide footprint in the premises and environment, 2) enhanced safety to the workers and producers alike, 3) better management of the pest and diseases leading to a better crop, and 4) overall a sustainable production system. With the increase of insecticide resistant pests, the possibility of insecticide resistant natural enemies will need to be explored.

#### **4. Beneficiaries**

The beneficiaries of the project are the greenhouse floriculture/ cutflower industry in Georgia. Georgia's floriculture industry employs over 9,000 individuals with revenue of more than \$152.5 million. This project will enhance opportunities for cut flower production in Georgia by addressing limiting problems in pest management. Biological and alternative tactics for management of the primary insect and mite pests will be developed and deployed using the gerbera system as a model. The driving factor in gerbera production is insecticide resistant leafminers. These can be controlled with parasitic wasps. This biological control is,

however, often disrupted by influxes of other common pests that require chemical control. We will develop simultaneous alternative methods compatible with biocontrol of the primary pest. This system will readily translate to other cut flower production systems.

The project is important and timely because with the advent of resistance to insecticides, there is usually one pest that “drives” the system. In gerbera production it is leafminers, for other crops it may be aphids, mites, whiteflies or thrips. Development of compatible alternative methods for the suite of potential pests of gerbera daisies can be directly transferred to other cut flowers in production making the project broadly relevant. This biologically-based approach to pest management will limit pesticide use and increase potential for cut flower production state-wide.

The results of the study have been shared with more than 100 growers and urban ag professionals via outreach activities at the annual Georgia Green Industry Association sponsored annual conference (Wintergreen) at the Gwinnett Center in Atlanta and at regional updates in Savannah. Cut flower growers also participated in the on-site components of the research.

This study has been summarized in impact statements provided to the public by the Dean. This searchable database can be found at: <http://www.caes.uga.edu/applications/impactstatements/>

There were numerous presentations made at state, regional and national meetings:

Georgia Entomological Society, Statesboro, GA. Host plant resistance in Gerbera daisies. Abraham, Cheri, Braman, Susan K. April 2012.

ESA National Meeting. Entomological Society of America, Reno, NV. Challenges in Greenhouse Gerbera IPM. Abraham, Cheri, Braman, Susan K., Oetting, Ronald D. November 2011.

ESA National Meeting. Entomological Society of America, Reno, NV. Integrating Chemical and Biological Control in Gerbera Production. Abraham, Cheri, Braman, Susan K., Oetting, Ronald D. November 2011.

Southeastern Branch Entomological Society of America. Entomological Society of America, San Juan Puerto Rico. Integration of chemical and biological control in Gerbera production. Abraham, Cheri, Braman, Susan K., Oetting, Ronald D. March 20, 2011.

Meeting of the Southeastern and Southwestern Branches of the Entomological Society of America. Southeastern Branch of the Entomological Society of America, Little Rock, Arkansas. Host. Plant resistance against leafminers (*Liriomyza trifolii*) in gerbera daisies. Abraham, Cheri, Braman, Susan K., Oetting, Ronald D. March 2012.

Georgia Entomological Society Annual Meeting. Georgia Entomological Society, Cordele, GA. IPM in Gerbera Production. Abraham, Cheri, Braman, Susan K., Oetting, Ronald D. April 2011.

GES. Georgia Entomological Society, McCormick, SC. Integrating Miticides in Greenhouse Gerbera Management. Braman, Susan K., Oetting, Ronald D., Abraham, Cheri. October 2010.

60th Annual Meeting. Entomological Society of America, Knoxville, TN. A Case Study: is Biologically Based IPM a Possibility in Greenhouse Gerberas? Abraham, C., Braman, Susan K., Oetting, R. November 2012.

Insect Identification, Georgia Green Industry Association Annual WinterGreen Conference, Atlanta, GA.  
January 27, 2010  
Participants: 36  
Mode of Delivery: Face to Face

New Pest Problems and Solutions, Georgia Green Industry Association, Atlanta, GA.  
January 27, 2011  
Participants: 130; Total CEUs: 2; Total Contact Hours: 130  
Instructor % Responsibility: 50%  
New Course Prep: Yes  
Mode of Delivery: Face to Face

## 5. **Lessons Learned**

In this Phase II project, pesticides compatible with Biological control were identified in the laboratory and validated under greenhouse conditions.

## 6. **Contact Person**

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## 7. **Additional Information**

Publications are in development or review.



**Integrating Chemical and Biological  
Control in Gerbera Production**

Cheri M. Abraham, S. Kristine Braman  
& Ronald D. Oetting  
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## **17. University of Georgia – Production Potential and Nutraceutical Content of Georgia Pomegranates – Final Performance Report**

### **Project Summary**

The newly founded Georgia Pomegranate Association (GPA), comprised primarily of blueberry growers wishing to diversify their crop in order to mitigate fluctuations in price and season, are actively promoting the production of pomegranate as an alternative high-value crop to compliment current blueberry production. However, one of the most important facts to know is which cultivar is the best one to plant.

In order to determine which cultivars are the most suitable for production in Georgia, a harvest and post-harvest quality assessment was performed on fruit obtained from established orchards in the state. Furthermore, a new orchard was established in Tifton, Georgia, to test new cultivars (to Georgia) acquired from germplasm sources from around the world. Using the fruit grown, numerous studies were performed evaluating post-harvest quality, phytonutrient content, potential for juice processing, and identification of fruit pathogens.

The aril juice from fifteen pomegranate cultivars grown in Georgia were analyzed for juice yield based on fresh weight (FW) and physico-chemical properties using blender and mechanical press extraction. Blender had a significantly higher ( $p \leq 0.05$ ) juice yield (42.04% FW) compared to mechanical press (38.05% FW). Total phenolics and antioxidant capacity was determined by Folin-Ciocalteu method and ferric reducing antioxidant power (FRAP), Trolox equivalent antioxidant capacity (TEAC), and oxygen radical absorbance capacity (ORAC) assays, respectively. Total monomeric anthocyanins were determined by pH differential method and RP-HPLC. The major anthocyanin was delphinidin 3-glucoside. High negative and significant ( $p \leq 0.05$ ) correlations were found between pH and titratable acidity (TA). The total soluble solids content (TSS) averaged 15.59 in blender and 14.94 °Brix in mechanical press. Chemical analysis of juice showed significant differences ( $p \leq 0.05$ ) among cultivars and extraction methods. Overall, blender was more efficient than mechanical press juice extraction.

### **Project Approach**

Fruits from each cultivar were divided into equal portions for juice extraction with either an Oster® blender (Oster, Fort Lauderdale, FL) or hand-operated juice extractor/mechanical press (Strite-Anderson Mfg. Co., Minneapolis, MN). The juice was obtained by pressurization of the arils. In the blender, the white membrane and the arils were juiced while in the juice extractor, it was only the aril juice as shown in **Figure 1**.

The pH and soluble solids content of the juice were measured immediately after extraction using a pH meter (IQ240, IQ Scientific Instruments, Loveland, CO) and a digital refractometer (300034, SPER Scientific, Scottsdale, AZ), respectively. Maturity index (TSS:TA) was calculated based on the classification made by Martinez et al. (2006). The color of the aril juice was measured using a colorimeter (Chroma Meter CR-301, Minolta, Ramsey, NJ) (Solomon et al., 2006). The titratable acidity of the juice was measured by standard AOAC official method (1984). Formol number was measured according to Anonymous (1984).

Total polyphenols were determined according to the Folin-Ciocalteu reagent method (Singleton & Rossi, 1965). The total anthocyanin content was estimated by the pH-differential (AOAC method 2005.02) method. Antioxidant capacity was evaluated by three methods: FRAP, TEAC, and ORAC. The FRAP assay was performed according to the method of Benzie & Strain (1996) with minor modifications. The TEAC assay was performed based on the method of Lee et al. (2003) with slight modifications. ORAC assay was carried out based on the method of Prior et al. (2003). The individual anthocyanins were identified using HPLC with UV-vis detector and quantified using authentic, external standards. All samples were analyzed in triplicate, and the results were expressed as average  $\pm$  standard deviation. All statistical analyses were conducted using one-way ANOVA and Duncan's multiple-range test was used to determine statistically significant differences of variables at  $p \leq 0.05$  (SAS 8.2, SAS Inst., Inc., 1999).

## **Goals**

Specific goals for 2010 included:

- 1) Determine cultivars with the highest juice yield
- 2) Determine individual anthocyanin levels in cultivars
- 3) Postharvest quality of the fruit
- 4) Provide the GPA with a list of cultivars
- 5) Attend and make presentations on findings at GFVG conference and GPA meetings
- 6) Publish manuscript and/or extension bulletins on Georgia pomegranates
- 7) Organize a pomegranate session at GFVG conference

## **Outcomes Achieved**

On average, the blender gave more juice yield (42.04% FW) compared to the mechanical press (38.05% FW). Cultivar Thompson gave the highest juice yield (51.16%) with blender, and cultivar King (45.29%) with mechanical press, both based on fresh weight (FW) of the fruits. The TSS levels in juice ranged from 13.80 - 16.57 °Brix. Cultivar Rose had the highest TSS content in blender (16.57 °Brix) and cultivar Kaj-acik-anor in mechanical press (15.83 °Brix). This shows that the fruits were at a fully ripe stage. The "taste" of the juice is generally defined by the ratio of TSS:TA. The TA values varied from 0.13-2.97% citric acid. Cultivar Haku-botan had a very low TSS:TA ratio in blender (13.83:2.97) and mechanical press (13.80:2.56), indicating that it might be a sour cultivar. This was accompanied by the low pH value of the cultivar in blender (2.66) and mechanical press (2.50) extractions. With increase in maturity, the pH value increased with a maximum of 4.08 for cultivar Fleshman, in blender extracted juice. The pH values were in the range of 2.50 - 4.08. Formol number was between 0.60-1.40 mL 0.1N NaOH/100 mL. The maturity index (TSS:TA) values showed wide ranges among the cultivars. Based on these values, cultivars Don Sumner South Tree, Don Sumner North Tree, King, Thompson, Fleshman and Pink can be classified as sweet cultivars; Kaj-acik-anor, Rose, Nikitski ranni, Salavatski and Cranberry as sour-sweet cultivars; and, Crab, Entek Habi Saveh, Afganski and Haku-botan as sour cultivars. The most popular, cultivar Wonderful had maturity index values varying from 11 – 16 and is considered to be sour-sweet. The physico-chemical characteristics of the juice indicate a wide range of genetic diversity among the cultivars grown in Georgia.

The total polyphenolic content varied between 27.25 - 84.94 mg GAE/100 g FW. In both blender and mechanical press extracted juice, the highest significant ( $p \leq 0.05$ ) total phenolic content was found in cultivar Entek Habi Saveh (84.94, 77.06 mg GAE/100 g FW), respectively. Cultivar Haku-botan had a very low total phenolic content in both blender (28.98 mg GAE/100 g FW) and mechanical press (27.25 mg GAE/100 g FW) extracted juice. Cultivar Cranberry (42.30; 40.88  $\mu$ M TE/g FW) had the highest significant ( $p \leq 0.05$ ) FRAP value in blender and mechanical press, respectively. TEAC values were higher for cultivar Thompson (8.42  $\mu$ M TE/g FW) for blender and cultivar Don Sumner North Tree (7.94  $\mu$ M TE/g FW) for mechanical press

extraction. For ORAC assay, cultivar Thompson showed high antioxidant capacity (1721.60  $\mu\text{M TE/g FW}$ ) for blender and cultivar Cranberry (1426.99  $\mu\text{M TE/g FW}$ ) for mechanical press.

The total monomeric anthocyanin levels ranged between 0.40 - 41.97 mg cyanidin-3-glucoside equivalents/100 g FW. By visual appearance, cultivar Kaj-acik-anor produced dark red color juice, with a high total anthocyanin level for blender (41.97 mg cyanidin-3-glucoside equivalents/100 g FW) and mechanical press (31.30 mg cyanidin-3-glucoside equivalents/100g FW) extractions. Six kinds of anthocyanins were separated from the aril juice by RP-HPLC: cyanidin 3-glucoside (Cya3), cyanidin 3,5-diglucoside (Cy3,5), delphinidin 3-glucoside (Dp3), delphinidin 3,5-diglucoside (Dp3,5), pelargonidin 3-glucoside (Pg3), and pelargonidin 3,5-diglucoside (Pg3,5). Delphinidin 3-glucoside was the major anthocyanin found in both blender and mechanical press. Cultivars Don Sumner North Tree and Haku-botan had the highest  $L^*$  value indicating that they have a lighter color. The  $a^*$  and  $b^*$  values were higher in cultivar Kaj-acik-anor showing that the red and yellow color components, respectively, were predominant in the aril juice. The purity or saturation of the color is defined by chroma value  $C^*$ . Cultivar Kaj-acik-anor had the highest  $C^*$  value for blender and mechanical press showing the presence of intense red color. The hue angle  $h^\circ$  denotes the subtle distinction or variation in color. Cultivar Haku-botan had the highest value for both blender and mechanical press indicating a predominant yellow color.

The project identified 3-5 cultivars that performed well in many aspects of tree productivity, fruit quality, storage potential, and consumer visual and taste appeal. Nikitski ranni and Cranberry performed consistently, with good productivity, color, taste, and excellent antioxidant values. This information was relayed to growers via the GPA meetings and through other forms of oral/written contact. Presentations of the results through extension publications are, and will be made available. The first presentation published, *Pomegranate Production*, is attached to the end of this full state report.

The first Southeast Regional Pomegranate Workshop took place over two days last September 2011. Participants from South Carolina and Florida, as well as numerous growers and researchers from Georgia were in attendance. The program consisted of orchard tours, pomegranate taste tests, and discussions with regard to joint regional research initiatives.

Because of reduction in staff, i.e., the loss of the project coordinator, there was not a presentation made at the Southeastern Fruit & Vegetable Conference held last month (January 5-8, 2012).

The Georgia Pomegranate Association has not held a meeting since the two-day workshop in September 2011.

### **Beneficiaries and How They Benefited**

The Georgia Pomegranate Association will benefit from the list of potential pomegranate varieties with high quality juice yield suitable for growth in Georgia. This study shows statistically significant differences among the different pomegranate cultivars grown in Georgia in terms of yield, total phenolic content, antioxidant capacity and anthocyanin levels of the juice. When comparing the two methods used for juice extraction, the blender consistently had significantly higher yield, antioxidant capacity, total phenolic content and total monomeric anthocyanins than mechanical press (Table 1). This may be due to the presence of seeds, pith and carpellary membrane which contributes to the antioxidant and phenolic content. Cultivar, Thompson with red to pink arils may be suitable for both fresh consumption and juice production based on yield, total polyphenols, antioxidant capacity and maturity index. Cultivar Kaj-acik-anor, a sour cultivar with dark red color arils and high anthocyanin content may be used for production of juice with good health benefits. The results of this study provide information about important physico-chemical properties of the juice which may enable pomegranate growers in Georgia to select suitable cultivars to propagate for commercial cultivation and for the juice processing industry.

### **Lessons Learned**

Stability of individual anthocyanins over time needs to be studied, since degradation of anthocyanins will result in loss of color in the juice. The physico-chemical characteristics of the pomegranate cultivars showed distinct differences. The ratio of total soluble sugars and titratable acidity provide valuable information on the maturity of the fruit.

### **Contact person for the project**

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### **Additional Information**



## Pomegranate Production

*Dan MacLean, Horticulture; Karina Martino, Food Science and Technology;  
Harald Scherm, Plant Pathology; and Dan Horton, Entomology*

Pomegranates have been grown as a common backyard crop for decades in the South. In recent years, there has been an increased interest in the commercial production of the fruit in Georgia and surrounding regions. This production increase is largely in response to increased demand for the fruit by the consumer. Global production has increased substantially in the past decade, and pomegranate is being consumed not only as a fresh fruit, but also as juice or as a freshly prepared product. The fruit is also being utilized in numerous consumer products, including tea and juice blends, nut mixes and countless other food and non-food stuffs.

This publication describes current knowledge specific for the commercial and backyard growing of pomegranate in Georgia, as well as general production practices common in other pomegranate-producing regions. However, it should be noted that limited local knowledge is available, and the information contained in this publication is based largely on the fruit produced at the UGA Ponder Farm, an orchard that was planted in 1991-1994.

### Introduction

The pomegranate (*Punica granatum*) is a naturally dense, deciduous, bushy, multi-stemmed shrub that typically grows to heights of 10 to 12 feet and bears highly colored fruit with many juicy seeds inside. In some regions, pomegranates are trained into small trees with a single trunk. The branches tend to be slender and thorny, while the leaves are glossy and dark green. The colorful orange-red flowers appear in the spring and summer and are either bell-shaped (female) or vase-shaped (hermaph-

roditic), with the latter type being sterile. The edible portion of the fruit, called an aril, is comprised of hundreds of seeds surrounded by juicy pigments, each contained within a seed coat (Figure 1). Seeds are either soft or hard, depending on the cultivar. The juice within the aril varies from light pink to dark red, but can also appear yellow or clear in some varieties. The juice ranges from very acidic to very sweet in taste. The rind is generally smooth but leathery, and can be yellow, orange or red in color.



Figure 1. Arils of pomegranate cultivar 'Kaj-acik-anor.' Arils are comprised of the outer shell, seed and, as seen in this cultivar, a brightly pigmented red juice.

## History

In old Latin, the name *Malum punicum* literally translates to “Apple of Grain” or multi-grain, in reference to the multiple seeds in the fruit. However, the current Latin name *Punica granatum* L. is derived from “Pomuni granatum,” a name traced back to the middle ages, which translates to “seeded apple.” Domestication of the pomegranate is believed to have begun in Central Asia and Persia nearly 4,000 years ago, and then spread east and west through hot, arid regions of India, Asia Minor and the Mediterranean coast. Spanish settlers first introduced the fruit to North America, including missions on the Georgia coast, in the 16th century. Pomegranate has been a reasonably common backyard or dooryard plant in south Georgia for centuries. The plants are long-lived and bear fruit for decades. The origin of the Georgia plants is largely unknown; however, research efforts are being made to locate, identify and characterize these local trees.

There is some debate as to the origin of the ‘Wonderful’ cultivar. One version of the story suggests that in 1896, the ‘Wonderful’ cultivar was discovered in Florida and brought to California (where it was subsequently commercialized) by a Mr. Birs. Another version suggests that a shipment of cuttings and/or seedlings was shipped to Porterfield, Calif., where the ‘Wonderful’ cultivar was discovered amongst the plants. Although it has become the major cultivar in California, it performs very poorly in Georgia.

## Climate

Most pomegranate cultivars are hardy down to 12°F, with the hardier types surviving without damage down to 7°F. Anecdotal evidence suggests that hard-seeded varieties are more cold-hardy than the soft-seeded types. The majority of pomegranate varieties do not require winter chill hours, with the exception of a few cold-hardy cultivars. Consequently, wood is always susceptible to injury. All varieties will benefit from a rest period or “dormancy,” though assigning a minimum chill hour requirement is not currently possible.

The tree is most resistant to the cold in the winter months, and tends to be more susceptible to frost damage prior to reaching full “dormancy” in the fall and at bud break in the spring. It is during these periods that the bark is most susceptible to damage from frost, which usually occurs first on the south side of the tree closest to the ground. If frost damage is a problem, a possible solution is to paint the bark white with flat latex paint in order to reduce fluctuations between day and nighttime temperature extremes.

Pomegranates are extremely heat tolerant, and perform best when temperatures are above 85°F for at least 120 days a year. The trees are also drought-tolerant; however, supplemental irrigation is necessary during tree establishment and is critical for commercial fruit production. Without irrigation during prolonged periods of drought, fruit production will be lost, and substantial injury to young trees is likely.

## Soil and Site Selection

Pomegranates perform best on deep loamy soils, but will still grow quite well in sandy and clay soils. Trees are tolerant of moderately acid to slightly alkaline soils and grow best in a soil pH range of 5.5 to 7.2. Though pomegranates can tolerate short periods of standing water, they prefer well-drained soils. Extended periods of excessive moisture will harm the trees. Pomegranates are also moderately tolerant to salts and can withstand irrigation with water containing 2,000 to 2,500 ppm salt.

Aside from soil type and drainage, site selection should also take into consideration sun exposure and air circulation. Pomegranates require at least six hours of direct sunlight a day in order to ensure good fruit color and productivity. Aligning the orchard rows north-south will maximize sun exposure. However, soil drainage is more important than row orientation. In most of south Georgia, pomegranates should be planted on a raised bed at least 4 feet wide and 6 to 12 inches in height. A water furrow can be added to each aisle if additional drainage is needed.

Though pomegranates are susceptible to sunscald, only a small percentage of fruit will normally be damaged in a given season. Sunscald appears as a change in blush of the fruit, and will appear on the sun-exposed side of the fruit. Sunburn is a progression of sunscald, and appears as either severely darkened skin or as dry, necrotic and cracked skin in severe cases. Kaolin can be used to reduce sunscald, which, if left unmanaged, may lead to sunburn. If the fruit will be marketed fresh, the kaolin spray must be washed off after harvest since it appears as pesticide residue. High incidence of sunburn can contribute to weakened rind and subsequent cracking (Figure 2).



Figure 2. Example of sunscald (top) and sunburn (bottom).

Air circulation is important, especially in the spring during bloom. Flowers may not set or will abort if conditions are too humid. Thus, open areas free from shade with a gentle slope

to promote natural air drainage are encouraged.

Pomegranates in other production regions are reportedly susceptible to root-knot nematode. As a precaution, new orchards in Georgia should not be established in areas with known root-knot nematode infestations.

## Propagation

Pomegranates can be propagated from softwood or hardwood cuttings. Hardwood cuttings are the preferred means of propagation, but softwood cuttings collected in early fall can be used with varying degrees of success. A tree from a hardwood cutting will bear fruit in year two after planting, while it will take at least three years from seed. Trees will reach maturity in five to seven years, and can live up to 200 years.

For hardwood cuttings, remove approximately 10 inches of one-year wood in late fall or early winter. Cuttings should be approximately  $\frac{3}{4}$  to  $\frac{1}{2}$  inch in diameter, or about the same width as a pencil. Suckers from the base of the plant or from the interior of the canopy often make some of the best wood for cuttings. Cuttings can be propagated either in a pot containing a modified soil or soilless media or directly in ground, spaced about a foot apart in a nursery row. Stick the cuttings, leaving only 2 to 3 inches of the top of the cutting exposed. It is preferable to have at least three nodes under the surface. Rooting hormones, mist bed and root zone heating (75°F) will increase the success rate but are not required. Allow the cuttings to grow for the season. The following spring, transplant the cuttings bare root into the orchard at proper spacing.

One suggested protocol for propagating pomegranates is as follows:

1. Stick in February, after "dormancy" period is complete, in 1:1 vermiculite:perlite.
2. After 1 inch of root growth, transplant into a tall pot with 1:1:1 peat:bark:perlite.
3. After establishment, transfer to tall 1-gallon pots in soil, and support with bamboo.

## Orchard Establishment

Rooted hardwood cuttings are planted bare root in late winter or early spring. Pomegranates can be placed directly in-ground or on raised beds. The latter is recommended, especially if a high water table or poor drainage is suspected. An herbicide, such as Surflan A.S., should be used prior to transplanting to remove competition from other plant species. Pre-emergent herbicides such as Goal can be applied during dormancy. Applications of Touchdown HiTech (glyphosate) in row middles are performed throughout the season. Basagran is also a registered herbicide for nonbearing trees, and can be used in rotation with other labeled herbicides. Consult label for rates and application restrictions, and refer to the current edition of the Georgia Pest Management Handbook for the most current information.

Mulch can be used in a manner similar to blueberry production to prevent weed invasion and to preserve soil moisture content around the young plant.

Optimal tree spacing has yet to be determined for production in the Southeast. Traditional spacing for an orchard is 18' x 18' (134 trees/acre). This density permits adequate sunlight penetration for fruit color, adequate airflow between trees and efficient movement of people during harvest. Tighter densities, such as 16' x 18' and 14' x 18', have been used with some degree of success in regions other than Georgia. However, these densities, especially the latter, should be approached with caution as they will require diligent pruning and canopy architecture training in order to not have an adverse effect on yield once the orchard reaches maturity. Some local growers are attempting tighter densities of 10' x 15' (290 trees/acre). Since it will not be known if this density is manageable until the orchard matures, this is not a currently recommended strategy.

The first harvest is in year three, but these fruit will tend to be small and late-maturing. The focus should be on tree growth as opposed

to fruit production in these early years, and it is not uncommon for the majority of fruit to drop prematurely. Full commercial production begins occurring in years five or six.

## Irrigation

Though pomegranates are very drought tolerant, ensuring adequate soil moisture will result in a substantial improvement in plant vigor and fruit yield. Furthermore, providing adequate water throughout drought periods will help minimize the amount of fruit splitting when the rain returns. Drip irrigation is the preferred method. Overhead irrigation is not advisable as it will increase the spread of field pathogens and may also result in reduced fruit set because the flowers are highly sensitive to humidity and moisture. Excessive soil moisture in the summer can lead to an abundance of vegetative growth, but the fruit produced will tend to be softer, resulting in poor postharvest quality. Avoid excessive irrigation in the fall as it may contribute to fruit splitting. This splitting can lead to increased rates of infection from field-borne diseases, which will eventually develop during storage.

## Fertilization

Soil pH should be adjusted to 6.5 with dolomitic limestone before planting. Phosphorus should also be incorporated in the soil by adding 150 pounds per acre of triple superphosphate if the phosphorus level is less than 20 pounds per acre.

If you are planting small plants, a small amount of non-burning, controlled-release nursery fertilizer is recommended to help with establishment. If you are planting a 1 gallon-size plant, a suggested rate of fertilization is 1 ounce of 10-10-10 per foot of bush height three times a year (early spring, late spring and summer) applied evenly in a circle about 18 inches in diameter with the plant in the center. Continue to increase the diameter of the circle and the rate as the plants grow, up to a maximum of 8 ounces per application when the plants are 8 feet tall. Under conditions of heavy rainfall or very sandy soil, additional



**Figure 3.** Examples of multi-trunk (left), single-trunk (center) and triple-trunk (right) tree training strategies.

fertilizer should be applied. Nitrogen rates in California can be up to 100 pounds per acre per year on mature trees. Phosphorus and potassium should be applied based on soil and leaf analysis.

It is very important to note that excessive nitrogen in the late summer to early fall will have a detrimental impact on fruit color and size, and may also increase the susceptibility of the tree to early chilling temperatures. As for other macronutrients, phosphorus and potassium need only be applied if soil tests or leaf analysis indicate a deficiency. One of the few common deficiencies found in pomegranate is zinc, which appears as unusual yellowing of the leaves. If required, a foliar zinc application in the spring after fruit set is recommended.

### Pruning and Training

There are two common approaches for training a pomegranate plant: single or multi-trunked. The multi-trunked form is probably best in Georgia. The single-trunk plant has a short (12-18") trunk with five to six major branches diverging to form a vase-shaped structure. The multi-trunk plant has three to six of the strong branches developed directly from the ground.

The single-trunk approach has the advantages of easier orchard floor maintenance and re-

duced costs associated with pruning suckers. Though this approach is popular in California, it has not been readily adopted by other pomegranate-producing regions of the world.

One major advantage of the multi-trunk approach is that if a freeze event occurs and damages a portion of branches, you can simply remove them and train a vigorous sucker to take their place without a significant loss in production. In the single-trunk system, you would have to replace the entire tree.

The single-trunk system requires more labor while establishing the canopy architecture and placing supporting wires, but requires less labor after the orchard is established relative to the perpetual removal of suckers required in the multi-trunk system. However, the multi-trunk system will not require as many supporting wires.

For single-trunk production, remove all but the strongest sucker and select branches off this sucker. For a multi-trunk system, select five or six vigorous suckers and allow them to grow, or, as a compromise between the two approaches, use a triple-trunk system (Figure 3).

Pomegranates require pruning each year, and unneeded growth and suckers should be re-



**Figure 3.** Examples of multi-trunk (left), single-trunk (center) and triple-trunk (right) tree training strategies.



**Figure 3.** Examples of multi-trunk (left), single-trunk (center) and triple-trunk (right) tree training strategies.

moved regularly. Short fruiting spurs appear primarily on two- or three-year-old wood, and are found growing mostly on the outer perimeter of the canopy. Light annual pruning encourages growth of new fruit spurs, while more aggressive pruning will significantly impact yield. Therefore, pruning must be performed on an annual or semi-annual basis in order to minimize the onerous task of aggressive pruning, and to reduce the likelihood of removing excessive amounts of fruit-bearing (older) wood.

Major pruning should take place during the winter months prior to bud break, with minor pruning for sucker removal in mid-summer. Major pruning is where the tree architecture is established. Efforts should be made to maintain an open, vase-shaped tree with enough lateral branches to support the tree (including the weight of the fruit) without excessively inhibiting airflow, sunlight penetration or excessive fruit rub on windy days.

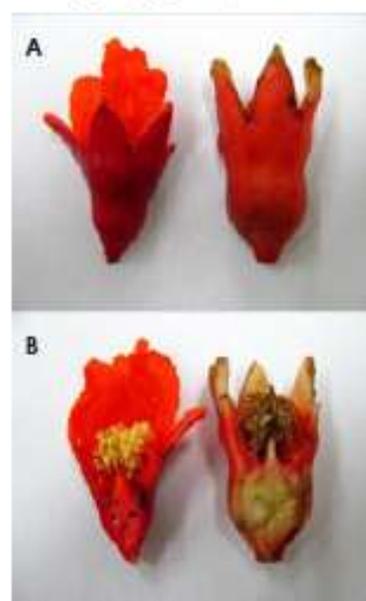
The weight of the fruit on a branch can be substantial. Support these branches to ensure that fruit does not come into contact with the orchard floor, remains clear of farm equipment and is away from ground-level critters. Injury from wind, called limb rub or wind scars, are wounds that can have a major impact on quality for fruit intended for the fresh market, and can lead to entry points for pathogens. Trees can be maintained at a height that minimizes ladder work by the harvest crews (approximately 9 feet), though trees will naturally grow to 10-12 feet. After year five, ground suckers may be controlled with careful use of herbicides.

### Pollination

Pomegranates are self-fruitful. The primary pollination vectors are insects and hummingbirds. Bloom begins in April and continues through to June, either in a continuous manner or in three to four flushes (variety dependent). It is not unusual for pomegranate to produce flowers well into fall; however, the majority of

the blooms appear early in the spring and will result in the largest fruit at maturity.

There are two types of blooms: hermaphroditic and functionally male. The hermaphroditic fruit-bearing flowers can be identified by their fuller, more rounded base, which appears somewhat peanut or bell-shaped. The male non-fruit-bearing flowers will be more narrow and vase-shaped (Figure 4).



**Figure 4.** The exterior (A) and interior (B), of the vase-shaped male (left flower) and peanut-shaped hermaphroditic (right flower) pomegranate.

### Pathogens

There is limited information about the disease pressures specific to pomegranates produced in Georgia. The information that is available so far has been obtained from harvested fruit, and no information is currently available about the economically important pathogens that may be present on pomegranate leaves and in the orchard environment. In general, the fruit and trees are considered reasonably disease-tolerant. Currently, there are no registered products for the control of diseases.



Figure 5. Example of *Cercospora punicae* (left) and *Botryosphaeria* spp (right). Photographs courtesy of Dr. Harald Scherm and Lucky Mehra, UGA Department of Plant Pathology.

With respect to the known pathogens from Georgia, fruit harvested from the Ponder Farm Pomegranate Orchard displayed symptoms caused by the infection of *Cercospora punicae* and *Botryosphaeria* spp. (Figure 5). Other organisms that were also present on the fruit (but did not cause any symptoms) included: *Aspergillus*, *Cladosporium*, *Colletotrichum*, *Epicoccum*, *Penicillium*, *Pestalotia* and *Phomopsis* spp. Further surveys and studies on the pomegranate diseases in Georgia are needed. Pomegranate growers are encouraged to report their experiences to their local county agent or Extension offices.

One of the most interesting findings was that *Alternaria* spp. was not present. This is a major problem in some other production areas (California). *Alternaria* spp. usually enters the fruit during bloom/fruit set. As the fruit develops, the fungus spreads through the interior of the fruit, while leaving the exterior untouched. This type of disease is often called "black heart" or "heart rot," and there is no known method of control. There is some evidence suggesting that occurrence is greater when moisture is present during bloom. Even though *Alternaria* spp. was not present at the Ponder Farm orchard that does not mean that

it is not present in other production regions in the state.

Other U.S. production areas, including Florida, have found an unidentified fungal disease that can affect both fruit and leaf tissues. The leaf symptoms include small spots or angular regions that are dark red-brown in color and about ¼-inch in diameter. Fruit symptoms appear as dark brown spots. Presence of the disease causes premature leaf and fruit drop. The described disease may be *Cercospora punicae*, or may be some other unknown disease. It was treated with a copper fungicide in late spring and early summer with reasonable success.

## Pests

There is no information about the pest pressures specific to pomegranates produced in Georgia. The only products available for pest management of pomegranate include: Lannate, Admire and Dipel. There are opportunities for using chemicals that are considered reduced-risk or that carry tolerance-exempt status. These products can be used on any crop, and include: B.t. sprays, soaps, sulphur dusting, plant oils and omnivorous leafroller pheromone mating disruption.

So far, there have been few insect pest problems on Georgia pomegranate farms. However, other U.S. production areas have problems with the following pests: Flat mite (*Brevipalpus lewisi*), omnivorous leafroller (*Platynola stultana*), root-knot nematode, mealybug, melon aphid, thrips, whitefly, scale (citricola, black and California red) and katydid. However, very few of these have caused any significant damage, and seldom required control. If mites become an issue, a sulphur dusting in June followed by a second application in July (if necessary) can offer some protection. White aphids in these other production regions are routinely controlled using soap, but can also be controlled with an application of Lannate. The use of dormant oil sprays (3 percent) in winter has been effective against scale. However, more research is required to first identify and then determine an appropriate recommendation for the control of Georgia pomegranate pests.

### Harvest Maturity

Pomegranates in general do not have a synchronized single spring bloom and can have shoot flushes that bear flowers throughout the warmer parts of the year. Early cultivars will begin to ripen near the end of August, and will continue through to October or early November for the late-maturing cultivars. Except for intensive production where once-over harvesting is occasionally practiced, plan on harvesting two to four times per season.

Harvest maturity is determined by sugar and acid contents, sugar:acid ratio and the color development of the fruit. With experience, proper harvest maturity can also be determined by tapping the fruit and listening for a metallic “ting” sound. In general, for ‘Wonderful,’ the acids should be lower than 1.85 percent, soluble sugar content greater than 16 to 17 percent and the sugar:acid ratio greater than 18.5. A Munsell color chart has been used for determining the color score of the fruit rind. However, rind color values will vary with season and should only be used in combination with other maturity tests. Harvest maturity indices for cultivars other than ‘Wonderful’ are not cur-

rently available, but it is known that they will differ significantly from the benchmark values established for this cultivar.

Compared to other similar crops, pomegranates are easy to harvest and require minimal ladder work (assuming proper pruning and training of the tree). Fruit are harvested by clipping them with shears (Figure 6). Cut as close to the fruit as possible to prevent a sharp point of wood from piercing and rubbing against other fruit in the bin. Fruit are placed either directly into bins located in the orchard, or into shoulder harness baskets (identical to those used in the apple industry) while working around the tree. Either way, fruit should be handled with care in order to minimize scuffing or cracking (a strong bump may cause the fruit to split open).



Figure 6. (Top) Use clipping shears and cut as close to the fruit base as possible. (Bottom) ‘Nikitski ranni’ near harvest at Ponder Farm, Tifton, Ga.

## Postharvest Handling and Storage

Postharvest handling of pomegranate is similar to that of apple. After harvest, fruit are transported to a sorting facility in a timely manner. It is not necessary to pre-cool fruit after harvest, but fruit will benefit from being placed into cold storage as soon as possible after harvest. Fruit destined for the fresh market should be washed with chlorine, rinsed with water and sorted by culls, cracks, defects, color, size and weight. Fruit should also be treated with a postharvest fungicide such as Scholar (Syngenta), especially if they will be placed into longer-term cold storage. A storage wax can also be applied to promote the visual quality of the fruit and increase its storage life by reducing moisture loss. Fruit destined for the fresh market can either be placed in storage bins (for later packaging) or packaged immediately into appropriate cartons for the desired market (e.g., cardboard bin for 28, 25, 22 or 5 pounds). Pomegranates are sorted into two grades, 1 or 2.

Fruit can be stored up to six weeks in open-air storage or five months using controlled atmosphere storage (CA). CA is also useful for controlling the incidence of storage scald (the browning of the red pigments in the rind of the fruit). For high quality fruit, the lowest temperature used should be 41°F for short-term storage (less than three weeks); 45°F is more appropriate for longer-term storage. For fruit with known disease pressures, it is advisable to store for less than three weeks at a reduced temperature of 32-34°F. Low temperature discourages pathogen growth and spread, but will also cause chilling injury in fruit stored longer than three weeks. This will ultimately result in increased pathogenicity during and after removal from low temperature storage.

Chilling injury is a time by temperature interaction. A relatively short period at a low temperature may not cause damage, but an extended period at that same temperature will. It is important to select a temperature appropriate for the anticipated storage period.

Chilling injury appears as the browning of the white interocular membrane and arils. Arils will lose their desirable pigment and will also soften, resulting in higher levels of pathogenicity (Figure 7).



Figure 7. Chilling injury in 'Don Summer South Tree' after eight weeks of storage in air at 5°C (41°F).

## Peeling a Pomegranate

Pomegranates are often cited as being difficult to peel and the juice can readily stain clothing. The following describes a technique for minimizing juice stains and increasing the ease of aril removal.

When preparing the fruit in a kitchen, first slice off the calyx of the fruit with a knife. Carefully score the exposed surface into quarters. Fill a bucket or other container with water, and then submerge the fruit. With the fruit submerged, pry open the fruit along the score lines and remove the arils with a rolling action under your thumb. The arils will sink to the bottom of the container, while all the pulp, peel and damaged seeds will float to the top. Once you have finished, remove the floating debris and pour the water through a suitable strain. With practice, a pomegranate can be peeled in minutes. Commercial scale equipment for aril removal is available from a select number of manufacturers based out of Israel and India.

## Juicing a Pomegranate

Pomegranate juice has increased in popularity because of its nutritional value and taste. Juice is a more convenient way of ingesting the beneficial health compounds that are present in the fruit. However, different pomegranate cultivars will have varying levels of juice yield, color and antioxidant content. Furthermore, the optimum processing conditions that affect these quality aspects might vary depending on the cultivar.

Home juice production can be simply accomplished by separating the arils (as described above) and then pressing the arils in cheesecloth, or using an electric blender followed by straining to remove the seeds. Laboratory scale juice extraction can involve numerous steps, including: opening the fruit, separating the arils and pressing to extract the juice. Numerous other optional steps then follow to strain, filter, purify and pasteurize the juice prior to bottling. In all cases, temperature control is very important. For home juice production, juice should be consumed fresh or stored in the refrigerator for only a short period of time.

Before choosing a variety for juicing, several different quality aspects need to be considered. Some cultivars may have the desirable color and antioxidant content, but may not have the best yield. For example, 13 Georgia-grown pomegranate cultivars were evaluated for juice yield and antioxidant content. Juice yield ranged from 24 to 39 percent of fruit weight, while there was a two-fold range in antioxidants from the lowest to highest. Thus, it is desirable to conduct a small study to determine juice yield. This can be easily done with the weight of the whole fruit and the weight of the juice using the following formula:

$$\% \text{juice} = \frac{\text{Juice weight} \times 100}{\text{Whole fruit weight}}$$

To determine other quality aspects, such as color, antioxidant content, sugar and acid content, a private laboratory may be used.

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# Postharvest Quality of Georgia Grown Pomegranates

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## Introduction

Consumption of pomegranates has increased dramatically over the past decade, due in large part to the purported health benefits of the phytonutrients contained in the fruit. Growers in the SE are interested in planting, and acreage has increased substantially over the past 3 years. Production in the SE was briefly investigated when a planting of numerous varieties was initiated in mid-1980 and early-1990's at two Georgia sites (Byron and Ponder Farm research stations). These varieties were primarily selected based on chilling tolerance. However, there are no reports investigating the basic postharvest quality parameters, and suitability of locally produced pomegranates for fresh or process markets. Thus, the purpose of the present study was to evaluate the postharvest quality of the pomegranates available in Georgia.

## Objective

The objective of the current study was to evaluate the postharvest quality of Georgia grown pomegranates



Figure 1. Nikitki Ranni (R-19).

## Methods

Fruit from the Ponder Farm, Ty Ty, GA, were harvested on September 24<sup>th</sup> and October 8<sup>th</sup>, 2010, and evaluated either immediately for initial quality, or stored for 1-week at room temperature (70°F). In total, 20 varieties were evaluated for yield, exterior color, size, total soluble sugars, total titratable acids, taste, and juice color, using 3 repetitions of 3 fruit each (though not all trees had sufficient fruit for all tests). The incidence of injury, pathogenicity, or other physical disorders were also recorded. Exterior color was determined using 3 measurements per fruit (9 per repetition) using a Konica-Minolta CR-400 handheld colorimeter, while size was determined using digital calipers. Fruit arils were removed, and 50 g were crushed and filtered through 4 layers of cheesecloth. Using this juice, a 100 uL sample was used for determination of total soluble solids using a handheld refractometer, while a 1-mL sample was used for determination of juice color using a Beckman Coulter 510 spectrophotometer set at the Absorption maxima for the juice (512 nm). Finally, a 10-mL sample of juice was diluted with 40 mL of ddH<sub>2</sub>O, and titrated using 0.1 M NaOH in order to determine total titratable acid content (expressed as %).

## Results



Figure 2. Fruit and aril color of 20 cultivars harvested from UGA Ponder Farm in fall 2010. (Alphabetical from top left to right) 1) Algaraldi (R-26), 2) Cloud, 3) Combi Sweet, 4) Crab, 5) Cranberry, 6) Don Summer North, 7) Don Summer South, 8) Entek habi sawh (H-1), 9) Eve, 10) Fleischman, 11) Granada, 12) Kaj aski anor (R-4), 13) King, 14) Mehos (R-2), 15) Nikitki Ranni (R-19), 16) Pink, 17) Salavatsi (R-8), 18) Sweet, 19) Thomson, and 20) Utah Sweet.

Table 1. Yield (bushes) from UGA Ponder Farm (fall 2010), with Cranberry and Nikitki Ranni highlighted red (best overall).

Cultivar	lb/tree	Cultivar	lb/tree
Thomson	44.2	Salavatsi (R)	15.9
Cranberry	43.8	Crab	14.3
Don summer South	40.2	Cloud	12.6
Don summer North	33.6	Kaj aski anor (R)	10.0
Nikitki Ranni (R-19)	29.6	Sweet	9.1
Pink	26.9	Algaraldi (R)	6.5
King	25.9	Utah Sweet	6.2
Eve	22.3	Mehos (R)	5.0
Fleischman	20.9	Granada	4.1
Combi Sweet	17.5	Rose	3.5
Entek habi sawh (R)	16.1	Mae	1.3

Fig. 3A

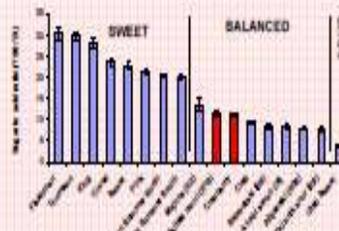


Fig. 3B

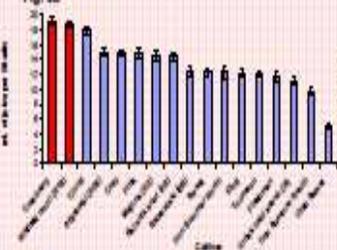


Fig. 3C

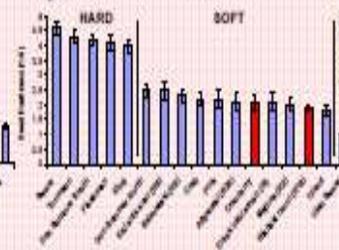


Figure 3A. Sugar to acid ratio, from sweet (left), balanced (middle), to sour (right). 3B. Volume of juice (mL) obtained from 50 arils. 3C. Seed hardness from hard (left) to soft (right).

## Discussion

Across all postharvest quality traits, two cultivars, Cranberry and Nikitki Ranni (R-19) performed the best. Though they had two of the greatest yields, it is not yet known what the full potential of these, or other cultivars are, as the Ponder Farm orchard is still being revitalized, thus total yield values should be approached with caution. These two cultivars have good external and internal color (figure 2). As seen in Figure 3A, they also have a balanced sugar to acid ratio, which has broader appeal than some very sweet, or very sour cultivars. They are the two highest juice yielding cultivars (based on amount of juice acquired from 50 arils), though this also needs to be approached with caution, as it may simply be an indication of fewer, larger arils. Also important, for the fresh market, the seeds from these two cultivars were considered to be soft, which results in fewer seeds becoming lodged in the teeth of consumers. However, for juice processing, a harder seeded cultivar may be more appropriate (ease of filtering and reduced contamination). Though data is not presented, these two cultivars also displayed below average susceptibility to *Cercospora* and *Botryosphaeria*, two recently identified pathogens. They also had very good average fruit size, low cracking, low sunscald, and scored well on informal tasting.

## Conclusions

1. Cranberry and Nikitki Ranni performed the best when taking into consideration all postharvest parameters used to evaluate the fruit. They had high amounts of nutraceuticals and displayed low susceptibility to surface defects and decay.
2. There is tremendous variation in color, taste, and juice potential amongst cultivars
3. Yield values must be approached with caution until an orchard at appropriate density, and properly managed is established.

## Acknowledgements

This research was funded by the USDA Specialty Crop Block Grant Program – Farm Bill (040924), the USDA-ISE program (039267), and supported by the Georgia Pomegranate Association.

## **18. University of Georgia – Develop efficient drying technologies and innovated value-added dried natural products from Rabbiteye Blueberries-Part II – Final Performance Report**

### **1. PROJECT SUMMARY**

The overall goal of the proposed project was to develop drying processes and appropriate products for Georgia Rabbiteye blueberries. Specific objectives were to: a) Evaluate different drying technologies; b) Examine the feasibility of converting existing unutilized tobacco curing barns into on-farm blueberry dryers; c) Evaluate the size (small vs. large) and form (fresh vs. frozen) of blueberries before drying on the drying characteristics and quality of dried blueberries; and d) Examine the potential of producing low calorie sweetened dried blueberries with a natural sweetener.

**Drying methods:** Several drying techniques were evaluated - Forced air dryer, impingement oven and a jet-zone fluidized bed dryer. Significant difference in the drying time for blueberries was observed among the different drying methods; drying is faster at 107C than 85C for all drying methods. Impingement drying is faster than forced air dryer and slower than Jet-zone fluidized bed dryer and overall quality of impingement dried blueberries was comparable with the control methods.

**Feasibility of Converting Tobacco Barns into Blueberry Driers:** The conclusive analysis is that it is not cost effective to convert/refurbish the existing tobacco barns into blueberry dryers. The reasons for this are: the fans and furnace were rusty and have not been used for an extensive period of time; the grates (drying racks) used for drying tobacco cannot be used in the existing conditions because they are made of iron/steel and badly rusted; also for drying food grade products, the surfaces have to be made of stainless steel; the flooring of the barns is not acceptable for drying food products, it has to be redone with poured concrete; the inside walls and the ceilings of drying chamber in the existing barns have foam blown insulation. The interior has to be gutted and reinsulated to meet sanitary requirements of using the drying chambers for drying food grade products (drying blueberries).

**Drying characteristics of blueberries as affected by size (small vs. large) and form (fresh vs. frozen):** Frozen berries dried much faster than the fresh berries. This effect was more pronounced with the larger size berries; fresh berries initially dried at a faster rate than the large size fresh berries; however, that difference became negligible after 3 hrs of drying; frozen large berries dried at a faster rate than frozen small berries.

**Evaluating low calorie sweeteners for enhancing sweetness of dried blueberries:** The commercially available product (dried, rehydrated and infused with high level of sucrose) received the highest scores. All of the other samples received a score greater than 5 (which refers to a neutral opinion such as “like slightly”). Additional studies may result in producing rehydrated acceptable berries using a natural low-calorie sweetener such as Nectresse and Stevia.

## **2. PROJECT APPROACH**

Blueberry production is a \$60 million industry in Georgia. The major variety of blueberry grown in Georgia is Rabbiteye and it accounts for more than 80% of the overall production. With expanding production acreage and yield, Georgia blueberry growers are under extreme pressure to find additional applications/usages or market to avoid pushing the price down due to oversupply. Thus, there is a definite need for research on drying Rabbiteyes to assist many farmers of Georgia and particularly in South Georgia.

Tobacco was one of the primary crops in the present Rabbiteye blueberry growing areas of Georgia. Associated with tobacco production were tobacco driers/barns for curing tobacco before it was transported to market sale points. With the diminished tobacco production these tobacco curing barns are sitting idle. Instead of building new dryers, which can be capital intensive, it might be possible to convert these curing barns which have air flow and heating systems for on-farm drying of blueberries. Thus, any utilization of the existing structures and equipment, with appropriate modifications adapted for blueberry drying, should have direct positive economic impact on the farmers who were previously engaged in tobacco production and curing and now are blueberry producers.

Currently, sugar-infused dried blueberries are available on the market. However, most dried blueberries are made from Highbush varieties from Michigan, Maine and Chile. As the Southern Rabbiteye blueberry is firmer, has a better sugar-acid profile and enhanced shelf-life, there is great promise for developing dried products from these varieties. Studies of drying Rabbiteye varieties would help Georgia farmers in determining which varieties to plant to maximize profitability. In addition, consumers are concerned about high sugar content and have an interest in health-promoting antioxidants found in blueberries. Thus developing low-sugar formulations with optimal bioactive content is important.

## **3. GOALS AND OUTCOMES ACHIEVED**

The overall goal of the proposed project is to develop drying processes and appropriate products for Georgia Rabbiteye blueberries with optimal nutritional quality and high consumer acceptance. Specific objectives are:

- 1) To evaluate different drying technologies (including forced hot air, fluidized bed, impingement, vacuum, and microwave-assisted drying) on the quality, consumer acceptance, and economics of dried products. Continuation from Yr 1 proposal for adapting to commercial scale processing.
- 2) Examine the feasibility of converting existing unutilized tobacco curing barns into on-farm blueberry dryers.
- 3) To evaluate the size and form (fresh vs. frozen) of blueberries before drying on the drying characteristics and quality of dried blueberries.

4) To develop a process to produce low calorie sweetened dried blueberries with a natural sweetener (Stevia) for diabetic and calorie conscious consumers.

### **Objective 1: Evaluate Drying Techniques**

This objective was completed in order to evaluate different drying technologies. The details are published in a refereed journal article (Veerachandra et al. 2013). Individually quick frozen (IQF) Rabbiteye blueberry cultivars 'Brightwell' and 'Powderblue' were dried in an air-impingement dryer at 85C and 107C using two different configurations. The effect of cultivar, pick, grade, drying temperature and method on drying time and physico-chemical properties of dried blue-berries were determined. Forced air dryer and a fluidized bed dryer were used as controls. Drying times were about 50% longer at 85C compared to 107C for all drying methods. Among the drying methods; fluidized bed dryer was fastest followed by air-impingement dryer(s) and forced air dryer to achieve a final water activity of  $0.55 \pm 0.05$ . Cultivar, drying method and their interaction with drying temperature shown significant effect on drying times. Several tested variables and their specific interactions also showed significant effect on bulk density, color, texture and composition of dried blueberries. Impingement drying showed promise as an alternative to fluidized bed dryer to dry IQF Rabbiteye blueberries.

Conclusion of this study was: Based on the results of this study a significant difference in the drying time for blueberries was observed amongst different drying methods. Drying is faster at 107C than 85C for all drying methods. Impingement drying is faster than forced air dryer and slower than Jet-zone fluidized bed dryer. Blueberry cultivar and its interaction with drying temperature showed influence on the drying time. 'Powderblue' blueberries dried faster than 'Brightwell' varieties. Drying method, drying temperature, cultivar, pick time, grade and their specific interactions showed significant influence on the overall quality of dried blueberries. However, the overall quality of impingement dried blueberries was comparable with the control methods. Air impingement drying showed promise for drying Rabbiteye blueberries as an alternative to other commercial drying methods. Further improvements of air-velocities of impingement dryer to a level of 4-6 m/s might help to match up with the drying time of the Jet-zone fluidized bed dryer.

It was also concluded that the cost of drying will be highest when Jet-zone fluidized bed dryer is used due to high heating cost of significant amount of air to be heated compared to other drying techniques. Impingement type dryers (also used in roasting nuts and baking pizza and other bakery products) have great potential in drying blueberries as these types of dryers will dry the product faster than other conventional methods.

### **Objective 2: Feasibility study of converting tobacco barns to blueberry dryers**

**2a) Simulated Drying study** - A study to determine the changes needed to be made on a traditional tobacco barn to dry blueberries was conducted. In this research, the drying

environment parameters for blueberries were studied. Two parameters used in this study were temperature (85°C, 95°C and 107°C) and the air flow (high, medium, and low).

Materials and methods

*Tobacco barn:* The tobacco barn principle is as shown in Fig. 1. Multiple layers of trays filled with tobacco leaves are dispersed in the barn. A fan blows the air through a heat exchanger and the warm air is introduced into the drying chamber from the bottom side center. Then the air circulated through the trays from the bottom to the top and is released or recycled as it exits the dryer at the top side center. The amount of recycled air can be adjusted by modulating the vents openings.

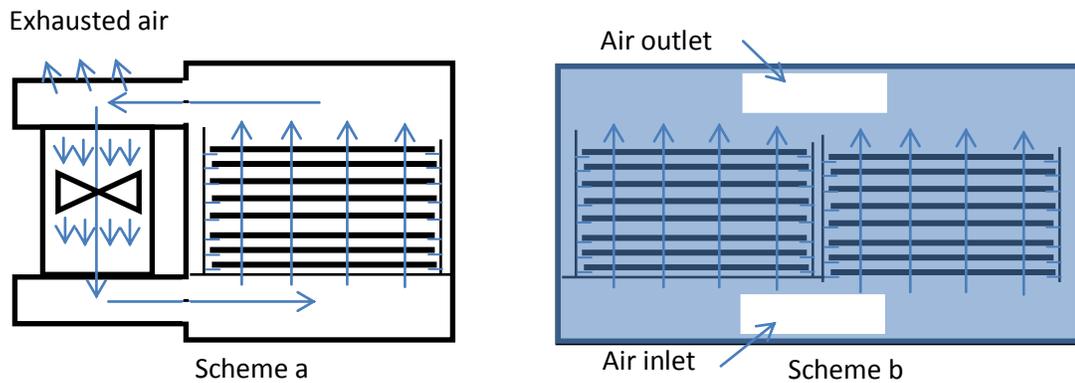
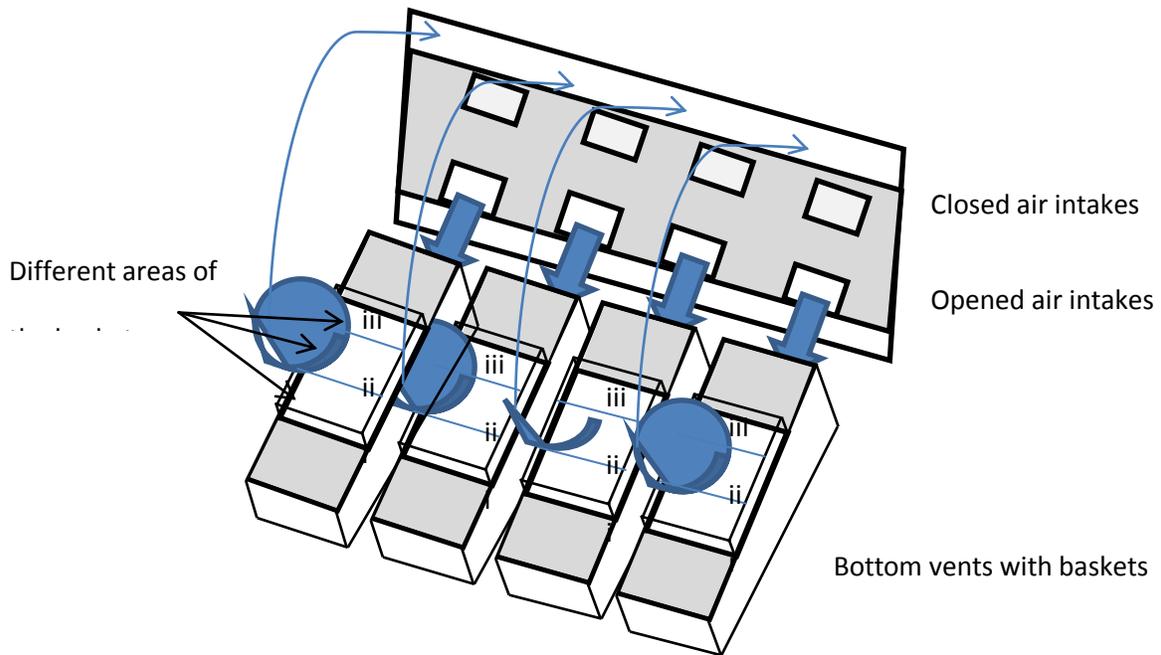


Figure 1: Scheme a- air flow in the tobacco barn view from the front / Scheme b- air flow in the tobacco barn view from the side

*Blueberries:* For the drying experiments, 30 pound batches of frozen blueberries packed in plastic bags in cardboard boxes were used.

*Impingement oven:* Due to the logistics and size of the tobacco barns, a simulated study was conducted using an impingement oven (Lincoln Impingement conveyor oven series 1400, Lincoln Foodservice Products, Inc., Fort Wayne, IN) in the pilot plant at the UGA Griffin campus facility to mimic the tobacco barn environment. In order to make the simulation as close as possible a few modifications were made to the impingement oven. Firstly, the conveyer belt was removed as the barn operates in a batch mode. Eight air inlets of the oven were reduced to 4. The four top vents were closed by placing iron sheets/covers in front of the air inlets so that the air flows only from the bottom to the top.

The bottom vents were adjusted to the baskets in which blueberries were dried and also the grids were removed from the vents. In order to have the same air flow all along the baskets the bottom vents were set. Three areas were designated (i, ii and iii) in each basket as shown in Fig. 2. In each area, the air flow was measured at five different points and an average was calculated.



*Figure 2: Scheme of the air flow in the impingement oven after modifications*

The initial moisture content of the frozen blueberries was determined by the AACC method 44-40 (Vacuum Oven method). A 2-gram sample of the frozen blueberries was weighed in an aluminum dish and placed in an oven at 98-100°C for about 5h in partial vacuum with a pressure equivalent or less than 25 mm Hg. The initial moisture content was calculated by dividing the loss of moisture (loss of weight) by the weight of the initial sample. Three replicates of frozen blueberries were done to determine the average initial moisture content.

*Temperature and air flow settings:* Experiments were conducted at three temperatures: 85°C, 95°C and 107°C and at three different air flows stated earlier. In order to have three levels of air flow, the top air inlets were used in different configurations: opened (A); half opened or half closed (B); and closed (C). By opening these air inlets, the air coming from the bottom vents

was reduced, thereby decreasing the air flow through the product. The air flow in the three different positions was measured in duplicate by using an anemometer (EXTECH 451126, Extech Instruments Corporation, Waltham, MA) through an empty basket and through the basket filled with blueberries. Measurements were taken as before, three areas per basket (i, ii and iii) and five points per area with top air inlets closed and with empty baskets. With the top air inlets closed (C); the average air flow value was 454 CFM per empty basket. With the top air inlets opened (A), the average air flow value was 209 CFM per empty basket, which represents a decrease of about 54% compared to the first condition (C). With the top air inlets half opened (B), the average air flow value was 267 CFM per empty basket which represents a decrease of about 31% from that of C.

*Drying process:* The method used to dry the blueberries is described in Fig. 3. According to a previous study by Hung et al. (2011) a pretreatment of blueberries is required to break the skins and to reduce the drying time. The berries were slightly thawed by rinsing with tap water. Then, a mechanical scarifier with a series of spiked rollers and conveyor belt with an adjustable clearance and speed was used. The products were passed through it twice to ensure that at least 50% of the berries were scarified on surface. Blueberries were weighed before and after the pretreatment to determine the loss of moisture. Four baskets were filled with about 1kg of product which was the optimum amount needed to have between 1 to 2 layers of berries in each basket. The filled baskets were placed in the impingement oven on the four bottom vents and the temperature and the air flow were set. Every 30 minutes, the baskets were weighed to monitor the drying (weight loss). The target moisture content was 17%. With the initial moisture content and the initial weight, a target weight, determining the end of the drying, was calculated. The blueberries were then stored at 4°C in a sealed plastic bag. A control sample of each basket was taken to determine the moisture content by the AACC method. A total of 9 batches of blueberries were dried.

## Results and discussion

*Air flow measurements:* The setting of the vents was done to equalize the air flow all along the bottom vents. Compared to the initial data, after the changes, the air flows were uniform except for vent 3 which had an insufficient air flow in the “b” area. This allowed the product to dry more uniformly.

With the top air inlets closed, the average air flow value is 454 CFM per empty basket. With the top air inlets half opened, the average air flow value is 267 CFM per empty basket which represents a decrease of about 31%. With the top air inlets opened, the average air flow value is 209 CFM per empty basket, which represents a decrease of about 54% compared to the first condition. The air flow data are shown in Table 1. The three different settings led to three different air flows. Using the iron sheets to block the top air intake vents were a functional way to get different air flows for this study.

By adjusting the vents we were able to achieve a more uniform airflow. Even so, the middle area (ii) had the least air flow while the end area (iii) had the highest air flow. In configuration B, air flows were not very uniform between the different baskets: basket 1 had an air flow significantly lower than the others.

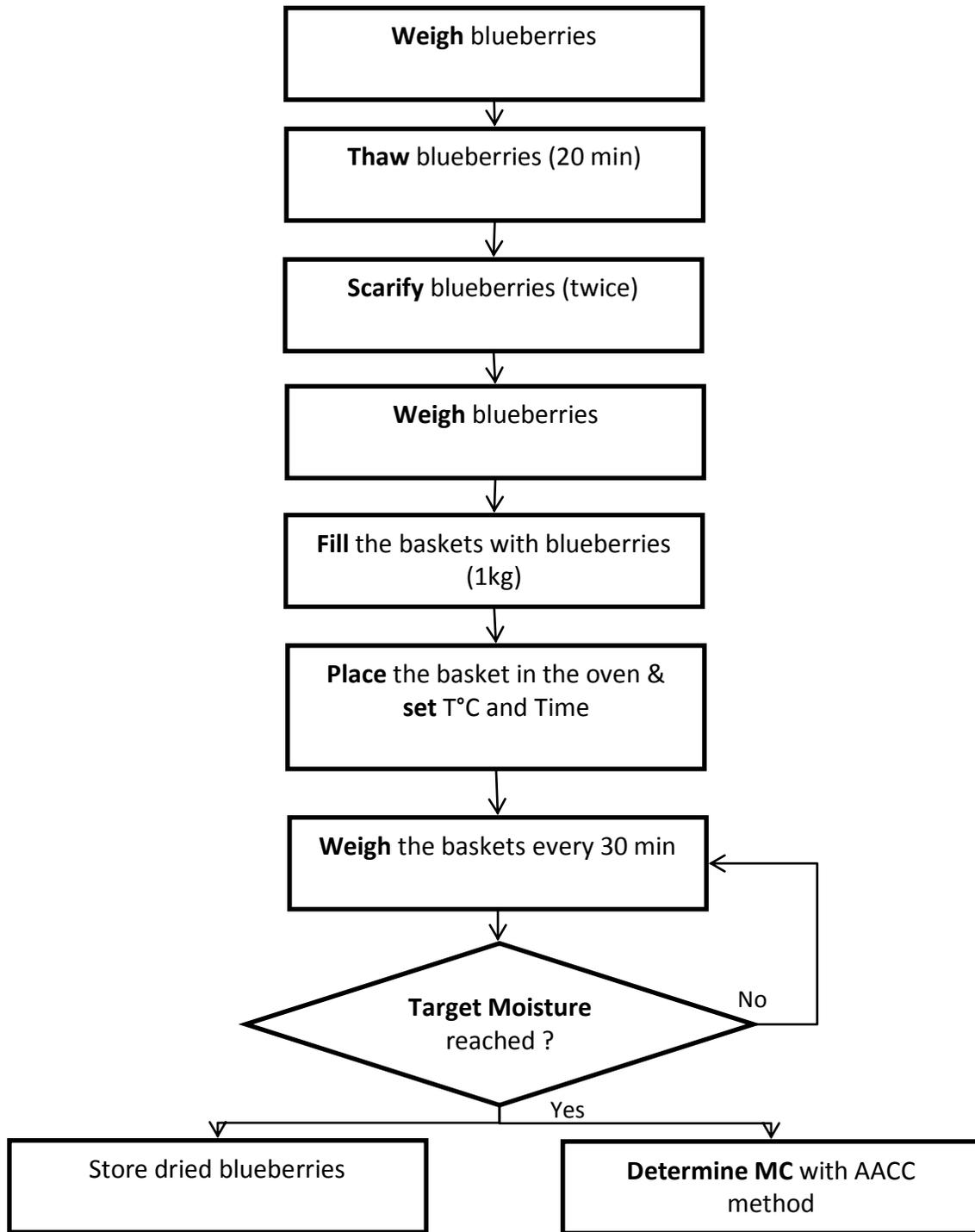


Figure 3: Dry blueberries process

	Air flow (CFM)					
	Opened air inlets		Half opened air inlets		Closed air inlets	
	Empty	Full	Empty	Full	Empty	Full
Basket 1	200.8	113.3	190.4	177.1	483.8	318.6
Basket 2	217.1	209.1	307.4	257.8	471.9	353.6
Basket 3	226.6	160.4	282.4	153.9	444.9	290.1
Basket 4	193.5	170.0	288.6	198.3	413.6	286.9
Mean	209.5	163.2	267.2	196.8	453.6	312.3

*Table 1: Main air flow results (CFM) in each basket with the different configuration with and without blueberries*

When the baskets are filled with blueberries, the air flow decreased, as expected, but was still sufficient. The three configurations presented three different levels of air flow. Respectively, in configurations A, B, C, the mean air flows were 163 CFM, 197 CFM and 313 CFM. The air flow values between the configuration A and B may not be enough to make any difference during the experiments; however, in each case, the end area (c) had the highest air flow in each basket whereas the middle area (b) had the lowest values. In each configuration, the values were less uniform between the different baskets. After several tests of the different vent settings, we still could not achieve uniform air flow, especially when the top air vents were either opened or half opened. The incoming air from the top vent disturbed the air flow in the oven and disrupted the measurements causing unbalanced values that could distort the drying monitoring.

*Initial moisture content:* The results of the initial moisture content are presented in the Table 2. The average moisture content (MC) of the frozen blueberries was 82%. This became our target value for the monitored drying process. The slight difference in the MC of the replicates is explained by the fact that the berries were not sorted: their size and ripeness were not uniform. This also caused a distortion in the drying experiments. In a study conducted by MacGregor (2005) it was proven that bigger blueberries had higher moisture contents and lost mass at a faster rate than smaller ones.

*Table 2: Initial moisture content determination results*

	Dried dishes (g)	Blueberries (g)	Dried blueberries (g)	Moisture content (%)	Mean moisture content
Sample 1	22.7912	2.0067	0.3698	81.57%	82.00%
Sample 2	23.4783	2.0759	0.3637	82.48%	
Sample 3	22.5312	2.004	0.3618	81.95%	

*Drying:* Nine sample batches of berries were dried and the results are shown in Table 3 and Figure 4. The drying times to reach the 17% target moisture content varied from 5h to less than 2h. The higher the temperature was and the higher the air flow was, the quicker the blueberries dried. At 85°C, the oven drying took 4h to 5h to reach the target moisture content. No significant difference was observed between the configuration B (half open) and A (open). With the highest air flow (C: closed), which was twice higher than in A, the drying was 20% faster and lasted almost 4h only. At 95°C, the experiments took 2h 45min to 3h. Once again, no significant difference was detected between configuration B and configuration A. A period of 3h was needed to obtain blueberries with 17% of moisture content. And with the top inlets closed (C), the drying time was 15 min shorter which is about 8% faster only than B and C.

At 107°C, it lasted 1h 45 min to 2h 10 min to dry the blueberries depending on the air flow. This time, the three configurations presented three different drying times: in configuration A, it took 2h 10 min to reach the target; in configuration B, it was 8% quicker with a drying time of 2h and in configuration C, there was a 20% saving time since it took only 1h 45 min. With the top air inlets closed, the drying times at the three different temperatures varied from 1h 45 min to almost 4h. When the temperature was increased by about 10°C, the needed time decreased by about 1h at 85°C it took less than 4h; at 95°C, it lasted 2 h 45min and at 107°C only 1h 45min. With the top air inlets half opened (B), the drying times varied from 2h to 4h 45min. At 85°C, 4h 45 min were needed to reach the target moisture content. At 95°C, it took 3h and at 107°C, the drying lasted 2h. With the top air inlets opened (C); the experiments lasted from 2h10 to almost 5h. At 107°C, the drying time was 2h 10min; at 95°C it was 3h and at 85°C it was close to 5h.

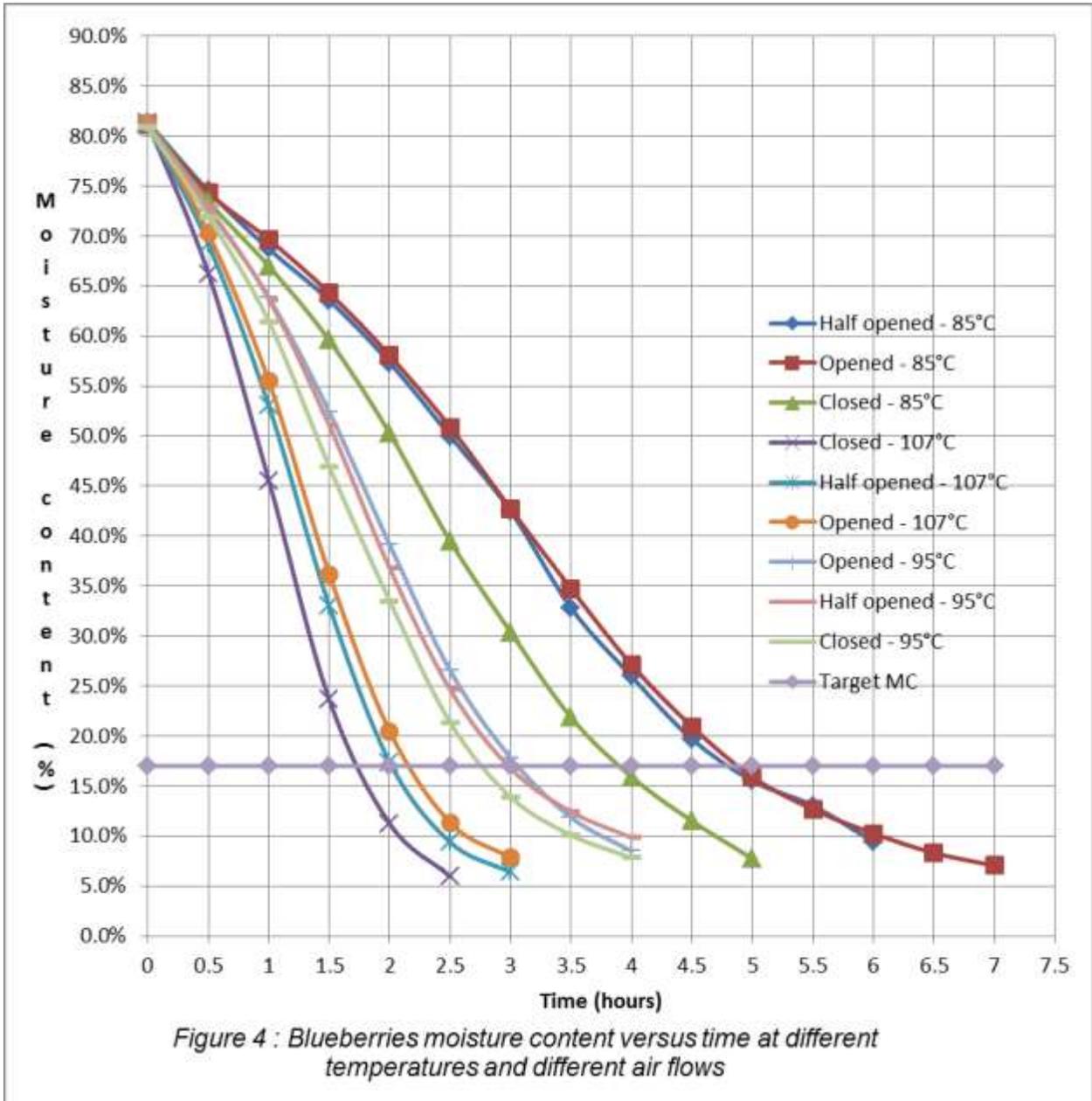
*Table 3: Blueberries moisture content versus time in each drying*

Time (h)	85°C			95°C			107°C			Target MC
	Half opened	Opened	Closed	Opened	Half Opened	Closed	Closed	Half opened	Opened	
0	81.4%	81.1%	81.4%	81.1%	81.2%	80.9%	81.3%	81.1%	81.3%	17%
0.5	74.5%	74.4%	73.5%	72.7%	72.9%	71.9%	66.2%	69.2%	70.3%	17%
1	68.7%	69.7%	67.0%	63.9%	63.7%	61.4%	45.5%	53.0%	55.5%	17%
1.5	63.6%	64.3%	59.6%	52.4%	51.1%	46.9%	23.6%	33.0%	36.2%	17%
2	57.3%	58.0%	50.3%	39.1%	36.8%	33.5%	<b>11.2%</b>	17.4%	20.5%	17%
2.5	50.0%	50.9%	39.5%	26.5%	24.6%	21.3%	6.0%	<b>9.4%</b>	<b>11.3%</b>	17%
3	42.5%	42.7%	30.4%	17.8%	<b>16.8%</b>	<b>13.9%</b>		6.4%	7.8%	17%
3.5	32.8%	34.7%	21.8%	<b>11.8%</b>	12.4%	10.1%				17%
4	26.0%	27.1%	<b>15.9%</b>	8.5%	9.8%	7.8%				17%
4.5	19.7%	20.9%	11.5%							17%
5	<b>15.5%</b>	<b>15.9%</b>	7.7%							17%
5.5	13.0%	12.7%								17%
6	9.4%	10.2%								17%
6.5		8.3%								17%
7		7.0%								17%

In the configurations A and B, the decrease in drying time when we proceeded at 107°C rather than 95°C was about 1h like in configuration C. But at 85°C, the drying times were 1h 45 min longer than at 95°C instead of 1h only like in configuration C. This suggests that above 95°C the decrease in drying time is not proportional to the temperature and increase in temperature over 107°C may not be significant in terms of performance.

The experiment results showed that, in terms of performance, it is more efficient to dry at a higher temperature. The time saved by the use of air at 107°C instead of 85°C was approximately 3h, or 60% less. By drying at 95°C instead of 85°C, approximately 40% of the drying time can be saved. Moreover, according to López et al., (2010), the decrease in terms of nutritional quality is less significant at high temperatures than at low temperature because of the long process time which leads to reduction of

nutritional property and antioxidant activity. However, in this study the temperature range was 50°C to 90°C. And the differences in the initial product (blueberry type) and in the process probably have an impact which should be considered.



Regarding the air flow, the influence was significant too. In fact, even if there was no real difference in the drying times between configuration A and B, the configuration C showed an improvement of the drying time: 313 CFM instead of 164 CFM lead to a 20% time saving. The air flow showed an influence on the drying time but was less significant than the temperature. In order to see an improvement, the air flow had to be doubled. Nonetheless, MacGregor (2005) found that increasing air velocity would increase both drying rate and yield more than would a similar change in air supply temperature. Still in MacGregor's study, the temperature range was 71°C to 79°C and the air velocity range was 0.18 m/s to 0.40 m/s for drying times between 3h and 4h. In comparison, we experimented at air velocities varying from 0.86m/s to 1 m/s to 1.65m/s. And at 85°C, it took 5h to reach the target moisture content. Our materials and methods weren't similar. In term of process, a worthy difference was in the circulation of the air: in our experiments, most of the air was recycled whereas in MacGregor's study all of it was exhausted. In this latter case, the supposedly dry air remained dry whereas with the oven the air gained moisture until saturated. This parameter should be considered in an efficient drying system.

*Conclusion:* In order to better understand the effects of the air temperature and the air flow on drying time of Alma frozen blueberries, a series of drying experiments were done. Modifications on the impingement oven were done to have a method similar to the tobacco barn. The experiments suggested that the higher the temperature and the air flow were, shorter was the drying time.

## *2b) Feasibility analysis*

A schematic sketch with dimension of a typical tobacco barn is shown in Fig. 5 and pictures of tobacco barns and associated accessories are presented in Fig. 6. Evaluation of the tobacco barns and the laboratory drying studies revealed that the cost of converting existing tobacco barns will be not cost effective. Specific reasons are as follows:

### *1) Fans and Furnace*

The fans and furnace are rusty and have not been used for an extensive period of time. It will be more cost effective to replace them with new units than to try salvaging/repairing for use for drying berries for human consumption.

### *2) Drying racks*

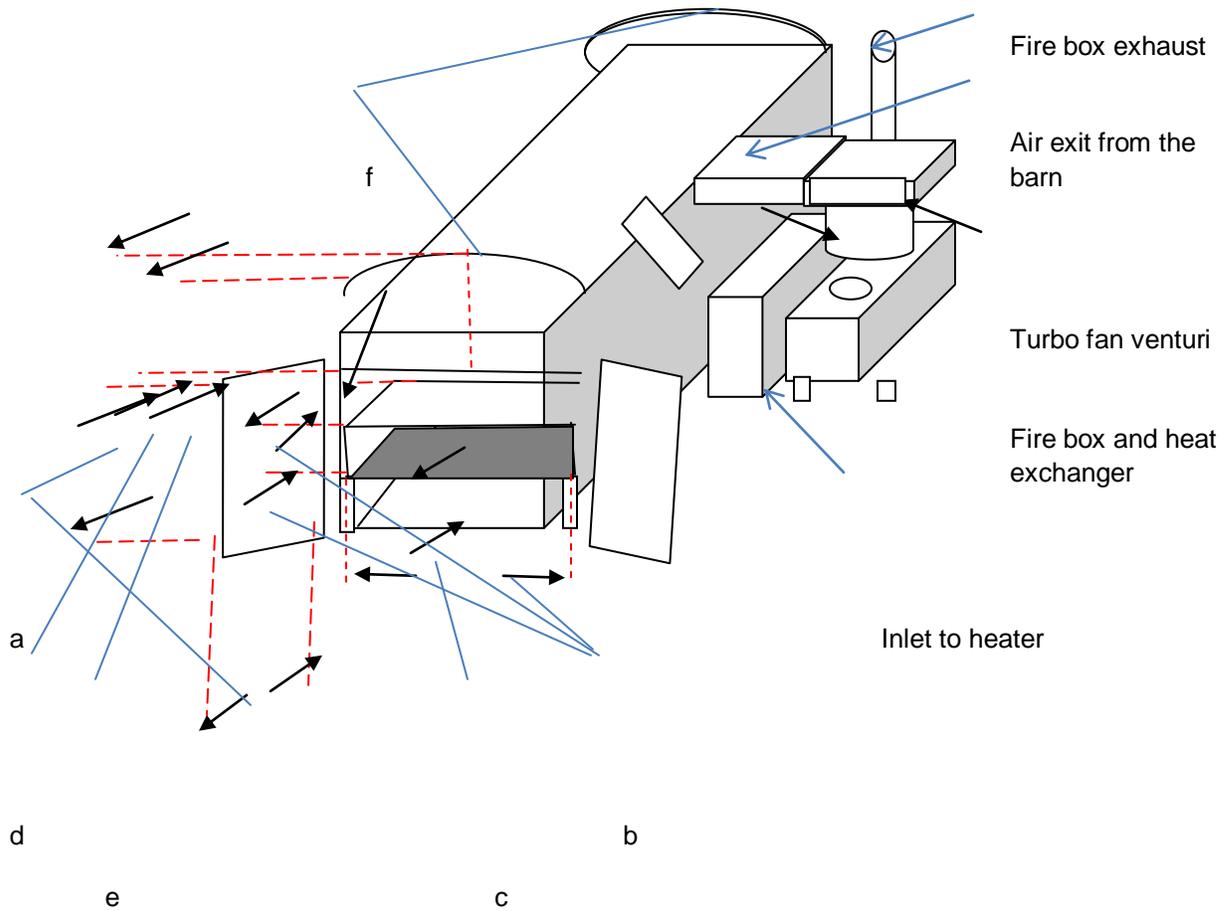
The grates (drying racks) used for drying tobacco cannot be used in the existing conditions because they are made of iron/steel and badly rusted; also for drying food grade products, the surfaces have to be fabricated from stainless steel. As a result, all grates (drying racks) have to be replaced with new stainless material.

### *3) Flooring*

The floor surface under the plenum chamber of tobacco barns is usually compact dirt/gravel. These floor conditions are not acceptable for drying food products. The floor has to be redone with poured concrete so that the floor can be kept sanitarily clean.

4) Heat losses

The drying chamber should be fairly airtight to reduce energy losses to prevent escape of heated air; the tobacco barns in the existing conditions do not meet that requirement.



Taylor Tobacco Barn metal frame /w sprayed on insulation

Dimensions in inches

a	Dual doors	47	85	
b	Box (iron & expanded mesh)	47	91	91
c	Plenum Chamber	26	85	
d	Crown	17	above door	
e	Drip edge	11	above door	
f	Barn	337	deep	(Approx 28 ft)



Figure 6: Pictures of tobacco barn and associated accessories



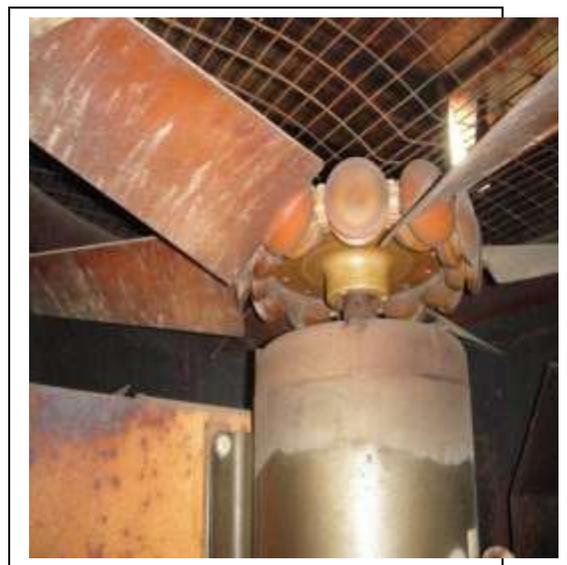
a) View of two tobacco barns in a field



b) Front loading door of the tobacco barn



c) Burner and chute for heated air



d) Fan over the heated air chute



e) Stack of rusted iron grates (drying racks) for tobacco drying



f) Plenum chamber below the stack of grates (drying racks)



g) Another view of plenum chamber



h) A side wall and ceiling of the drying chamber showing blown insulation

5) Insulation material

Last but not the least; the inside walls and the ceilings of drying chamber in the existing barns have blown insulation. The interior has to be gutted and reinsulated to meet sanitary requirements of using the drying chambers for drying food grade products (drying blueberries).

The conclusive analysis is that it is not cost effective to convert/refurbish the existing tobacco barns into blueberry dryers.

**Objective 3: Drying characteristics of blueberries as affected by size and form (fresh vs. frozen)**

Fresh blueberries were obtained from a local market, sorted and graded into three sizes (large, small and extra small). The sizes are defined in Table 4. Extra small berries were discarded as they were immature, damaged or defective. Graded berries were quick frozen and then used for drying experiments. Before drying the frozen and fresh samples were scarified with a lab scarifier to rupture the skin to aid in drying (a process commonly used in blueberry drying). One kg batches (duplicate) of fresh and frozen, and large and small size berries were dried in an impingement oven at 85C for 4 to 5 hours. Initial moisture content of samples was determined as well as periodic weights of the samples during drying were recorded to estimate change in the product moisture content. Drying data in terms of moisture content of blueberries (%) is presented in Table 5.

Table 4: Size grades of blueberries

	<b>Weight of 100 berries (gm)</b>	<b>Effective diameter (cm)</b>
<b>Large</b>	181	Greater than 1.51
<b>Small</b>	140	Between 1.39 and 1.50
<b>Extra small</b>	91	Less than 1.38

**Drying of fresh vs. frozen berries -**

Data for small and large size berries is graphed in Figs. 7 and 8. It shows that frozen berries dried much faster than the fresh berries. This effect was more pronounced with the larger size berries. The faster drying rate of frozen berries is attributed to improved scarification (without losses of juices and integrity of berries. Also larger berries led to better scarification than smaller ones thus resulting in faster drying.

**Drying of small vs. large berries -**

Small size fresh berries initially dried at a faster rate than the large size fresh berries; however, that difference became negligible after 3 hrs of drying. Whereas when the frozen berries were

dried, large berries dried at a faster rate (Figs. 9 and 10). Again this is attributed to the better scarification affect.

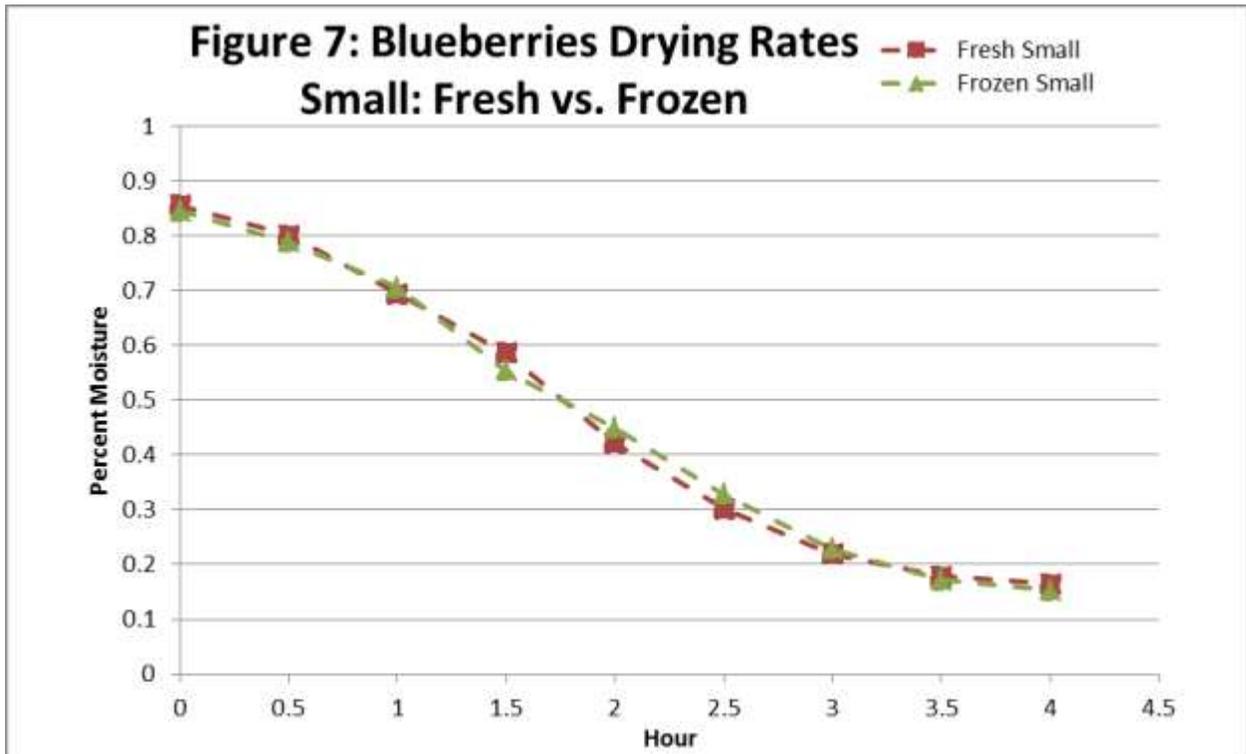
Drying time (Hours)	Fresh	Frozen	Fresh	Frozen
	Small		Large	
0	85.5%	84.5%	84.7%	84.5%
0.5	80.1%	78.8%	80.3%	70.9%
1	69.4%	70.5%	72.7%	58.9%
1.5	58.6%	55.3%	65.6%	41.2%
2	42.2%	44.9%	53.4%	28.6%
2.5	30.1%	32.9%	41.1%	13.1%
3	21.9%	22.9%	29.1%	11.5%
3.5	17.8%	17.1%	19.9%	7.4%
4	16.5%	15.3%	16.5%	6.0%

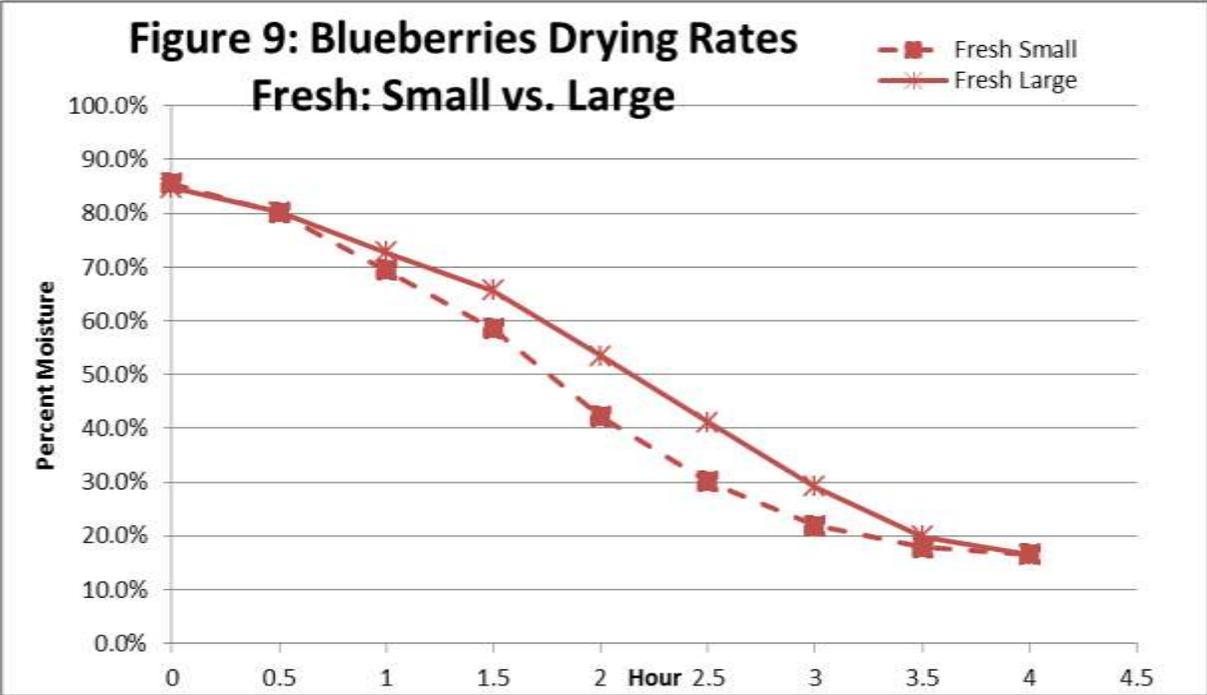
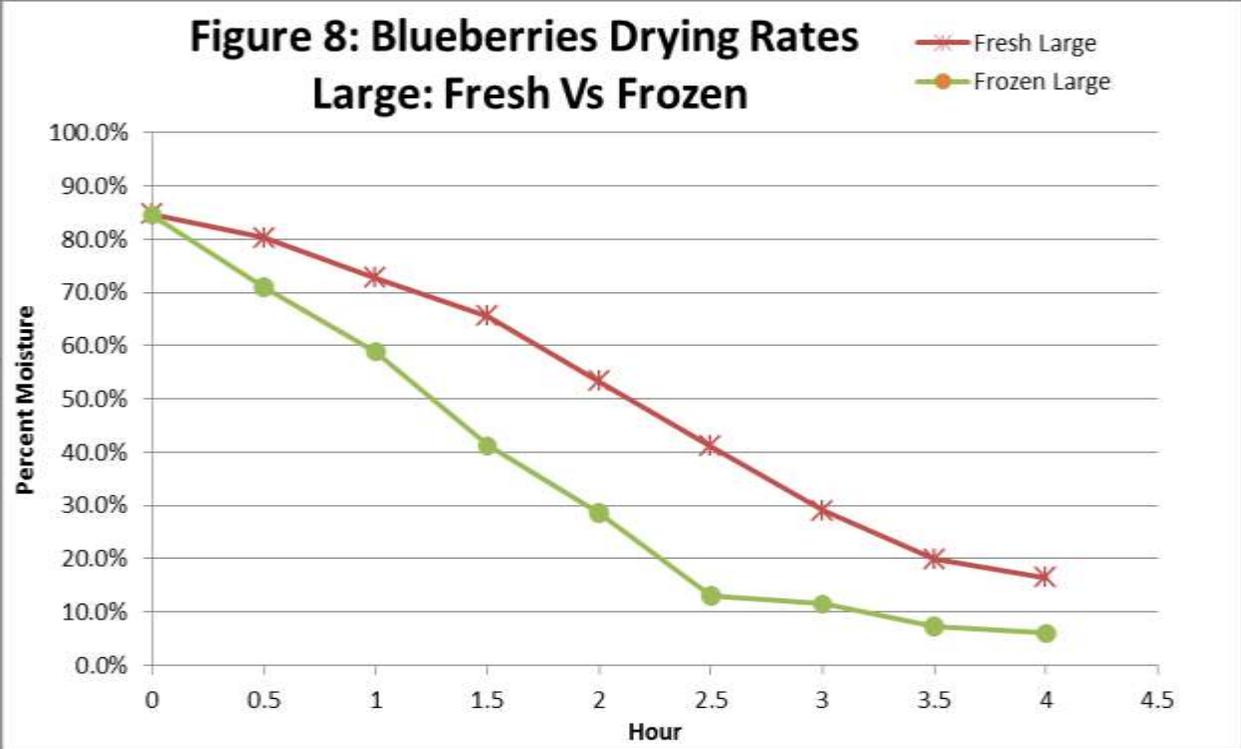
Table 5: Blueberry Drying Data - Small & Large size, and Fresh & Frozen

**Objective 4: Evaluating low calorie sweeteners for enhancing sweetness of dried blueberries.**

Large size frozen berries dried at 85 C to moisture content of 25% (approximately for 2.4 hrs) were used for this part of study. The dried berries were rehydrated for 2 hrs (Figs. 11a and 11b) in sucrose solution or low calorie artificial sweeteners (such as Nectresse and Stevia). Both the artificial sweeteners are considered natural as they are derived from Monk fruit and leaves of a stevia plant, respectively. An untrained panel of 5 persons was used to conduct sensory evaluation on a 9-point scale of “dislike extremely” to “like extremely.” The score sheet employed is presented in Appendix located at the end of this report. A total of five samples were evaluated as described in Table 6. The attributes examined were: appearance, moistness, sweetness, tartness and overall preference.

The “reference” sample (commercially available product – dried, rehydrated and infused with high level of sucrose) received the highest scores. All of the other samples received a score greater than 5; which refers to a neutral opinion such as “like slightly.” It is believed that additional studies can result in producing rehydrated acceptable berries using a natural low-calorie sweetener.





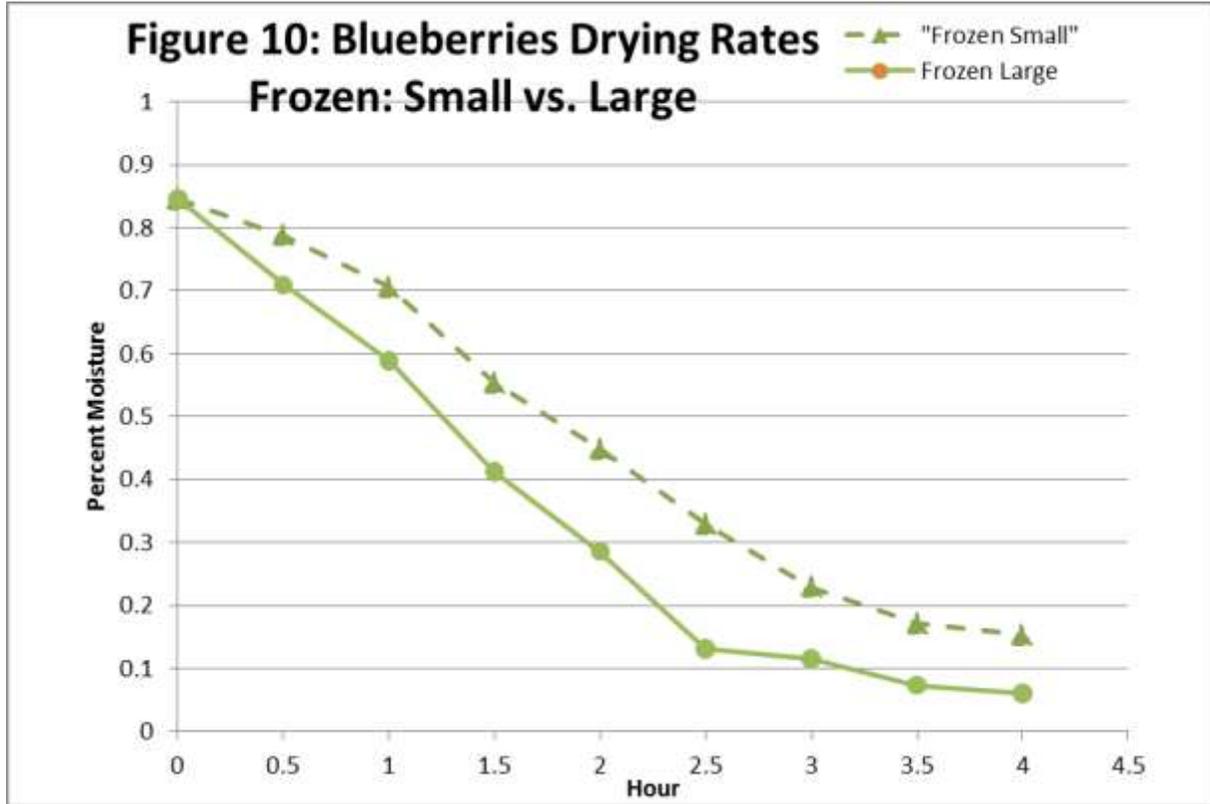


Table 6: Sensory evaluation data of dried, rehydrated and sweetened blueberries

Sample Type	ATTRIBUTES				
	Appearance	Moistness	Sweetness	Tartness	Overall Preference
<b>Control***</b>	6.0*	5.8	5.6	5.4	5.6
	<i>1.87**</i>	<i>2.17</i>	<i>2.51</i>	<i>2.51</i>	<i>2.61</i>
<b>Reference****</b>	7.2	6.8	7.2	6.2	7.0

	<i>1.79</i>	<i>0.84</i>	<i>0.84</i>	<i>0.84</i>	<i>1.22</i>
<b>Sucrose</b>	6.6	6.0	6.0	6.0	5.8
	<i>1.34</i>	<i>2.12</i>	<i>1.87</i>	<i>2.00</i>	<i>2.39</i>
<b>Nectresse</b>	6.2	6.2	5.4	5.2	5.8
	<i>1.64</i>	<i>1.79</i>	<i>1.52</i>	<i>1.79</i>	<i>2.28</i>
<b>Stevia</b>	6.4	5.2	5.0	5.4	5.6
	<i>2.07</i>	<i>1.64</i>	<i>2.45</i>	<i>1.67</i>	<i>2.07</i>

\* Data is mean of 5 values

\*\* Standard deviation values presented in bold italics.

\*\*\* Control refer to rehydration without any sweetener (sucrose or otherwise)

\*\*\*\*"Reference" refers to commercial product (see picture in Fig. 12)

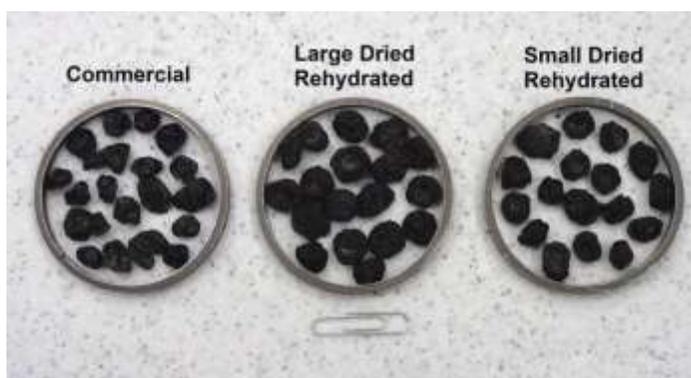


Figure 11a: Three different type of blueberries: Commercially packaged, Lab dried and rehydrated - large and small size



Figure 11b: Same as Figure 1a but larger magnification



Figure 12: Commercially available dried, rehydrated and sugar infused blueberries in a bag package

#### 4. BENEFICIARIES

There were no direct presentations to the growers. We tried to contact the Bacon County/Alma Economic Development Authority, our collaborator, during the first phase of the study to make a presentation, but did not get a response. We did, however provide them with a copy of the report.

The studies reported provide data on various methods of drying and any changes in nutritional and sensory characteristics. The information generated also includes potential for infusing natural sweeteners in dried blueberries for enhanced acceptability. The knowledge gained is of direct benefit to the blueberry producers and processors of value-added products from blueberries. Sensory, nutritional and microbiological data and results were presented by Hung in Part I of the study (Hung et al., 2011).

## **5. LESSONS LEARNED**

### **Drying Techniques**

- a) Significant difference in the drying time for blueberries was observed among the different drying methods.
- b) Drying is faster at 107C than 85C for all drying methods.
- c) Impingement drying is faster than forced air dryer and slower than Jet-zone fluidized bed dryer.
- d) Overall quality of impingement dried blueberries was comparable with the control methods.
- e) Air impingement drying showed promise for drying Rabbiteye blueberries as an alternative to other commercial drying methods.
- f) Cost of drying will be highest when Jet-zone fluidized bed dryer is used due to high heating cost of significant amount of air to be heated compared to other drying techniques.

### **Feasibility of Converting Tobacco Barns into Blueberry Driers**

The conclusive analysis is that it is not cost effective to convert/refurbish the existing tobacco barns into blueberry dryers.

### **Drying characteristics of blueberries as affected by size and form (fresh vs. frozen)**

- a) Frozen berries dried much faster than the fresh berries. This affect was more pronounced with the larger size berries.
- b) Fresh berries initially dried at a faster rate than the large size fresh berries; however, that difference became negligible after 3 hrs of drying.
- c) Frozen large berries dried at a faster rate than frozen small berries.

### **Evaluating low calorie sweeteners for enhancing sweetness of dried blueberries**

The “reference” sample (commercially available product – dried, rehydrated and infused with high level of sucrose) received the highest scores. All of the other samples received a score greater than 5, which refers to a neutral opinion such as “like slightly.” It is believed that additional studies can result in producing rehydrated acceptable berries using a natural low-calorie sweetener such as Nectresse and Stevia.

## **6. CONTACT PERSON**

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## 7. ADDITIONAL INFORMATION

1. References
2. APPENDIX: Blueberry Evaluation Form

### **References**

AACC International Method 44-40.01: Moisture – Modified Vacuum-Oven Method.

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López, J., Uribe, E., Vega-Gálvez, A., Miranda, M., Vergara, J., Gonzalez, E., & Scala, K. (2010). Effect of Air Temperature on Drying Kinetics, Vitamin C, Antioxidant Activity, Total Phenolic Content, Non-enzymatic Browning and Firmness of Blueberries Variety O'Neil. *Food and Bioprocess Technology*, 3(5), 772-777.

MacGregor, W. (2005). Effects of Air Velocity, Air Temperature and Berry Diameter on Wild Blueberry Drying. *Drying Technology*, 23(1–2), 387–396.

Veerachandra K. Yemmireddy, Manjeet S. Chinnan, William L. Kerr, Yen-Con Hung. 2013. Effect of drying method on drying time and physico-chemical properties of dried Rabbiteye blueberries. *LWT -Food Science and Technology*, 50 (2). p. 739-745.

**APPENDIX: Blueberry Evaluation Form**

Date: \_\_\_\_\_ Sample:   R   Initial: \_\_\_\_\_

Please evaluate each sample and check the space that best reflects your feeling about the sample. If you wish to comment, you may do so on the space provided.

**Appearance**

Dislike	Dislike	Dislike	Dislike	Neither Like	Like	Like	Like	Like
Extremely	Very Much	Moderately	Slightly	Nor Dislike	Slightly	Moderately	Very Much	Extremely
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1	2	3	4	5	6	7	8	9

Comments

---

**Moisture**

Dislike	Dislike	Dislike	Dislike	Neither Like	Like	Like	Like	Like
Extremely	Very Much	Moderately	Slightly	Nor Dislike	Slightly	Moderately	Very Much	Extremely
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1	2	3	4	5	6	7	8	9

Comments

---

**Sweetness**

Dislike	Dislike	Dislike	Dislike	Neither Like	Like	Like	Like	Like
Extremely	Very Much	Moderately	Slightly	Nor Dislike	Slightly	Moderately	Very Much	Extremely
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1	2	3	4	5	6	7	8	9

Comments

---

**Tartness**

Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like Nor Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1	2	3	4	5	6	7	8	9

Comments

---

**Overall Preference**

Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like Nor Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1	2	3	4	5	6	7	8	9

Comments

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**19. Georgia Association of Conservation District Supervisors – Honey and Pollinator Habitat Promotion Program – Final Performance Report**

**Project Summary**

The Honey and Pollinator Habitat Promotion Program was conducted to enhance the competitiveness of Georgia’s \$70 million beekeeping industry as it faces many challenges. Colony Collapse Disorder, Varroa mites, disease, and improper pesticide use have contributed to declines in honey production and a decrease in beekeepers’ incomes. Georgia’s agricultural productivity is directly related to the health of honey bees, since more than ninety food, fiber, and seed crops rely on honey bees for

pollination. Many of Georgia's specialty crops, such as watermelons, peaches, and strawberries, are heavily dependent upon honey bees for pollination. The program increased the public's awareness of local honey producers and taught adults and youth about the necessity of healthy pollinator habitat.

### **Project Approach**

Georgia's beekeeping industry was promoted at the 2011 Georgia Association of Conservation District Supervisors (GACDS) Annual Meeting and at soil and water conservation district meetings. At the Annual Meeting, the GACDS Auxiliary were introduced to tips on cooking with honey and enjoyed a taste test of honey from different regions of Georgia. Five workshops were planned and conducted by partners throughout the state to promote local honey and educate landowners and high school students about establishing and maintaining pollinator habitat. Both backyard gardeners and farmers appreciated learning more about pollinators' affect on Georgia's specialty crops and how individuals can help improve habitat.

A directory of beekeepers, including facts about honey and its health benefits, was created and distributed statewide at GACDS meetings and events. A project summary and links to detailed information on beekeeping were added to the GACDS website. Program partners collaborated to assist students with the design and installation of seven pollinator habitat demonstration gardens at schools and other educational sites. Program participants enjoyed the honey taste tests offered at events to bring attention to the consumption of local honey.

### **Goals and Outcomes Achieved**

Project activities that achieved the performance goals and measurable outcomes for the project were:

2011 GACDS Annual Meeting breakout session and exhibit

Seven pollinator habitat demonstration gardens (6 were proposed) were installed at:

-the site of the future GACDS educational center

-the Hardigree Wildlife Sanctuary

-Stephens County High School

-Montgomery County High School

-Henry County

-Atha Road Elementary School

-Southside Elementary School

Six honey and pollinator habitat workshops (5 were proposed) were presented to:

-Franklin County Young Farmers (52 in attendance)

-Lamar County/Towaliga Soil and Water Conservation Districts' (SWCD) field day (44 in attendance)

-Natural Resources Conservation Workshop (187 high school students and 12 advisors)

-GACDS Group I Summer Meeting (21 in attendance)

-GACDS Supervisor Training Meetings (106 in attendance)

-GACDS Group II Summer Meeting (55 in attendance)

-350 soil and water conservation district supervisors learned more about Georgia's beekeeping industry and pollinator habitat via the above meetings/events, GACDS monthly reports distributed at SWCD meetings, and printed materials.

-187 high school students and 12 advisors learned about Georgia's beekeeping industry and pollinator habitat via the backyard conservation class held at the 50th Annual Natural Resources Conservation Workshop.

-The regional guide (bee brochure) was compiled and distributed in June 2011. There was information regarding 42 Georgia honey producers within the guide. A survey was sent in mid-January 2012, to those 42 producers in order to determine if their sales increased by 5% over the 2009 honey sales; 12 producers responded. Out of the twelve, eight said they had at least a 5% increase in sales since the regional guide came out. One producer had a decrease in sales, and three of the producers would not share their sales information. Therefore, approximately 20 percent of the producers in the guide saw an increase of at least five percent.

**-We developed pollinator habitat curriculum for our demonstration projects. The curriculum included the following:**

a. We began each lesson by asking the students how plants are pollinated, what type of animals are considered pollinators, and why we should be concerned about conserving pollinator habitats, in order to test the students' knowledge of pollinators, specifically, honey bees. We explained and discussed the answers with each group.

- b. We explained how honey bees live by using the beehive demonstration box (please see attached PDF).
- c. If it was applicable, we allowed the students to taste different honeys. We made sure to discuss why the honeys taste different.
- d. We introduced the students to plants that are best suited for a pollinator habitat garden.
- e. If it was applicable, a pollinator habitat garden was installed.
- f. Finally, we revisited the questions from the beginning of the lesson, in order to test the students' increase in knowledge of honey bees and conserving pollinator habitat.

-There were 275 students, ranging from kindergarten to high school age, who participated in the demonstration projects. We gave oral test-type questions at the beginning and the completion of each project. All participants had at least some increase in their knowledge of the importance of pollinator habitats. In fact, most were excited to learn something they previously knew nothing about, and something that was so interesting.

-We were not able to conduct an Auxiliary cooking class, as the 2010 and 2011 annual meeting conference venues would not allow for outside food to be brought into the venue. However, we were allowed to hold honey tastings during the meeting, and we gave a short presentation to the Auxiliary group on ways to incorporate honey while cooking and the health benefits of honey.

-We have no measured evidence that we recruited new beekeepers. If we were to measure this in the future, the easiest way would be to provide the Georgia Beekeepers Association with a short survey for new members.

### **Beneficiaries**

The Georgia Beekeeping Association benefited from HPHPP by being publicized at all meetings held by GACDS; also 42 beekeepers benefited from HPHPP by their information being distributed in the "Georgia's Beekeeping Industry" brochure that was created and distributed by GACDS. The soil and water conservation district supervisors benefited from the HPHPP by attending meetings about pollinator habitat improvement on the backyard and farm scale, attending meetings on the importance of pollinators on the agriculture industries, and participating in honey tastings to learn about the different types of honey and the benefits of eating honey. Over 250 elementary and high school students benefited from HPHPP through lessons taught and habitat gardens installed at five schools and one workshop.

### **Lessons Learned**

The 350 soil and water conservation district supervisors learned about the importance of pollinators habitat improvement on the backyard and farm scale, the importance of

pollinators on other agriculture industries in Georgia, and the benefits of honey. Over 250 elementary and high school students learned about the benefits of pollinators, how to create pollinator habitat, and the benefits of eating honey. Through the “Georgia’s Beekeeping Industry” brochure over 500 consumers learned facts about honey and its health benefits along with the contact information for local beekeepers throughout Georgia.

**Contact Person**

GACDS President Danny Hogan

478-984-6415

[hogansquarterhorsefarm@yahoo.com](mailto:hogansquarterhorsefarm@yahoo.com)

**Additional Information**

2011 GACDS Annual Meeting program

photos of demonstration garden installation

beekeeper brochure

Lamar County/Towaliga SWCD Pollinator Habitat Field Day program



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## DESCRIPTIONS OF PHOTOGRAPHS

### 1a. Capped Honey

This frame shows mostly capped honey cells. The bees collect nectar and store it in the cells where the moisture content must be reduced to below 18.4% at which point it is considered 'ripe' and ready for the bees to cap. The bees secrete wax from their wax glands on their abdomen to cap the cells. When the honey is first capped the frame appears a pretty white color, but as it ages and bees walk across the cappings, the color darkens. Typically frames are filled up from the center of the frame outward, and also from the center of the super out toward the edges.

### 1b. Queen

There is one queen per colony. The queen is identified by her long and slender abdomen. The drones are also larger than the workers, but are more round and usually have more hair on their body. In the picture there is a circle of bees around the queen. These bees are called the attendant bees whose job it is to take care of the queen. They will groom and feed the queen as needed. Also note the capped honey to the left of the frame and the cells full of different colored pollen on the right side of the frame.

### 2a. Pollen

Honey bees collect nectar and pollen from flowers. The pollen is carried back to the hive by a bee on its pollen sacs, and then it is mixed with a small amount of nectar and stored in the cells of the hive. Pollen is usually found in the brood chamber, as its main use is for feeding the larvae prior to being capped. Also on this frame is some capped honey on the left side, and a few capped brood cells in the center.

### 2b. Queen cup

Queen cups are not unusual and should not cause alarm. These may be used if and when the workers feel there is a need to produce a new queen, but may remain unused for very long periods if not needed. If there is a need to produce a new queen, the workers are able to transfer eggs into the cup and then feed it the special diet of royal jelly it needs in order to develop into a queen. During this process the queen cup becomes longer and more oval shaped as the worker bees add wax to form the queen cell. To the left of the circle is capped brood and along the top edge is capped honey.

### 3a. Larvae

This is a brood frame showing a close-up of worker larvae of various ages. When they first hatch, larvae appear as bee egg-sized, C-shaped, white "worms" and grow over the next six days until the "C" closes in on itself to fill the whole bottom of the cell. Some of the larvae, particularly near the top of the inset, have almost reached the stage where the attendant worker bees will cap the cell over with a wax capping as has already been done with about six of the cells in the upper right. Most of the brood to the left and in the middle of the frame has already



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completed the larval stage and is now capped. Its proximity to the open brood suggests that it was recently capped and therefore has close to twelve days before it will hatch.

### 3b. Eggs

The eggs are small, white, and elongated, appearing similar to grains of rice. They are placed in the bottom of empty cells by the queen. At first the egg stands on end, but as it ages, the egg will lay over on its side. It will remain an egg for three days before it will hatch into a larva. If searching for the queen, this would be a good place to find her.

### 4a. Mixed Brood

This frame shows brood on either side of the transition from open brood in the larval stage to capped brood in the pupal stage. The brood area is only covering about half of this side of the frame, which suggests either that we're looking at a hive late in the brood rearing season or that we're looking at a lackluster hive. The pattern itself is reasonably full, although it could definitely be fuller. The inset on the right shows mainly open brood in the larval stage. It is during these six days prior to capping that the "nurse bees" feed the larvae, so there is likely a higher proportion of nurse bees on this frame. As is typical, the brood area is mostly surrounded by cells of pollen. To the left of the brood there is some honey that has yet to be capped. If it were still very thin, it might still be called nectar. Along the top edge of the frame is a thin area of capped honey.

4b. This is a brood frame. The majority of it is capped brood, which is the pupal stage of the bee. After being capped for about 12 days, they will emerge as adults. This frame shows a much better brood pattern than the previous frames. The center of the frame is almost completely filled up with brood and there are very few empty cells. This is a sign of a good queen. In the bottom center of the frame is some younger larvae not yet capped, and on the left is pollen and uncapped nectar. In the top left corner is a small area of capped honey.

5a. This is an older brood frame. The center picture shows completely developed adult bees emerging from their capped cells. They chew the capping and then crawl out and begin working immediately. Around the outer edges is stored pollen and nectar.

### 5b. Small Hive Beetle (*Aethina tumida*)

One of the many pests of the beehive. An adult beetle is about the size of the lady beetle, it is uniform in color ranging from light brown to black. They are slightly elongated and have club shaped antennae and a shield shaped thorax. They are capable of flight and can spread easily from hive to hive. Small numbers of beetles in a strong, healthy hive are fairly benign, but if the colony of bees becomes weakened, then the beetles can cause problems (See 6a).

### 6a. Small Hive Beetle Larvae

It is the larval form of the small hive beetle (SHB) that causes problems in the beehive. The adults lay masses of eggs inside the hive. The eggs hatch after 24 hours and the developing larvae feed on the stored honey, pollen, and bee larvae. The SHB larvae appear white and worm-



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Infected larvae appear brownish and runny and often have a foul odor. A good test is to insert a small stick in a suspected cell directly into the brown liquid, and pull it out slowly. An elastic like substance remaining attached to the stick when pulled out, forming a string, indicates AFB (See 8b). If available, contact your apiary inspection service immediately. There is no cure.

8b. The rope test is used to identify AFB. After inserting a small stick the size of a toothpick and removing it, if the brown substance remains attached and forms a rope between the stick and the cell, this is an indication that AFB is present. This frame also demonstrates other symptoms associated with AFB, such as the spotty brood pattern and the perforated cappings.

\*Special thanks to Jennifer Keller and the NC State University bee lab for writing almost all of these descriptions.

## The Buzz on Honey

- ⊕ Honey has been used by people for more than 10,000 years for nutritional and medicinal purposes.
- ⊕ Honey is sweeter than table sugar, so you can use less of it.



- ⊕ Avoid adding extremely hot water to honey. It reduces honey's aroma and flavor, and destroys the natural enzymes present.
- ⊕ Honey absorbs moisture from the air when left open, leading to fermentation, so it is best kept in a closed container.
- ⊕ Honey comes in liquid and cream forms.
- ⊕ The quality and nutritional value of honey are not affected by crystallization.
- ⊕ Honey is a healthier choice than artificial sugar.
- ⊕ Honey is cholesterol and fat free.
- ⊕ Honey is a great immune system builder.
- ⊕ Honey is a natural remedy for many ailments.

Georgia's agricultural productivity is directly related to the health of honey bees, since more than ninety food, fiber, and seed crops rely on honey bees for pollination. Many specialty crops, such as watermelons, peaches, and strawberries, are heavily dependent upon honey bees for pollination. You can help provide the nectar and pollen that foraging bees need by planting a variety of flowering trees, shrubs, groundcovers, and flowers. Help Georgia's beekeeping industry thrive by purchasing honey directly from your local beekeeper or farmers market.

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**Cherokee**  
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Wally Bee's Honey  
Wally & Lynn Batchelor  
Newnan, GA  
wallybees@yahoo.com  
770-328-3472

**Decatur**  
Plumley Apiary  
Shorty Plumley  
Climax, GA  
plumleyapiary@msn.com  
229-248-0424

**DeKalb**  
Hodges Honey  
Mike & Cindy Hodges  
Dunwoody, GA  
dunwoodyhoney@bellsouth.net  
770-394-5051

**Douglas**  
Sweetwater Creek Honey Farm  
Allen Bradd  
Douglasville, GA  
allen-bradd@sweetwatercreekhoneyfarm.com  
770-310-3733

**Fulton**  
Wildwood Forrest Honey  
Mike Elliott  
Alpharetta, GA  
michael.elliott@comcast.net  
770-442-9803

Moss Rock Honeybee Farm  
Trina Barron  
Milton, GA  
www.mossrockhoney.com  
770-861-7784

**Gwinnett**  
Dances With Bees  
Jay Parsons  
Norcross, GA  
thehoneyman@att.net  
404-379-7621

**Habersham**  
Mtn Honey  
Virginia & Carl Webb  
Clarksville, GA  
MtnHoney@windstream.net  
706-754-7062

**Hancock**  
Morgan Apiaries  
Bruce Morgan  
Sparta, GA  
rbmorgan@hughes.net  
706-444-7118

**Irwin**  
H&L Bee Farm  
Terry Hester  
Ocilla, GA  
queenbreeder@aol.com  
229-468-7660

**Jackson**  
Blue Sky Honey  
Bobby Chaisson  
Jefferson, GA  
blueskyhoney@windstream.net  
706-215-6724

**Lamar**  
Cheryl Idol  
Barnesville, GA  
idolc@bellsouth.net  
404-660-2836

Brutz English  
Barnesville, GA  
brutzenglish@gmail.com  
770-843-2110

**Madison**  
Covenant Valley Farms  
Nolan & Annie Kennedy  
Colbert, GA  
kennedy07@windstream.net  
706-206-7105

Booger Hill Bee Company  
Dan Harrie  
Danielsville, GA  
dan@boogehillbee.com  
706-255-4770

**Muscogee**  
Honey Acres  
Duane Johnson  
Upatot, GA  
706-563-3716

**Oconee**  
Honey From The Bees  
Cindy Bee  
Bogart, GA  
beejourney2010@gmail.com  
770-490-9867



**Pike**  
Hidden Springs Farm  
Donna Lopez  
Williamson, GA  
mail@hssfarm.com  
770-468-3750

**Putnam**  
Rock Hill Honey Farm  
Keith & Rose Anne Fielder  
Eatonton, GA  
rad243@hotmail.com

**Rabun**  
Blue Ridge Honey Company  
Bob Binnie  
Lakemont, GA  
bobbinie@blueridgehoneycompany.com  
706-782-6722

**Towns**  
Henson Cove Apiaries  
Robert Brewer  
Hiawassee, GA  
rbrewer@uga.edu  
706-896-5249

**Troup**  
Sleepy Hollow Farms  
Terry Williamson  
West Point, GA  
twilliamson5422@yahoo.com  
706-302-8886

**Upson**  
Mike Greene  
Thomaston, GA  
mikegreenenew@gmail.com  
770-468-8818

**Walker**  
J.B. Lemons  
3617 Chamberlain Rd  
LaFayette, GA  
706-638-1885

**Walton**  
Georgia Bee Removal  
Bill Owens  
Monroe, GA  
bowens@GaBeeRemoval.com  
404-516-1807



Backyard conservation class at NRC Workshop



Taste Testing at GACDS Annual Meeting



Atha Road Elementary School demonstration garden



Lamar/Towaliga SWCD Field Day



Future GACDS educational center site demonstration garden



Southside Elementary School demonstration garden

**2010 DISTRICT CHAIRPERSONS OF  
GEORGIA SOIL & WATER CONSERVATION DISTRICTS**

Alapaha .....	Owen C. Prince, Lake Park
Altamaha .....	Travis Cook, McRae
Blue Ridge Mountain.....	John Kay, Young Harris
Brier Creek .....	P. Austin Rhoney, Wadley
Broad River .....	Herman Wheatley, Washington
Catoosa County .....	Roger Bowman, Ringgold
Central Georgia.....	Nick Holton, Wrightsville
Clayton County.....	Vacal D. Caldwell, Ellenwood
Coastal .....	M. L. Coffey, Fleming
Cobb County .....	Woody Snell, Marietta
Columbia County.....	Rick Crawford, Jr., Martinez
Coosa River.....	Charles Rutland, Powder Springs
DeKalb County .....	Dell MacGregor, Atlanta
Flint River .....	Marty McLendon, Leary
Fulton County .....	Alan Toney, Sandy Springs
Gwinnett County.....	Mark S. Brock, Lawrenceville
Hall County.....	Mike R. Haynes, Gainesville
Henry County .....	James D. Almand, McDonough
Lamar County.....	Paul Wallace, Yatesville
Limestone Valley .....	Mark Holden, Ellijay
Lincoln County.....	T. Olin Reed, Lincolnton
Lower Chattahoochee. River.....	Art Johns, Dawson
McDuffie County.....	Carroll C. Burton, Thomson
Middle South Georgia .....	Kyle Phillips, Fitzgerald
Ocmulgee River.....	Jimmy Moncrief, Roberta
Oconee River .....	David Jackson, Winder
Ogeechee River .....	Fred G. Blicht, Jr., Statesboro
Ochoopee River .....	Jim L. Gillis, Jr., Soperton
Piedmont .....	Patrick H. Hardy, Madison
Pine Mountain .....	Sam T. Rigdon, Sr., Buena Vista
Rockdale County.....	Ken Fonda, Conyers
Roosevelt .....	Joel Keith, Hogansville
Satilla River .....	Kenneth Bennett, Blackshear
Stephens County.....	Roger Sheppard, Toccoa
Towaliga .....	Barry Peters, Forsyth
Upper Chattahoochee. River.....	Edsel R. Nix, Cleveland
Upper Ocmulgee River.....	Phillip Standard, Covington
Walton County.....	Dan Bennett, Good Hope
Warren County .....	Joe Shurley, Warrenton
West Georgia .....	Mac Abercrombie, Jr., Douglasville

**2010 GACDS OFFICERS**

President .....	David Jackson, Oconee River
Vice-President .....	Danny Hogan, Central Georgia
Secretary-Treasurer .....	Marty McLendon, Flint River
Immediate Past President.....	Dennis Brown, Broad River
NACD Board Member.....	H. B. "Pete" Waller, Coastal

**EX OFFICIO MEMBERS**

GSWCC Executive Director .....	Brent Dykes
GSWCC Deputy Executive Director.....	Dave Eigenberg
NRCS State Conservationist .....	James E. Tillman, Sr.

**GROUP VICE-PRESIDENTS**

Group I .....	Roger Bowman, Catoosa County
Group II .....	Dennis Brown, Broad River
Group III .....	Ellis Lamme, Gwinnett County
Group IV.....	Marty McLendon, Flint River
Group V.....	Art Rider, Brier Creek

**ALTERNATE GROUP VICE-PRESIDENTS**

Group I .....	Jewell Tuck, Coosa River
Group II .....	Gene Anderson, Hall County
Group III .....	Pat Hardy, Piedmont
Group IV.....	Larry Dillard, Pine Mountain
Group V.....	Travis Cook, Altamaha

## CONSERVATION PARTNERSHIP

### STATE SOIL & WATER CONSERVATION COMMISSION

#### COMMISSION BOARD

Garland Thompson, Chairman .....Altamaha  
Steve Singletary, Vice-Chairman .....Flint River  
Carl Brack ..... West Georgia  
Dennis Brown ..... Broad River  
David Hays ..... Upper Ocmulgee River

#### EXECUTIVE DIRECTOR

Brent Dykes

#### DEPUTY EXECUTIVE DIRECTOR

Dave Eigenberg

#### REGIONAL REPRESENTATIVES

John Loughridge, Rome .....Region I  
Robert Amos, Athens .....Region II  
Russell Tinning, Conyers .....Region III  
Keegan Malone, Milledgeville .....Region IV  
Luke Crosson, Dawson .....Region V  
Rahn Milligan, Statesboro .....Region VI

## PAST GACDS PRESIDENTS

*\*Active District Supervisor*

1977 Jimmy S. Johnson ..... Jefferson (Deceased)  
1978 Ralph J. Balkcom ..... Blakely (Deceased)  
1979 Bill T. Brown ..... Newnan (Deceased)  
1980 Roy J. Chappell ..... Dublin (Deceased)  
1981 Jimmy E. Mayers ..... Baxley  
1982 G. B. Pollard, Jr. .... Appling  
1983 G. B. Pollard, Jr. .... Appling  
1984 Ralph Gainey ..... Cairo (Deceased)  
1985 Abe T. Minchew, Jr. .... Axson (Deceased)  
\* 1986 Willard Kimsey ..... Toccoa  
\* 1987 Willard Kimsey ..... Toccoa  
\* 1988 Steve Singletary ..... Blakely  
1989 E. T. Mullis ..... Statesboro (Deceased)  
\* 1990 T. Larry Nix ..... Gainesville  
1991 H. Joe Nichols ..... Albany (Deceased)  
1992 H. Joe Nichols ..... Albany (Deceased)  
\* 1993 Frank J. Jordan, Jr. .... Talbotton  
\* 1994 Jeanette Jamieson ..... Toccoa  
\* 1995 Mable Brown ..... Jasper  
\* 1996 John H. Redding ..... Monroe  
\* 1997 Sam T. Rigdon ..... Buena Vista  
\* 1998 Ralph A. Harrington ..... Milledgeville  
\* 1999 Ralph A. Harrington ..... Milledgeville  
\* 2000 Carl Brack ..... Carrollton  
\* 2001 Carl Brack ..... Carrollton  
\* 2002 Larry Eley ..... White Plains  
\* 2003 Larry Eley ..... White Plains  
\* 2004 Horace B. "Pete" Waller ..... Bloomingdale  
\* 2005 Jim Ham ..... Smarr  
\* 2006 Jim Ham ..... Smarr  
\* 2007 Jim Ham ..... Smarr  
\* 2008 Dennis Brown ..... Commerce  
\* 2009 Dennis Brown ..... Commerce

## PAST GACDS PRESIDENTS

*\*Active District Supervisor*

1944	W. H. Holsenbeck	Winder (Deceased)
* 1945	Jim L. Gillis, Jr.	Soperton
1946	A. C. Richardson	Montezuma (Deceased)
1947	R. H. Gregory	Chatsworth (Deceased)
1948	George B. Mock	Albany (Deceased)
1949	W. F. Hall	Sparta (Deceased)
1950	W. F. Hall	Sparta (Deceased)
1951	Houser Davidson	Fort Valley (Deceased)
1952	Raymond C. Singletary	Blakely
1953	J. Marvin Strickland	Waycross (Deceased)
1954	R. D. Tisinger	Carrollton (Deceased)
1955	George F. Powers	Milledgeville (Deceased)
1956	B. Fred Statham	Americus (Deceased)
1957	J. L. McGarity	Monroe (Deceased)
1958	J. M. Hardy	Sycamore (Deceased)
1959	Tom C. Scott	Forsyth
1960	Joe K. Hawkins	LaGrange (Deceased)
1961	David H. Kistner	Snellville (Deceased)
1962	J. Harold Haygood	Macon
1963	Douglas E. Morrison	Trenton (Deceased)
1964	Ben Overstreet	Dawsonville
1965	George W. Darden, Jr.	Mitchell (Deceased)
1966	J. T. Mayfield	Cairo (Deceased)
1967	James Loughridge	Chatsworth (Deceased)
1968	Miller A. Dial	Walnut Grove (Deceased)
1969	George C. Martin	Ellabell (Deceased)
1970	Frank O. Crawford	Rockmart
1971	David L. Firor	Athens (Deceased)
1972	Frank O. Crawford	Rockmart
1973	John Rigdon	Columbus (Deceased)
1973	Roy Holtzclaw	Cumming (Deceased)
1974	Bobby C. Smith	Thomaston
1975	L. M. Moye	Lumpkin (Deceased)
1976	Paul Schumacher	Thomaston (Deceased)

## CONSERVATION PARTNERSHIP

### NATURAL RESOURCES CONSERVATION SERVICE

#### STATE CONSERVATIONIST

James E. Tillman, Sr.

#### ASSISTANT STATE CONSERVATIONISTS

Jimmy Bramblett ..... Programs  
Dot Harris ..... Operations

#### ASSISTANT STATE CONSERVATIONISTS FIELD OPERATIONS

Michael Watson, Griffin ..... Area 1  
Jack Lewis, Athens ..... Area 2  
Mary Leidner (Acting), Americus ..... Area 3  
David Ferrell, Waycross ..... Area 4

#### ADDITIONAL LEADERSHIP TEAM MEMBERS

Edward Ealy ..... State Soil Scientist  
Sharon Gipson ..... State Administrative Officer  
Jeff Holloway ..... State Conservation Engineer  
Mary Ann McQuinn ..... Public Affairs Specialist  
Maryann Trent ..... State Resource Conservationist  
Beverly Walker ..... State Conservationist Secretary

**FRIDAY - JANUARY 21, 2011**

8:00 AM GSWCC Board Meeting ..... Sloane  
 NRCS Employee Meeting ..... Scarbrough 1

9:00 AM Registration ..... Registration Booth  
 Exhibit Showcase ..... Mezzanine  
 Georgia RC&D Council Meeting ..... Vernon

9:30 AM Grant Research and Writing ..... Sloane  
*Karan Wood,  
 Council of Outdoor Learning (COOL) Grant Program*

10:30 AM Farm Bill Program Delivery Discussion ..... Scarbrough 1  
*Will Harris, White Oak Pastures  
 Herbert Hodges, Hodges Farm  
 Elliott McGann & Arianne McGinnis, Hope Grows Farm  
 Relinda Walker, Walker Organic Farms*

12:00 PM Lunch On Your Own  
 Conservation Leadership Luncheon ..... Scarbrough 2-3  
 By Invitation Only  
*Speaker: Gary Black, Commissioner of Agriculture*

1:30 PM Business Session ..... Ballrooms C-F  
 GA Soil & Water Conservation Commission  
*Brent Dykes, Executive Director*  
 Natural Resources Conservation Service  
*James E. Tillman, Sr., State Conservationist*  
 GA Resource Conservation & Development Council  
*Jeanette Jamieson, President*  
 National Association of Conservation Districts  
*Earl Garber, Second Vice President*  
 Length of Service Awards  
 2011 Budget  
 2011 Plan of Work  
 Election of Officers  
 Other Business

**2010 GACDS AUXILIARY OFFICERS**

President ..... Carol Presley, Jackson  
 Vice-President ..... Nancy Eley, White Plains  
 Secretary-Treasurer ..... Mary Grace Blackstock, Talmo  
 Chaplain ..... Hazel Stafford, Ludowici

**AUXILIARY PAST PRESIDENTS**

1954-56 ..... Mrs. C. S. Colley (Deceased)  
 1956-57 ..... Mrs. E. O. Cabaniss (Deceased)  
 1958 ..... Mrs. J. Marvin Strickland  
 1959 ..... Mrs. P. W. Cobb  
 1960-61 ..... Mrs. James C. Loughridge  
 1962-63 ..... Mrs. Joe Hawkins (Deceased)  
 1964-65 ..... Mrs. W. H. Parker (Deceased)  
 1966-67 ..... Mrs. George W. Darden, Jr. (Deceased)  
 1968-70 ..... Mrs. J. Marvin Strickland  
 1971-72 ..... Mrs. H. C. Hawkins (Deceased)  
 1973-74 ..... Mrs. Lamar Franklin  
 1974-76 ..... Mrs. Bobby C. Smith  
 1977-78 ..... Mrs. Charles Williams  
 1979 ..... Mrs. Amon Com  
 1980 ..... Mrs. L. M. Moye  
 1981-82 ..... Mrs. G. B. Pollard, Jr.  
 1983-84 ..... Mrs. K. A. Veal  
 1985-86 ..... Mrs. Fuller C. Gordon  
 1987-88 ..... Mrs. Dean LeBron O'Donald  
 1989-90 ..... Mrs. Haynes Moorhead  
 1991-92 ..... Mrs. David L. Firor  
 1993-96 ..... Mrs. Larry J. Eley  
 1997-98 ..... Mrs. Ralph J. Balkcom (Deceased)  
 1999-2000 ..... Mrs. Joe Nichols (Deceased)  
 2001-03 ..... Mrs. Rozier Wingate  
 2004-07 ..... Mrs. T. Larry Nix  
 2008 ..... Mrs. Barbara McCarthy

**SUNDAY - JANUARY 23, 2011**

Breakfast On Your Own

9:00 AM Worship and Memorial Service..... Ballrooms D-F  
*Dr. Rick Lanford, Chaplain*  
*Debra Wise, Music*

<i>In Memory</i>	
<i>James W. Dobson</i>	<i>Haynes Moorhead</i>
<i>Norman Heatherington</i>	<i>Roy Varner</i>
<i>Melvin Johnson</i>	<i>Harry Watts</i>
<i>Frank Mitchell</i>	<i>Thomas Whittle</i>

10:00 AM Grand Prize Drawing and Adjournment

**FRIDAY - JANUARY 21, 2011**

2:30 PM Open Records and Open Meetings Law..... Ballrooms C-F  
*Stefan Ritter, Senior Assistant Attorney General*

3:00 PM GACDS Auxiliary Meeting ..... Verelst

3:30 PM Exhibit Showcase & Silent Auction Preview ..... Mezzanine

4:00 PM Forestry Breakout..... Verelst  
 GA Forest Resources Assessment and Strategy  
*Frank Green, Associate Chief of Forest Management*  
*Georgia Forestry Commission*  
 Tax Issues for Forestland Owners  
*Dr. Linda Wang, National Timber Taxation Specialist*  
*USDA Forest Service*

4:00 PM Pollinator Habitat Breakout..... Percival  
 Pollinators in Peril  
*Jennifer Berry, Research Coordinator & Lab Manager*  
*UGA Honey Bee Program*  
 Using Farm Bill Programs for Pollinator Conservation  
*Keith Wooster, NRCS State Biologist*

5:30 PM Reception (Cash Bar)..... Harborside

6:00 PM Conservation Education Center Auction..... Harborside  
*Crista Carrell, GACDS Executive Director*  
*Jon Calabria, Landscape Architect & Assistant Professor,*  
*UGA College of Environment and Design*  
*Auctioneer Steve Smith, G & G Goat Sales*

7:00 PM Partnership Hall of Fame Dinner ..... Harborside  
*David Jackson, President*  
 Recognition of Hosts & Exhibitors *Danny Hogan,*  
*Vice President*  
 Hall of Fame Inductions  
*J. M. "Bob" Plemons Presented by Garland Thompson,*  
*GSWCC Chairman*  
*James W. Dobson Presented by Virginia Palmer,*  
*Blue Ridge Mountain SWCD*

9:00 PM Hospitality Room..... Room 722

**SATURDAY - JANUARY 22, 2011**

7:00 AM Hospitality Room .....Room 722

8:00 AM Registration.....Registration Booth

Exhibit Showcase..... Mezzanine

Auxiliary Craft Sale & Country Store..... Mezzanine

8:30 AM General Session..... Ballrooms C-F  
 Welcome *David Jackson, President*

Invocation *Dr. Rick Lanford, Chaplain*

Presentation of Colors *1-118 FA, 48th IBCT, Georgia Army National Guard (GA ARNG)*

Pledge of Allegiance *Tommy Houston Coastal SWCD (Long County)*

National Anthem *Hillary Usher, 4-H Clovers & Company, Effingham County 4-H*

Tax Reform, A Farm Perspective *Jon Huffmaster Georgia Farm Bureau*

9:15 AM Exhibit Showcase..... Mezzanine

9:45 AM Reconvene General Session..... Ballrooms C-F  
 NRCS Address *Dave White, USDA-NRCS Chief*

Introduction of Keynote Speaker *H. B. "Pete" Waller NACD Board Member*

Keynote Address *The Honorable Jack Kingston*

11:00 AM Herbicide Resistant Weed Control Breakout .....  
 .....Percival & Vernon  
 Palmer Amaranth Continues to Eliminate  
 Conservation Tillage - Can We Turn This Around?  
*Dr. Stanley Culpepper, Professor UGA Crop and Soil Science Department*  
 Ocmulgee River SWCD Pilot Project  
*Jimmy Bramblett, Assistant State Conservationist NRCS*

**SATURDAY - JANUARY 22, 2011**

11:00 AM Erosion and Sediment Control Breakout..... Verelst  
 The District's Role  
*Lauren Zdunczyk, Urban Program Manager GA Soil and Water Conservation Commission*  
 District Showcase - Gwinnett County  
*Ellis Lamme, Chairman Gwinnet County SWCD*

12:00 PM Close Silent Auction ..... Mezzanine

12:00 PM Awards Luncheon ..... Harborside  
 Invocation *Dr. Rick Lanford, Chaplain*

GACDS Poster Contest *Presented by Alice Champagne, Education Committee Chair*

GACDS Scholarship *Presented by Larry Nix, Hall County SWCD*

Thompson Family Scholarships *Presented by Kirby Thompson*

GACDS Auxiliary Scholarship *Presented by Karen Rogers, Auxiliary Education Committee Chair*

Superior Professional Support *Presented by James E. Tillman, Sr., NRCS State Conservationist*

Supervisor of the Year *Presented by Art Rider, Group V Vice President*

District of the Year *Presented by Linda Harris, Senior Water Resource Representative, Tennessee Valley Authority*

2:00 PM Exhibit Showcase..... Mezzanine

2:30 PM Conservation Tours .....  
 ..... Bethesda School  
 ..... Ottawa Farms

Evening On Your Own in Savannah

9:00 PM Hospitality Room .....Room 722

# POLLINATOR HABITAT WORKSHOP



**Wednesday, May 4, 2011  
10:00 a.m.-12:30 p.m.  
Barnesville Civic Center  
685 Forsyth Street**

Georgia's agricultural productivity is directly related to the health of native pollinators and honey bees. More than ninety food, fiber, and seed crops rely on pollinators for reproduction. Learn more about our native and introduced pollinators and what you can do on your farm to help improve pollinator habitat.

- Importance of Pollinators  
*Jim Quick, UGA Griffin Campus*
- Honey Bees  
*Jennifer Berry, UGA Honey Bee Lab*
- Using Farm Bill Programs to Improve Pollinator Habitat  
*Keith Wooster, NRCS State Biologist*



Lunch will be served after the program. To register for the workshop and reserve a lunch ticket, contact the Barnesville USDA-NRCS office by April 29th at 770-358-3223 ext. 3.

## Program Sponsors:

Georgia Association of Conservation District Supervisors  
Georgia Department of Agriculture  
Georgia Soil and Water Conservation Commission  
Lamar County Soil and Water Conservation District  
Natural Resources Conservation Service  
Towaliga Soil and Water Conservation District  
UGA Cooperative Extension Service  
UGA Honey Bee Lab

## 20. Children’s Museum of Atlanta – Final Performance Report

### **Project Summary:**

In January 2010, “*Eat a Georgia Rainbow*” was successfully launched to teach the value of eating Georgia grown foods to the Museum’s audience of children and families throughout the Atlanta community and beyond (this on-going project began with the 2009 SCBG award). *Eat a Georgia Rainbow* addressed two issues of concern: the growing incidence of childhood obesity and the need for healthier eating, and the environmental need to support local farmers by buying and eating locally grown foods. Research shows that when young children learn to eat a balanced, nutritious diet they keep those habits throughout their lives. Growing environmental concerns about decreasing an individual’s carbon footprint make Georgia grown fruits and vegetables even more important – and delicious!

### **Project Approach:**

Many of the Museum’s visitors were unaware of the wide range of Georgia crops that were available and where they could purchase them. *Eat a Georgia Rainbow* helped to raise this awareness. Through the program’s ongoing activities, webpage and the Museum’s Parent Resource Room, adults were able to find sources to purchase “Georgia Grown” foods.

### **Goals and Outcomes Achieved:**

The key objective of the *Eat a Georgia Rainbow* initiative was to educate children and their families by: **1)** educating children and their caregivers on the diversity of Georgia food crops; **2)** creating activities and an avenue that would show the importance of a variety of fruits and vegetables in a healthy diet; and **3)** showing the value of eating locally – helping the environment and the state’s economy.

One of our goals was to have the Museum’s collaborative partners suggest improvements, and then implement them mid-year. We did not get many suggestions from our partners; however, we did get suggestions from the Museum Evaluator. The evaluation process used was observation (such as handing out recipe cards, making the connection clearer between story and food). These were very minor, but were implemented to improve upon the overall program.

**October 2010:** Planned activities around this project, which included in-museum programming, special event days, and designing an evaluation tool for the performance measures.

**November 2010:** Program was marketed through e-campaign; created final schedule for spring.

**December 2010:** Marketing campaign was launched.

**January 2011:** Programming continued; as each 'season' changed, other activities were created.

**March - April 2011:** During this period, special events were ongoing and evaluated.

**May 2011:** In-house (museum) programming continued with color identification to help children find Georgia crops that represented a color of the rainbow.

**June 2011:** Conducted mid-year assessment and made adjustments to program based on assessment. During the summer, campers participated in the programming.

**July & August 2011:** All programming continued; a special event day was held.

**September 2011:** All programming continued accenting the fall harvest.

**October 2011:** During this month, the Museum featured fall produce.

***Activities performed were as follows:***

- a) Beginning October 3, 2010, the Museum conducted the ***"Eat a Georgia Rainbow"*** program with children and their families. Programming was seasonal –with each season featuring a different recipe. There were 50 separate ***"Eat a Georgia Rainbow"*** sessions that were presented every Sunday through October 1, 2011. Also included in the programming were ***"Georgia Fruit and Vegetable Scavenger Hunt"*** where children learned which fruits and vegetables grew in our State.
- b) **March, April & May 2010 - Strawberries and Carrots** – Children made ***"Strawberry Smoothies"*** and listened to a reading of ***The Little Mouse, the Red Ripe Strawberry, and the Big Hungry Bear*** by Don and Audrey Wood.
- c) **June, July & August 2010**– Let's do **Blueberries and Peaches** was the theme! – It was time for children to make everything 'blue' and they did. There was also a reading of ***"Blueberries for Sal"*** by Robert McCloskeyops and ***Bottoms"*** by Janet Stevens.
- d) **September, October & November 2010 - Pumpkins** – ***Pumpkins*** were an extraordinary treat for the children who were surprised at how many things could be made with pumpkins. Exciting and new, they made ***pumpkin mousse*** and had a lovely reading of ***Pumpkin, Pumpkin,*** by Jeanne Titherington.
- a) **December 2010, January and February 2011:** It was ***Spring Rolls with Cabbage and Carrots*** and a silent reading of ***The Carrot Seed,*** by Ruth Krauss.

- b) **March 2011:** *Cooking with Colors* was the feature for this month with a special guest Chef Damaul Mitchell. Children were elated to make all the colorful and healthy treats that were fun to eat! *Bombay Fruit Salad, Sushi, Whole Wheat Pasta with Sautéed Vegetables, Vegetable Crepes, Bean Salad Plate with Hummus and Chips, Island Brown Rice Stir Fry, Mixed Dried Fruit Bars and Fresh Fruit Slushies* all were a delicious treat.
- c) **Saturday, May 28, 2011:** Children and their caregivers enjoyed this wonderful treat from around the globe. The Museum had guest Chef Obi Orubele from Egbo, Nigeria. He prepared *fufu and egusi* stew with much delight. Chef Orubele explained to visitors that ‘fufu’ is a firm, steamed dumpling made from grains and African yams. In addition, children got to taste the ‘Egusi’ stew a unique stew of Nigerian origin made from special West African melon seed (egusi), spinach, herbs, and distinct tropical ingredients. **A West African cooking demonstration by a chef who used Georgia fruits and vegetables to connect the foods from the two continents.** Children were very intrigued by this cooking demonstration and more with the tasty foods.
- d) **June, July, August 2011:** The Museum tamed some **fussy eaters** with *tomato and cucumber salad*; afterwards there was a rendition of *I Will Never Not Ever Eat A Tomato*, by Lauren Child and Corina Fletcher. Children were fascinated with how good tomatoes tasted and some parents were amazed their children indulged.
- e) **September-October 2011:** Pumpkins, pumpkins and more pumpkins. Children love pumpkins, mainly for their looks, but the pumpkins were a healthy treat for museum visitors. Afterwards there was a reading *Pumpkin, Pumpkin*, by Jeanne Titherington.

***The Museum also held five special events which included:***

- a) **October 23, 2010: *Yummy Spoonfuls Organic*:** celebrating the local bounties of the Fall Season the Museum made organic sweet potato donuts and organic butternut squash soup with Yummy Spoonful’s by Agatha Achindu.
- b) **November 13, 2010: ‘Eat a Georgia Rainbow’:** Chef Damaul Mitchell was (featured) in several cooking workshops. This was a fun-filled ***culinary workshop*** where children let their imaginations run wild. Chef Mitchell created a colorful plate of fruits and vegetables of Georgia’s bountiful collection. Children were also introduced to many vegetables that weren’t so familiar to them from around the world.
- c) **September 6 & September 13, 2011: ‘Eat a Georgia Rainbow’: PodPonics (featured).** During this activity children learned all about this new-age method of farming called **PodPonics**. It uses hydroponics, which is a method of growing plants using mineral nutrient solutions in water, without soil. Children handled the plants and saw their delicate root structure through which plants absorb water and nutrients. This activity had children very excited and amazed.

The outside evaluator, Sharpe Solutions, conducted evaluations of the program through observations and surveys. The results of both showed that over 70% of parents/adult caregivers said the program provided new information for them about a Georgia fruit or vegetable. Over 80% said that the program provided them with ideas on how to incorporate more Georgia fruits and vegetables into their child's diet!

**Beneficiaries and the Impact:**

The target population for this initiative were the over 200,000 annual visitors to the Museum during the fiscal year and an additional 9,900 children reached through the existing **Connected Learning: Connected Communities** program. This population included children ages 2-8 comprised of the Museum's visitors and underserved populations reached through ongoing community outreach and educational programming.

Overall, the program performed better than expected. Our attendance was at least 15 percent higher than last year, serving a total of 3,479 children and adult caregivers. Studies show that children remember the colors of the rainbow at an early age! While they won't find a pot of gold at the end, they will find delicious, fresh and healthy food choices they will love. The **Eat a Georgia Rainbow** program is seen as an important catalyst for change in its efforts to combat childhood obesity by helping children learn more healthful eating habits.

**Lessons Learned:**

The only issue the Museum encountered was gathering Georgia fruits and vegetables from surrounding associations to work with the Children's Museum. They were somewhat unresponsive to requests for information and programming. That is why we relied on cooking demonstrations and newcomers like Podponics for our special programming. There were no other problems or delays for the programming.

The Museum plans to continue this project regularly as an **Eat a Georgia Sunday** program into the next fiscal year, 2012. The program has been highly successful and is now a part of the Museum's overall **"Growing Healthy Kids"** initiative, which is a part of our ongoing efforts to be a part of the fight against childhood obesity. Our plans are to continue this initiative; as well as seek funding to grow its programming.

**Contact Person:**

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## **21.The Center For Community Development – Sustainable small scale hydroponic and conventional row cropping of specialty vegetables for limited-resource growers in rural communities similar to and neighboring with Hancock County, Georgia – Final Performance Report**

### **PROJECT SUMMARY**

Sustainable small-scale hydroponic and conventional row cropping of specialty vegetables for limited-resource growers in rural communities was a project designed to demonstrate alternative farming methods and outcomes. The overall goal was to determine the effectiveness of fish tank water on row crop yields. If successful, it would be possible to increase yields of collard greens as a way of proving that the by-products of fish farming (fish wastes) can be utilized as fertilizer for row crops as well as tank-grown hydroponic crops. Initially slated for nine (9) trials over a period of three years, the project sought to provide an alternative, more economical approach to field production for limited-resource farmers. The project focused on evaluating alternative crops for conventional cropping and hydroponic production and their associated costs under greenhouse conditions.

Unfortunately, with the limited financial resources available through this grant (\$34,000), the completion of the project, which became much more difficult than we anticipated, became unattainable. Our optimistic forecasts for resources to be provided in-kind to the project from the local farmers' co-op and the University of Georgia's Cooperative Extension Service never materialized. Our estimates were prepared relying upon these organizations to make a major contribution to the building of our operating facilities. The project was largely unable to proceed according to the original estimates, as several unforeseen obstacles emerged and forced the project into a holding pattern. Of the original action steps, the major sticking point was in obtaining labor required to construct the hoop houses and greenhouses in which the majority of the project experiments would be conducted. There have been significant delays in getting the construction phase completed. These delays have frozen the project in place until additional resources can be found.

We did conduct a preliminary trial in an elementary school's greenhouse. The trial produced healthy and delicious collard greens yields at low volume, which does give us an indication of the possibility of success if this project was completed as planned.

### **PROJECT APPROACH**

All of the physical resources (land, equipment, plants, and the parts necessary to erect the project's buildings and related structures) are in place.

The project, conducted on approximately ¼ acre, consists of:

- (1) Greenhouse
- (4) Hoophouses and
- (8) 650-gal. Tanks
- 12 rows plus 12 troughs

57 plants per row  
 225 Fingerlings per tank (7-8 oz. each)

Listed below are the equipment and supplies we obtained in order to carry out the project:

ITEM	QUANTITY	UNIT COST	TOTAL COST
16'X96' Greenhouse	1	6,497.00	6,497.00
20'x96' Hoophouse used	4	1561.00	6,244.00
650-Gallon Tank	8	350.00	2,800.00
<b>TOTAL</b>		<b>15,541.00</b>	

Supplies

1 HP Regenerative Blower	1	727.00	727.00
½ HP Water Pump	8	309.00	2,472.00
1 FT Air Stones	80	12.00	960.00
10 FT PVC Pipe	1128 LF	In-Kind	850.00
¼ IN Soaker Hose	1200 LF	.10	In-Kind 120.00
8 Oz. Catfish	900	.80	In-Kind 720.00
3 Oz. Tilapia	900	.80	In-Kind 720.00
Fish Nets	2	31.95	In-Kind 63.90
24x48 IN. Filter Pad	8	13.25	In-Kind 106.00
Sea Shells, lbs.	800	1.125	In-Kind 900.00
Bio Balls	800	0.375	In-Kind 300.00
Lime, Ton	0.5	80.00	In-Kind 40.00

Green Sand, 40 Lb. Bags	12	20.00	In-Kind	240.00
Fertilizer, (10-10-10), 40 Lb. Bags	6	12.00	In-Kind	72.00
8 HP Tiller	1	800.00	In-Kind	800.00
Plumbing Materials, Kit	1	1,000.00	In-Kind	1,000.00
7 FT High Fencing, LF	450	1.7222	In-Kind	775.00
4"x8' Poles	90	10.00	In-Kind	900.00
6" Tall Collard Plants	1350	0.053	In-Kind	72.00
8'x24' Compost Shed	1	450.00	In-Kind	450.00
4'x10' Cooler	1	3,500.00	In-Kind	3,500
200 LB/day Ice Machine	1	2,000.00	In-Kind	2,000.00
Water Test Kit	1	193.00	In-Kind	193.00
Auto Fish Feeders	8	43.75	In-Kind	350.00
Fish Feed, LB.	100	1.50	In-Kind	150.00
Aquatic Disinfectant. LB.	10	9.80	In-Kind	98.00
Webcams	4	80.00	In-Kind	320.00
Laptop Computer	1	800.00	In-Kind	800.00

Computer Software	3,500.00	In-Kind	3,500.00	
Printer	1	400.00	In-Kind	400.00

The project experienced significant delays in getting past the construction phase and into operating phases. The delays included dry wells (a new well approximately 300 feet from the project site which required additional plumbing and trenching had to be dug), materials deliveries, communication problems (AT&T had difficulty providing broadband internet services to the farm location), and the complexity of coordinating the project; but the worst delay was attributable to the closing of the county University of Georgia Cooperative Extension Service Office because of budget cuts. Also, the owner of the location where the project was being conducted, Po Boys Fish and Veggie Farm, became severely ill and could not carry out the activities required as part of the project.

Despite the unanticipated problems and delays, the project still proceeded. The tools for success were completed--the tanks are in the ground; the collards are in their pots; and the hydroponic troughs are in their final stages of assembly--*but additional financial resources must be found in order to go ahead with the production and testing phases.* We anticipated that most of the labor involved would come from volunteer coop members and interns provided by 4-H. Unfortunately, that did not happen and additional funding will be required to complete the construction phase.

*Even in light of the delays, we have identified possible problems and their solutions in order for a future project to be successful. The results will help future limited-resource farmers make informed decisions about a variety of options from start to finish. We can add that obtaining realistic labor costs is an important factor to consider for this type of project.*

There has been a limited trial completed. A few of the program's operational goals have been achieved. The goal of building the facility is 70% complete. However, all of the resources required to achieve the measurable outcomes anticipated by the project are still in place and ready to be employed for their intended purposes. *Thus, the theory that the by-products of fish farming (fish waste) can be utilized effectively as fertilizer for row crops as well as tank grown hydroponic crops awaits further additional confirmation.*

***The preliminary trial took place at M.E. Lewis Elementary School in its greenhouse. The trial produced healthy and delicious collard green yields at low volume, indicating that the project is on the right track. From these results, the trial tends to bear out the results achieved in prototypes, hinting at more than satisfactory results. However, one trial is not enough to call the entire project a success.***

We are now searching for grants and other funding that may be available in order to complete the project as planned, or in a scaled-down configuration.

#### GOALS AND OUTCOMES ACHIEVED

The goal of this project was to increase yields of collard greens in order to prove that the by-products of fish farming can be utilized as fertilizer for row crops as well as tank-grown hydroponic crops. The yield increase was to be measured in terms of leaves per plant in collard greens. With conventional commercial fertilizers, Georgia's average yield is 125 leaves per plant.

Because there was only one preliminary trial that took place—even though it showed positive results—we cannot state for sure that we reached our goal. There needs to be more trials in order to accurately answer that question.

#### BENEFICIARIES AND HOW THEY BENEFITED

The intended beneficiaries, the limited resource farming community, now has partial confirmation of the project's anticipated benefits in that the model for localized specialty crop production we are seeking to advance still cannot at this point be considered tried and true. However, we are validating more key points in relation to the resource requirements for similar operations. There is no doubt that the most important aspect of the project, as planned, has been the construction phases. These are the most labor intensive, requiring significant manpower, the lack of which has delayed the project's entry into operational phases. The research community is benefitting from the lessons we've learned relative to the timetables and manpower requirements involved in building the facilities, which can be said at this time to be important factors in terms of economic efficiency of the overall project.

#### LESSONS LEARNED

It became evident almost immediately that constructing this project's facility with our own forces from scratch was immensely more challenging than we originally thought in our revised estimates. We learned that our original estimates of the resources required to complete the project on time were more accurate than the revised estimates produced to match available funding. Thus, \$75,000 was a much more workable estimate of project costs. In addition to that, in-kind contributions fell short due to factors outside the control of the grantee, namely the closing of UGA's Cooperative Extension Service Office in Hancock County, and termination of the County Agent. Thus, an outside organizations' operational constraints and priorities forced us to look elsewhere for support. The result was changes of plans that negatively impacted our operations and timetables. Not having the Extension Service and 4H Clubs as partners in the project, as originally thought, left us seeking help that, to date, has not been forthcoming.

#### CONTACT PERSON FOR THE PROJECT

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Po Boy Fish & Veggie Farm

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## **22. Georgia Organics – Sustainable Georgia Farms for a Sustainable Georgia Future – Final Performance Report**

### **Project Summary:**

Georgia Organics was the proud recipient of a \$15,000 grant funded by the 2010 Specialty Crop Block Grant to improve the competitiveness of Georgia’s burgeoning local and organic farming industry. The grant’s funds were used to host Georgia Organics 2011 conference and create podcasts of conference educational sessions.



### **Project Approach:**

Georgia Organics 14<sup>th</sup> Annual Conference was held in Savannah, Georgia and engaged the energy of the Savannah good food community hosting over 1,100, including over 676 producers, reaching a new audience in southeast Georgia with 50 percent of attendees being first-timers. The purpose of the conference was to increase the supply of locally grown, sustainably produced food by providing exceptional grower education.

The final docket of programs featured 32 educational sessions, 10 in-depth workshops, 12 farm and food tours, 86 Expo vendors. One of the highlights of the conference featured, “Grow! The Movie,” by filmmakers Owen Masterson and Christine Anthony. The premiere of this documentary exemplified the spirit of the entire conference by highlighting young and determined farmers in the state who have embraced the land to make an honest living.

### **Unique Features of the 14<sup>th</sup> Annual Conference:**

- Farmer Mixer
- GROW! The Movie premier
- Georgia Department of Agriculture Commissioner address
- First conference in Savannah
- Book signings
- Conference jam session

Specialty Crop Block Grant funds in the amount of \$15,000 were applied only to specialty crops during the production of podcasts, speaker fees and travel, venue rental and farm tour transportation. Georgia Organics provided approximately \$50,000 in cash and in-kind support for the non-specialty crop costs. Detailed recordkeeping and careful monitoring was taken in order to separate specialty crop costs from non-specialty crop costs. All of the specialty crop grant funds were used solely for the promotion of specialty crops.

### **Goals and Outcomes Achieved:**

The Conference Expo attracted over 87 vendors representing a much more diverse mix of academics, farmer-focused production products, state and federal agencies, distributors and farmers markets seeking farmers and non-profit organizations in the sustainable agriculture movement, than compared to last year's event. Also featured was a special Friday night reception for attendees and the local community in the expo hall providing greater exposure and networking opportunities for all attendees.

Through the generous support of sponsors and partners, Georgia Organics was able to offer scholarships to those who had limited-resources. In total 36 farmers, 5 county extension agents, 8 teachers and 9 students were provided full scholarships to attend the entire conference. Support also included home stays, carpools and promoting public transportation to the conference facility.

Additionally, funding from the Specialty Crop Block Grant was used to create podcasts that are available via the internet and CD for those farmers and producers unable to attend the conference due to cost of time and travel. Podcasts can be viewed on the Georgia Organics website, [www.georgiaorganics.org](http://www.georgiaorganics.org).

Topics and evaluations: 5 indicates highest rating.

- Bugs on My Veggies – 4.8
- Cover Crops as a Cultural Strategy – 4.9
- Selling A lot without Selling Out – 4.7
- Growing in Hoop Houses - 4.6
- Irrigation – 4.7
- Practical Pest Manage – 4.8
- Quality, Cuts and Yield – 4.9
- When Weeds Attack – 4.5

Another value-added resource was the development and engagement of a local Host Committee which attracted new sponsorship, enhanced attendance to the conference and strengthened community relationships with Georgia Organics.

The conference evaluation process was a comprehensive survey conducted post-event to capture quantitative and anecdotal measurements. The evaluation tool measured the overall conference and each individual workshop to obtain the best feedback possible. This data was collected and is reviewed each year and plays a large role in determining what workshops are offered at future conferences, what resources to provide to growers, and what topics to offer during training sessions between conferences. The formal evaluation survey has consistently and historically had a high return rate and because the feedback is used to shape the following year's programs, the evaluation has a history of high participation rates.

**Evaluation:**

Overall: 4.38 out of 5  
 High: Kids program, Movie, Education sessions  
 Average: Farm Tours, Exhibitor satisfaction  
 Low: Farmers Feast 3.91, Silent Auction 3.72

Below is a 6-year comparison of major conference benchmarks:

Year	Attendees	Educational Sessions	Program Evaluation Avg. (1-5, 5 is Best)	% of Attendees from outside GA
2006	325	23	4.6	10%
2007	465	22	4.8	11%
2008	700	32	4.62	16%
2009	1100	38	4.6	14%
2010	1300	40	4.63	10%
2011	1100	37	4.38	12%

**Beneficiaries:**

This educational offering affected approximately 85 farmer’s markets, 64 organic producers, 3,235 CSA shareholders and an estimated 1,100 attendees, along with Georgia residents and tourists seeking to taste what Georgia agriculture has to offer. The number of growers using the on-line resources increased to 1,550. Economic multiplier benefits impacted the local economy of Savannah by keeping tax dollars in the community and strengthening local markets.

Georgia Organics had expenditures totaling \$140,034 for the conference. **Specialty Crop Block Grant funds in the amount of \$15,000 were applied only to specialty crops during the production of podcasts, speaker fees and travel, venue rental and farm tour transportation. Additional income was received from other sponsors and registration fees to pay for non-specialty crop costs.**

**Financials:**

Revenues \$205,165  
 Expenses \$140,034  
 Net \$ 65,131

**Lessons Learned:**

In conclusion, Georgia Organics has learned there is a high demand for educational opportunities in Georgia for growers. In 2011, the conference educational content increased attendance and diversity of attendees at workshops to include more racial, geographic and agricultural backgrounds. Georgia Organics Annual Conference is the only one of its type in the southeast which provides these opportunities.

**Contact Person:**

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**23. Ross & Company, Inc. – Green Acres “Naturally Grown” Farms, Specialty Crop Fresh Fruits and Vegetables Healthy Eating Community Outreach Children’s Initiative – Final Performance Report**

**Project Summary**

The 2010 project was a continuation of the 2008, *Green Acres "Naturally Grown" Farms, Specialty Crop Fresh Fruits, and Vegetables Healthy Eating Community Outreach Children's Initiative*. Ross and Company, Inc., a 26-year-old grass roots non-profit organization based in Atlanta's empowerment zone, is dedicated to providing services, which focus on the health and welfare of children.

The introduction of this project to the community began nine years ago and the intent was to continue promoting Georgia's specialty crops by educating children in making healthy food choices, which included Georgia's locally grown "Specialty Crop" fresh fruits and vegetables.

**Project Approach**

Originally, in 2008, the pilot program targeted 50 to 100 children within three metro Atlanta counties. However, due to our raising additional funding support to add to the \$8000.00 grant award, over the past three years we have been able to include an additional 1,500 children to participate in the Specialty Crop presentations. However, even with this additional funding, hundreds of children were also turned away. Those who we were able to accommodate participated in a continuation of workshops, training sessions, and fun-filled community outreach activities, which promoted specialty crop fresh fruits and vegetables consumption. The activities included lectures, educational games, and hands-on activities, which focused on, but were not limited to the following:

- Increasing understanding of what *Specialty Crops* are, and how consumption affects an individual's physical and emotional health to evoke long-term change.

- Increasing and promoting awareness and availability of healthy fresh fruits, nuts, and vegetables at grocery outlets that accept EBT within their communities.
- Increasing awareness of food systems and the transition of fruits and vegetables from the garden or farm to the grocery store and to the table.
- Promotion of the awareness and importance of supporting locally grown, by increasing awareness and interest in knowing the process of how fresh fruit and vegetables are grown, sometimes packaged and transported hundreds, sometimes thousands of miles before arriving at grocery outlets or farmers market.
- Promotion of alternative snacks that include nuts, fresh fruits, and vegetables, (*specialty crops*) through community outreach events, which include hands-on activities such as tastings, cooking demonstrations, etc.
- Participated in hands on activities, which increased their knowledge of how plants, fruits, and vegetables (*specialty crops*) can be grown in soil and non- soil environments.
- Additional funds were used to continue distribution of seeds, distribute small gardening tools and explain their usage. This add-on program service not only assisted to further develop their skill sets, but also increased their knowledge of how to plant fruits and vegetables (*specialty crops*) in small spaces, e.g., containers, raised beds, boxes on apartment balconies and/or small yard areas.

### **Goals, and Outcomes Achieved**

A pre and post evaluation in the form of a survey was distributed to the older participants and the younger participants were assisted with their surveys.

*Pre-Surveys:* One hundred percent (100%) of the pre-evaluation surveys indicated that not only had the children and youth participants never heard of *Specialty Crops*, but also, other than our staff members, had the attending adults. In addition, despite the fact that many of our participants resided within the inner city and within walking distance of the *Georgia Department of Agriculture*, pre-surveys also indicated that neither the young participants nor most attending adults had any knowledge of its location or its role in relation to our local farmers, markets, community food systems or educational services available to them.

*Post Surveys:* Findings indicated that almost ninety-five percent (95%) are now aware of the role and location of the *Georgia Department of Agriculture*, but more importantly, they now have a better understanding of what *Specialty Crops* are, how they are grown, their growing patterns, taste, characteristics, how to plant and grow them, their nutritional value, and other important aspects as outlined in this project.

- Although the goals and objectives of the lectures and literature were met,

according to the post survey provided, the distribution of seeds, small gardening tools, containers and hands-on teaching were not only fun, but further developed their skill sets while increasing their knowledge of how plants, fruits and vegetables (*specialty crops*) can be grown in small spaces.

Because of the demographics we serve, most of our participants were vulnerable children, and at-risk youth who live within food deserts with limited access to farmers markets and traditional grocery store chain produce departments. Although we met the **goals and objectives** originally outlined and funded in the proposed application, post-survey findings indicated the additional services we were able to provide due to additional fund-raising efforts, (e.g., distributing seeds, providing small gardening tools, containers used in providing hands-on activities) were not only fun, but participants found them most effective.

### **Beneficiaries and How They Benefited**

*Green Acres "Naturally Grown" Farms, Georgia's Specialty Crop Fresh Fruits and Vegetables Healthy Eating Community Outreach Children's Initiative*, not only assisted in our effort to promote, market, and increase awareness of Georgia's Specialty Crop, but also provided an educational service in an oftentimes overlooked demographic area of vulnerable children and at-risk youth. As stated earlier, over the past three years, we have reached approximately 1,500 of these children and youth.

The continuation of this project complemented and built on work previously done by allowing us to continue providing ongoing community outreach events that are not only changing the mindset of children regarding consumption of more fruits and vegetables, but their adult caretakers and the community as a whole.

***There is another important outcome of this project. With all the recent attention on childhood obesity and its correlation to how our society is becoming more automated every second, with dietary choices less nutritionally beneficial, and with the acceptance of a sedentary lifestyle, children's physical activity, so important to their overall well-being, has been reduced drastically. Research has shown this physical activity does not have to be intense to draw benefits for the overall health of children.***

### **Lessons Learned**

Studies have shown that activities, which are considered beneficial for children's overall health, consist of outdoor activities, such as learning about *the "specialty crop"* planting, watering, and maintaining small backyard and container gardens. We feel that those who were fortunate enough to have been selected to participate in, *Green Acres "Naturally Grown" Farms, Georgia's Specialty Crop Fresh Fruits and Vegetables Healthy Eating Community Outreach Children's Initiative*, have learned lessons that are invaluable and lessons they will take with them for the rest of their lives.

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OBJECT 9

and



# Georgia Grown Brand Awareness Baseline Research Study



MARKETING  
WORKSHOP  
researchWISE™

# Background

## What is Georgia Grown?

“First and foremost, Georgia Grown is a program designed to help businesses with a vested interest in agriculture become even more successful. Our goal is to aid our agricultural economies by bringing together producers, processors, suppliers, distributors, retailers, agritourism and consumers in one powerful, statewide community.

Georgia Grown is also a brand. This brand is desired by businesses and consumers who want to buy and promote Georgia’s locally grown products. It’s a brand with deep roots in sustainability, quality and integrity.”<sup>a</sup>

Object 9 is working with the Georgia Grown to expand consumer awareness of the brand. As a step toward that goal, Object 9 has commissioned Marketing Workshop to conduct a baseline Georgia Grown brand awareness study in the State of Georgia.



<sup>a</sup> <http://georgiagrown.com/georgia-grown>

# Objectives and Methodology

The objectives of this study were to understand consumer awareness and understanding of the Georgia Grown brand prior to any significant brand promotional efforts. More specifically, this study was designed to understand:

- Overall consumer awareness and understanding of locally grown/made initiatives
- Current Consumer attitudes toward locally grown/made products
- Purchase behaviors of locally grown/made products
- Consumer willingness to pay for locally grown/made products

To achieve these objectives, Marketing Workshop completed a total of **402** online quantitative interviews with qualified consumers in the state of Georgia between September 17<sup>th</sup> and September 24<sup>th</sup>, 2012.

Respondents were screened to ensure they were:

- Georgia residents
- Ages 18 and over
- Primarily responsible or share responsibility for grocery shopping in the household

Statistical differences, at the 95% confidence level, are noted in the report.



# Summary and Recommendations

- Over three quarters of Georgia consumers indicate knowing a product is locally grown/produced while shopping is at least somewhat important to them.
- The vast majority of consumers in Georgia purchase locally grown / made products at least sometimes with fresh produce, meat, dairy products and eggs being the leading locally grown / produced products purchased.
- Not surprisingly, Georgia consumers primarily think about peaches and onions when thinking about Georgia produce.
- **There is an opportunity to grow the locally grown category by expanding beyond fresh produce (peaches / onions) and building on the local products Georgia consumers are already interested in – meat, dairy, and eggs – before expanding into non-food categories.**
- Consumers have mixed opinions on the current cost of locally grown products – some think they pay less, other think they pay the same or more.
- **If possible, the overall locally grown movement would benefit from a more consolidated pricing message – e.g. “you get better quality, but pay the same amount for locally grown products.”**



# Summary and Recommendations

- Currently, unaided awareness of the Georgia Grown initiative is at 6% among consumers in the state of Georgia, with aided awareness being at 58%.
- **The current unaided and aided awareness numbers will become a baseline for the success of the marketing for the Georgia Grown brand moving forward.**
- Consumers believe that Georgia Grown has a positive impact on Georgia economy.
- The majority of Georgia consumers believe Georgia Grown is an appropriate way to describe locally grown products for this state and although many consumers indicate they understand what the Georgia Grown mission is, it is currently more farmer / business than consumer centric.
- **There is an opportunity to expand Georgia Grown positioning to include more consumer centric benefits – i.e. Georgia Grown is good for Georgia businesses, Georgia economy and Georgia consumers.**



# Summary and Recommendations

- Georgia Grown products already have a great reputation among consumers in terms of freshness, quality, availability and price and consumer say they are more likely to purchase a product if it is labeled as Georgia Grown or made with Georgia Grown products.
- **Georgia Grown should strongly consider a program for Georgia Grown product labeling for both fresh and processed foods as the initial step in expanding brand influence. Non-food items that use Georgia Grown products could serve as a second step in expanding the brand as currently fewer consumers place importance on Georgia Grown labeling for these products.**
- Consumers already expect to pay the same as or more for Georgia Grown products. And, many are *willing* to pay more.
- **As with the overall local products, it could be beneficial to establish a common pricing perception for Georgia Grown products - do Georgia Grown products cost more/less/the same to consumers?**



# Summary and Recommendations

- Currently, older consumers are more knowledgeable about the Georgia Grown initiative and are more engaged with their purchases – more likely to seek out locally grown products.
- **However, Georgia Grown should consider a targeted campaign to Georgia consumers under the age of 35 in an effort to change their attitudes toward Georgia Grown products.**
  - Currently, these consumers are most likely to:
    - Say they rarely purchase locally grown / produced products.
    - Be unsure of the overall impact of Georgia Grown on the economy.
    - Expect Georgia Grown to be more expensive.
    - Indicate knowing a product is Georgia Grown would not have an impact on their purchase decision.
- **By engaging these consumers now, there is a potential for Georgia Grown to cultivate a relationship with the next generation of Georgia consumers.**





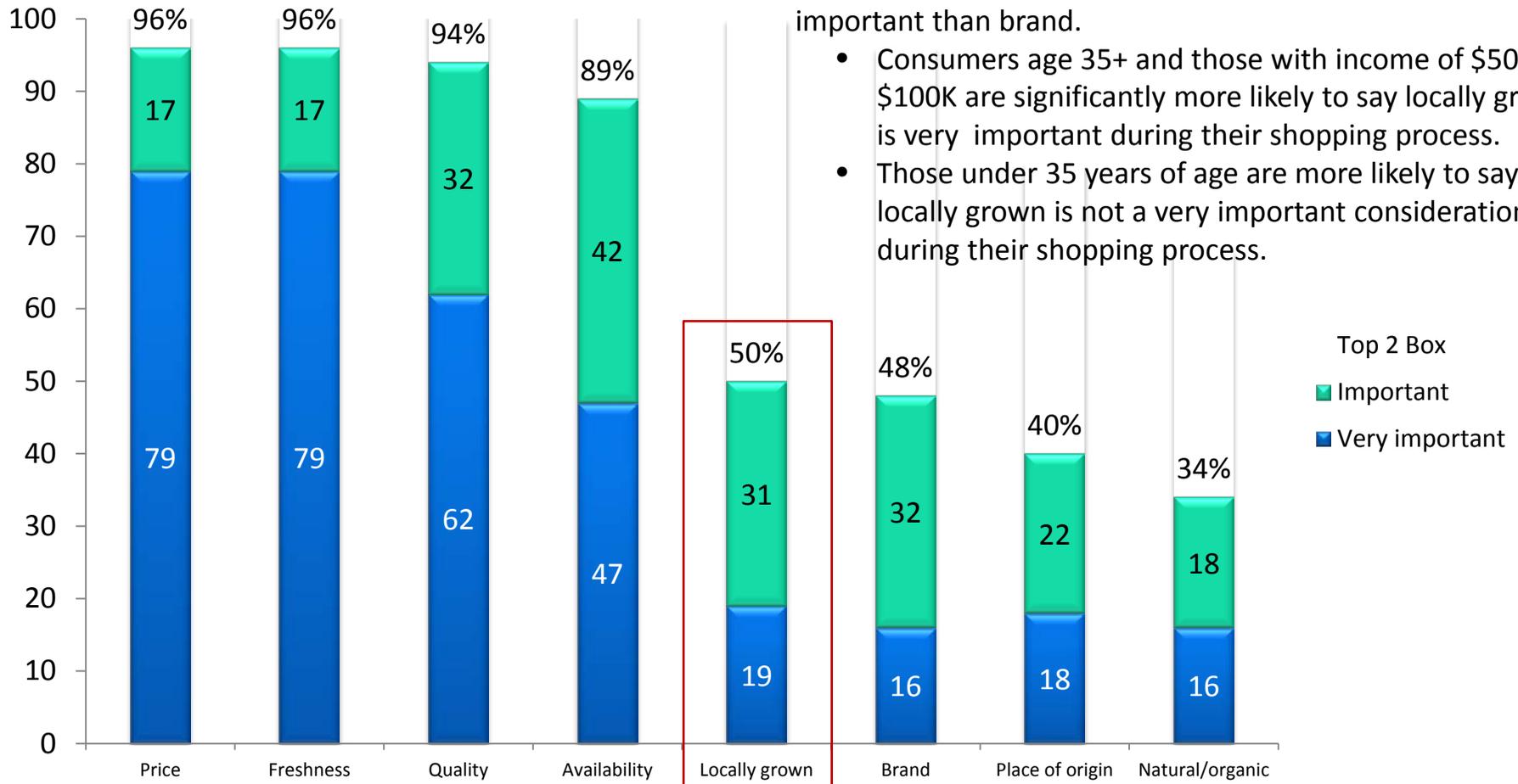
## Detailed Findings



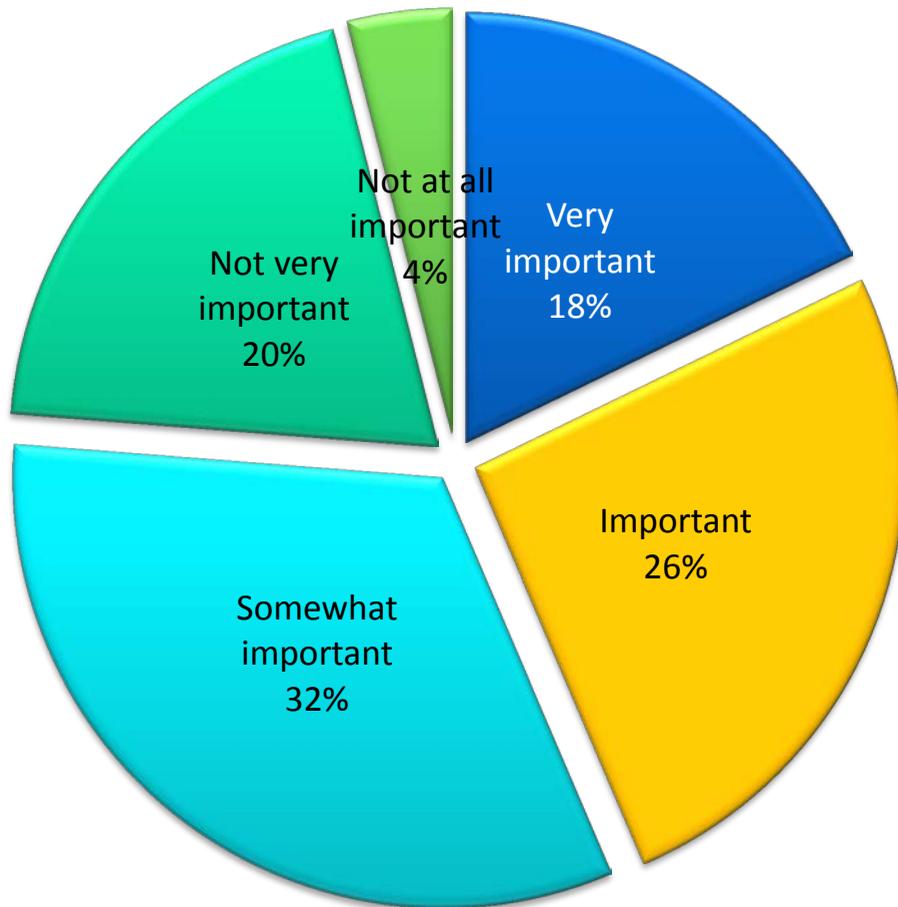
Locally Grown

# Attributes Important to Shopping Process

- Not surprisingly, price, freshness, quality and availability lead in importance during shopping considerations.
- Generally, locally grown/produced products are important to half of the consumers in Georgia – even slightly more important than brand.
  - Consumers age 35+ and those with income of \$50K-\$100K are significantly more likely to say locally grown is very important during their shopping process.
  - Those under 35 years of age are more likely to say locally grown is not a very important consideration during their shopping process.



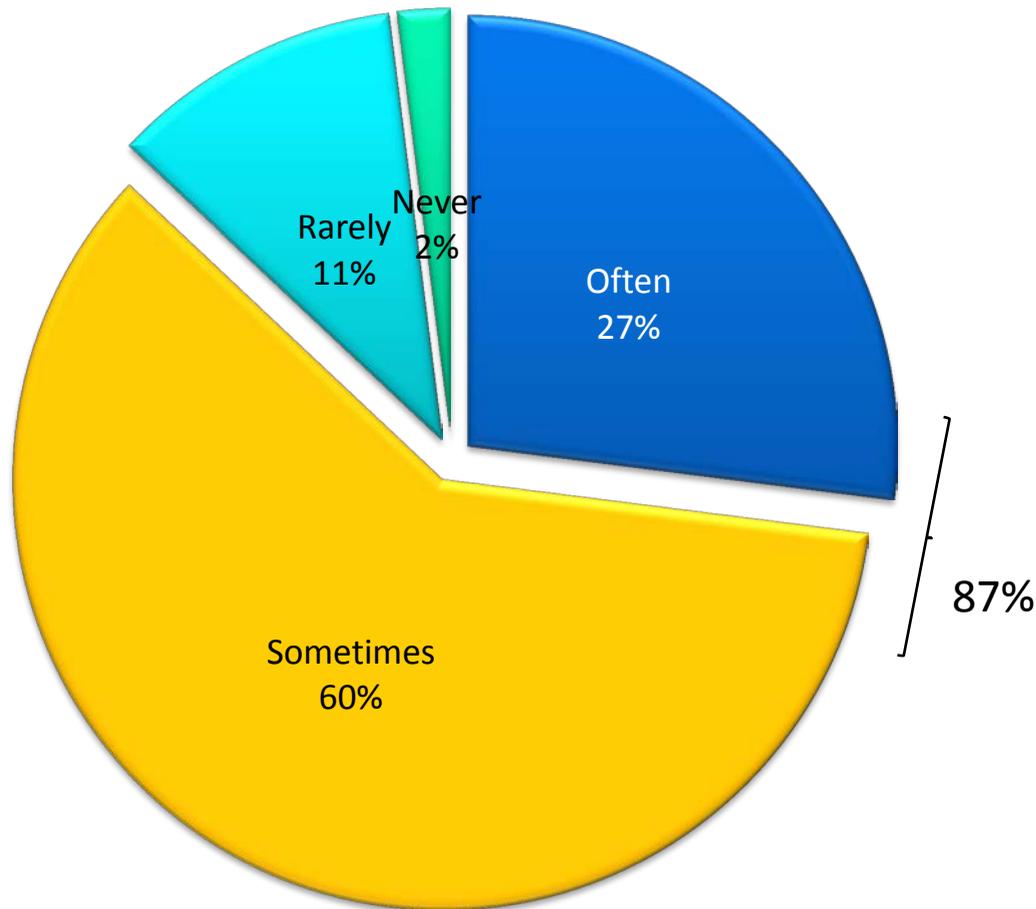
# Importance of Locally Grown Products



- When specifically probed on importance of *knowing* a product is locally grown during shopping, 76% of Georgia consumers say it is at least somewhat important.
- While almost one-quarter say it is not an important consideration for them when shopping.



# Frequency of Purchasing Locally Grown / Made Products



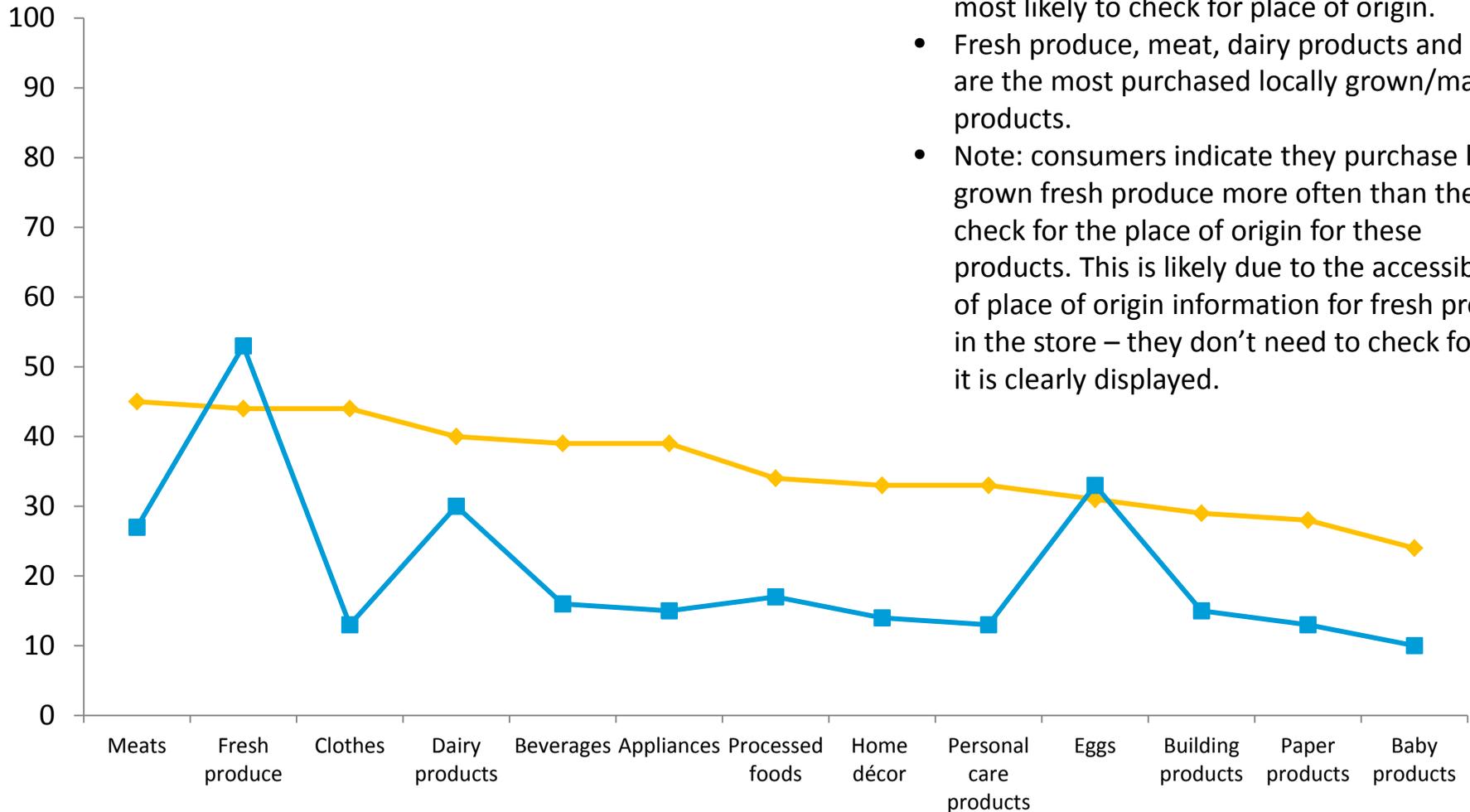
- The vast majority of consumers in Georgia purchase locally grown / made products at least sometimes.
  - Slightly over one-quarter of Georgia consumers indicated they purchase locally grown/made products often.
  - Three-in-five consumers stated they purchase these products sometimes.
- Consumers under 35 are significantly more likely to say they **rarely** purchase products that are locally grown or locally made.



# Locally Grown / Made Product Purchase

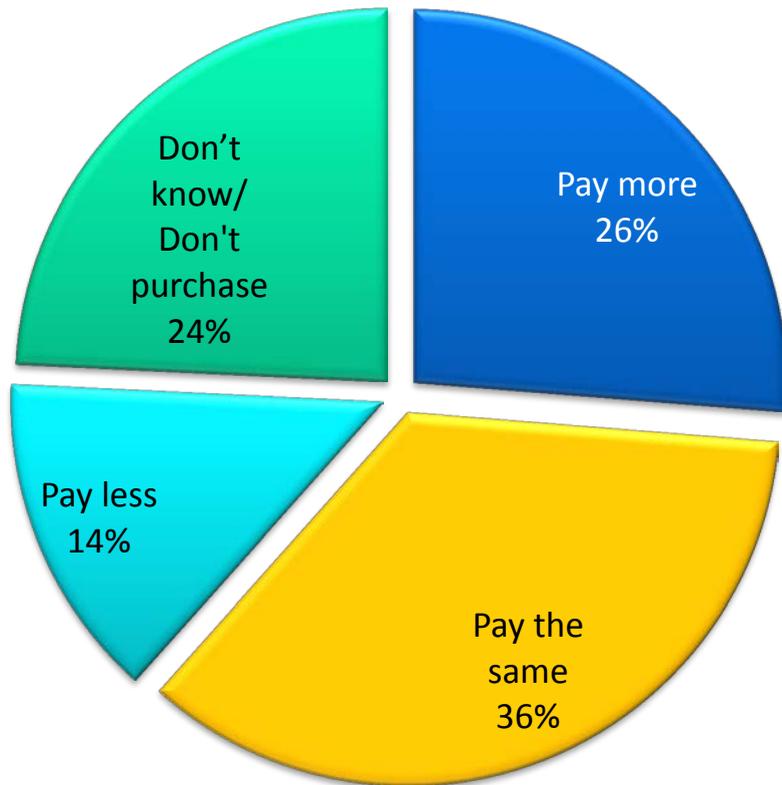
◆ Check    ■ Purchase

- Meats, fresh produce, clothes, dairy products and beverages are the products consumers are most likely to check for place of origin.
- Fresh produce, meat, dairy products and eggs are the most purchased locally grown/made products.
- Note: consumers indicate they purchase locally grown fresh produce more often than they check for the place of origin for these products. This is likely due to the accessibility of place of origin information for fresh produce in the store – they don't need to check for it if it is clearly displayed.



For each of the following products, please indicate if you check /purchase locally grown / locally made?

# Cost of Locally Grown Products



- Consumers have varied opinions about the cost of locally grown products.
  - Over one-third of Georgia consumers indicate they currently pay the same amount for locally grown products as they do for their other purchases.
  - Slightly more than one-quarter say they currently pay more for locally grown products.
  - Almost one-quarter don't know how locally grown products are priced.
- Interestingly, consumers with household income of \$50K-\$100K are significantly more likely to say they pay more for locally grown products than consumers with household income of under \$50K.
  - And, inversely, those with income of under \$50K are significantly more likely to say they pay less for locally grown products.



# Produce Association with Georgia

- Not surprisingly, Georgia consumers primarily think about peaches and onions when thinking about Georgia produce.

Onions

Strawberries

Peanuts

Peaches

Corn

Pecans

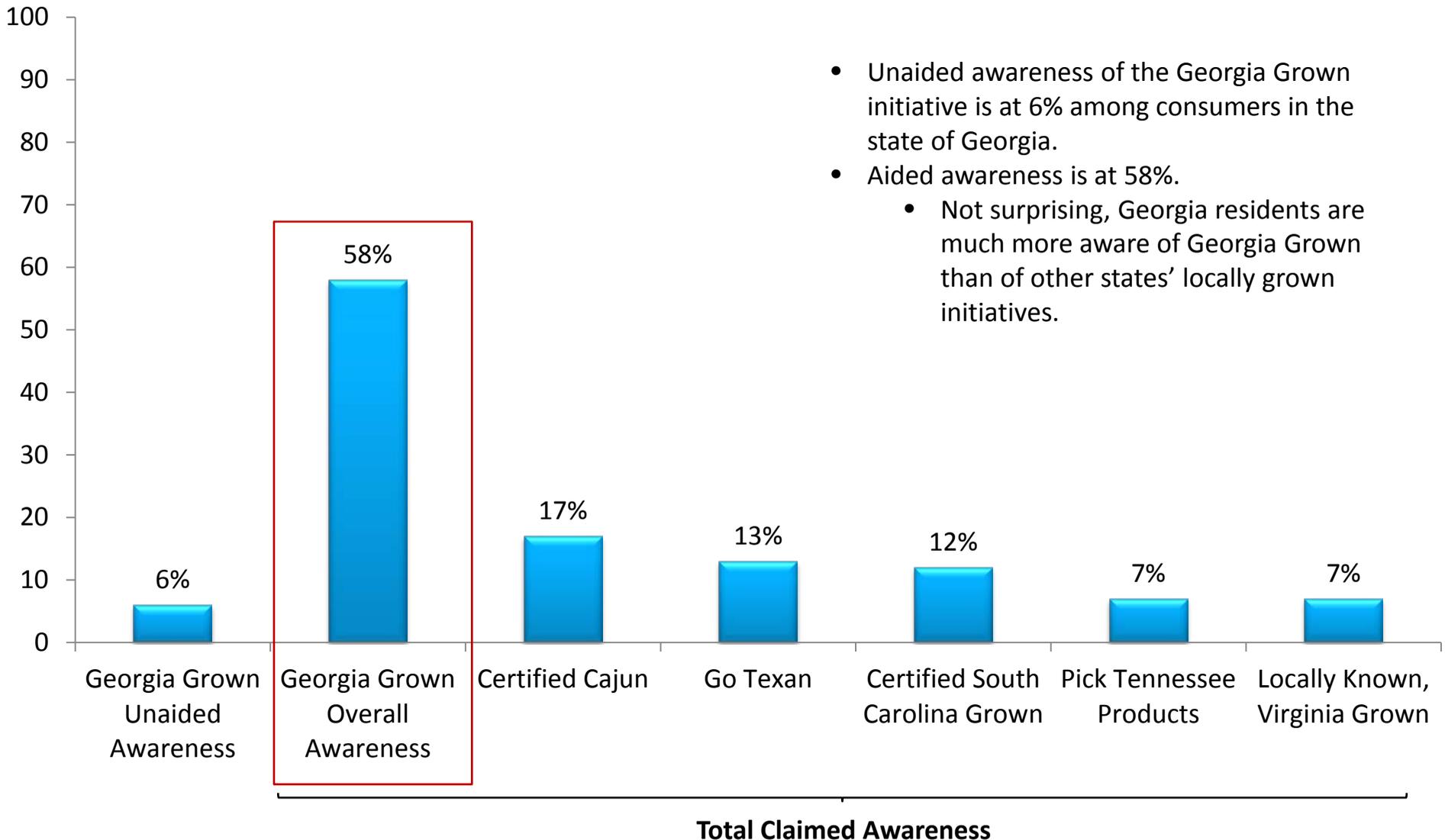




  
GEORGIA  
grown



# Awareness of GA Grown and Other Locally Grown Initiatives



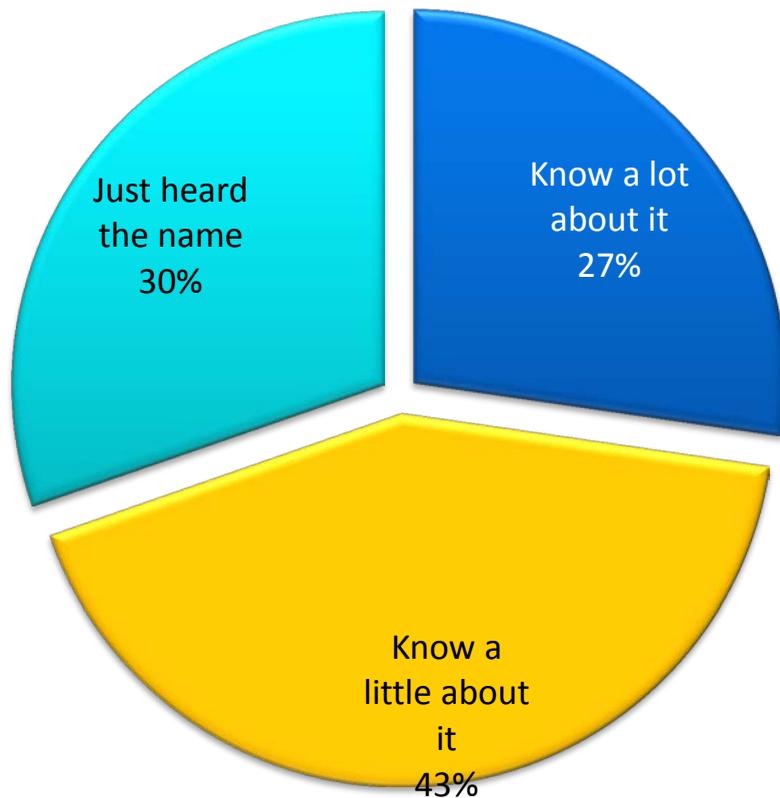
- Unaided awareness of the Georgia Grown initiative is at 6% among consumers in the state of Georgia.
- Aided awareness is at 58%.
  - Not surprising, Georgia residents are much more aware of Georgia Grown than of other states' locally grown initiatives.



# Knowledge of Georgia Grown

(among those who are aware)

**(n=273)**



- Those aware of the Georgia Grown brand have varied levels of knowledge about the initiative.
  - Slightly over one-quarter indicate they know a lot about it.
  - Two-in-five say they know a little about it.
  - Almost one-third indicate they are just aware of the name.
- Consumers with kids are significantly more likely to say they know a lot about Georgia Grown than consumers without children in the household.



# Associations with Georgia Grown

- Georgia consumers are most likely to associate Georgia Grown with fruits / vegetable / nuts, and, not surprisingly with things grown / made / raised in Georgia.

Grown in the south / locally / nearby

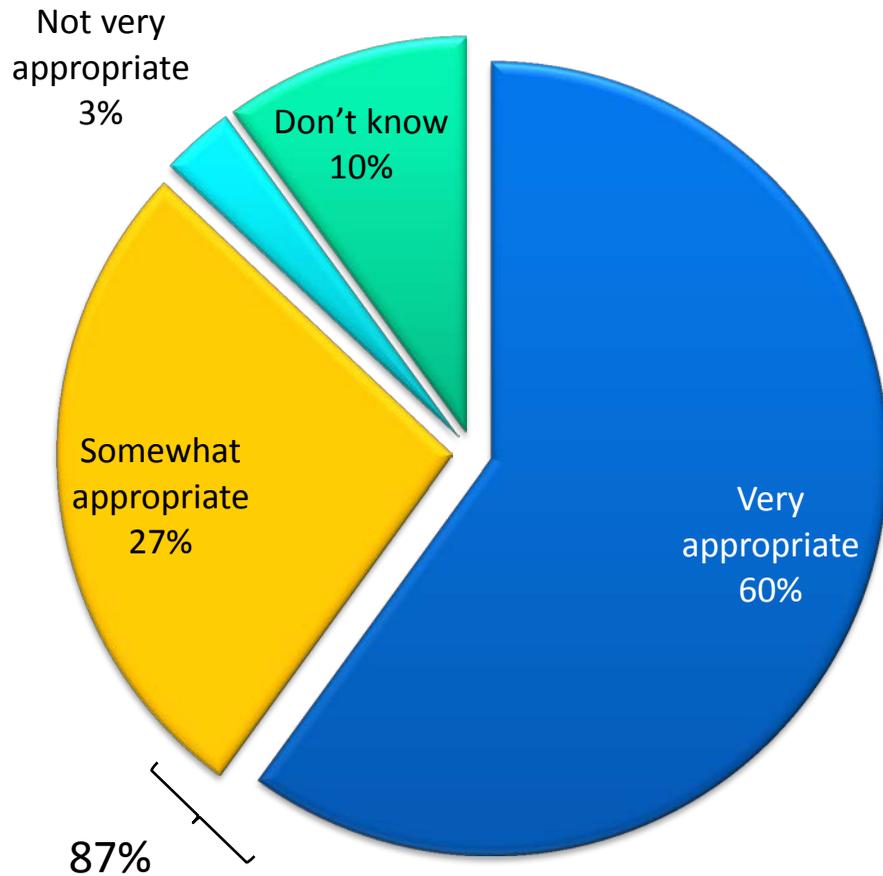
Fresh

**Produce / nuts**

**Grown / made / raised in Georgia**



# Appropriateness of the Georgia Grown Slogan



- The majority of Georgia consumers believe Georgia Grown is an appropriate way to describe local products.
- Women are significantly more likely than men to say Georgia Grown is very appropriate.



# Reason for Georgia Grown Appropriateness

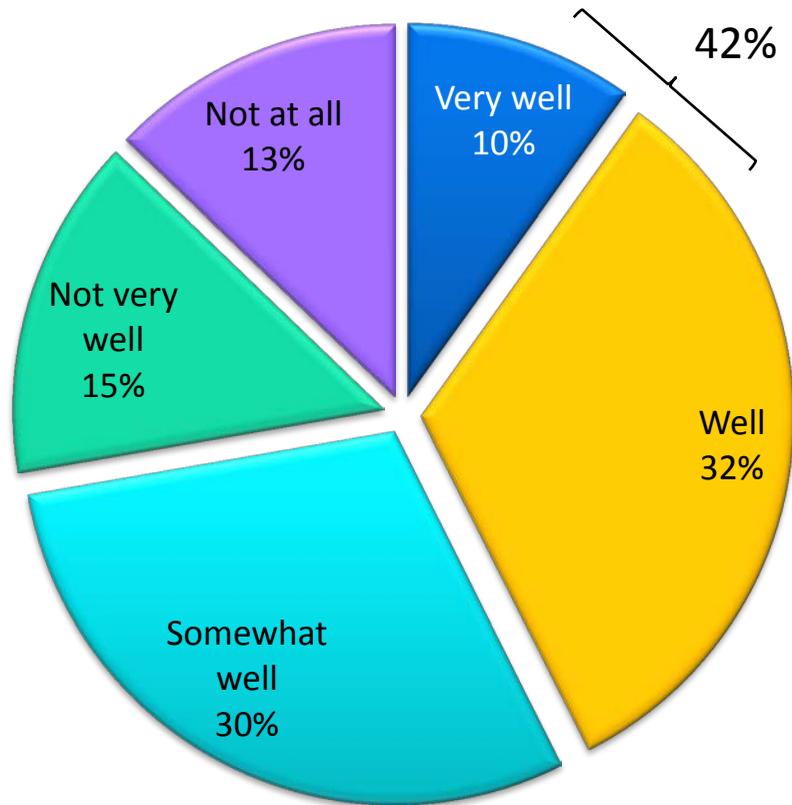
(among those who said it is very appropriate)

	Very appropriate (n=241) %
States where the products are from	22
To the point / simple / short	21
I live in Georgia	13
Promotes Georgia / items grown in Georgia	11
Catchy slogan	9
Promotes locally grown / I like buying local	7
Shows support for Georgia economy / local farmers	6
Products are fresh	5
Familiar with it	3
Georgia products are best	3
Believable / trustworthy	1

- Consumers who believe it is appropriate say it is appropriate because it states the product's place of origin and is short and to the point.
- Respondents who indicated Georgia Grown is only somewhat appropriate or not very appropriate state the negatives of the slogan are: it is too simple/not catchy, and that it is not specific enough in indicating the products it represents.



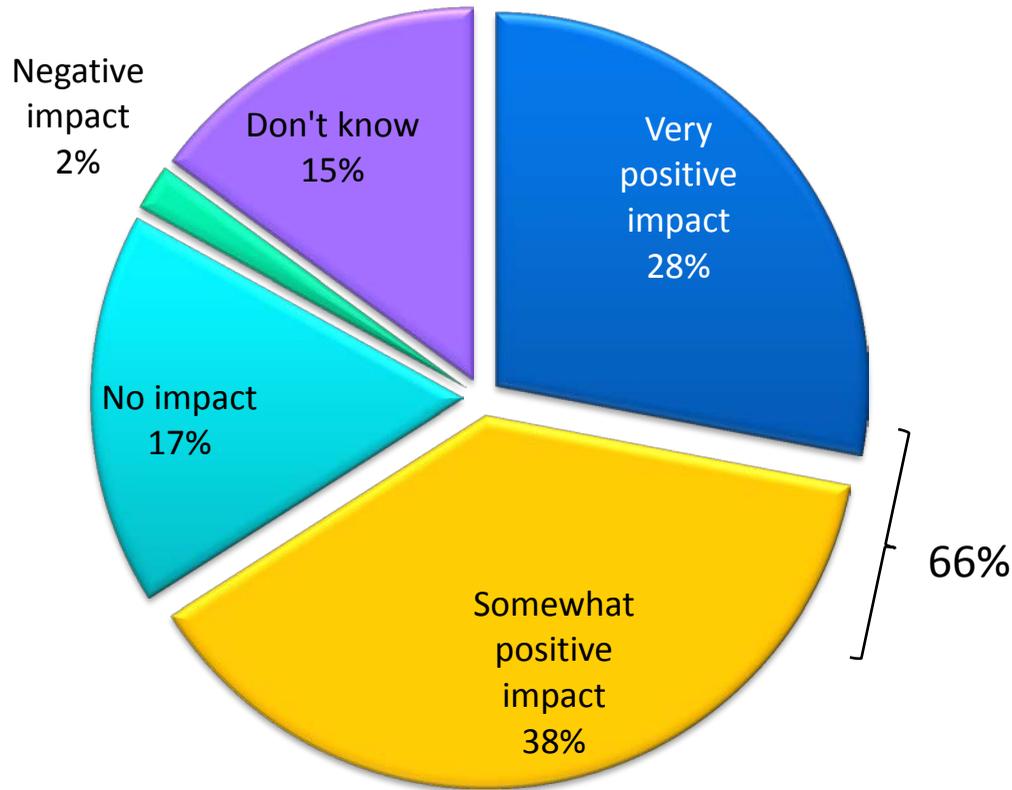
# Consumer Understanding of Georgia Grown Mission



- Two-in-five Georgia consumers indicate they understand Georgia Grown mission well.
- When asked what they think the mission is:
  - 49% of respondents indicate it is to promote local products/ get people to buy locally grown products.
  - 6% indicate it is to promote buying from local farmers to help stimulate local economy.
  - 23% indicate they don't know what the mission for Georgia Grown is.



# Perceived Impact of Georgia Grown on GA economy



- The majority of Georgia consumers believe Georgia Grown has a positive impact on Georgia economy.
- Consumers with kids are significantly more likely to say it has a very positive impact on the economy.
- Consumers under 35 years of age are more likely to be unsure if it has any impact than those ages 35-54.

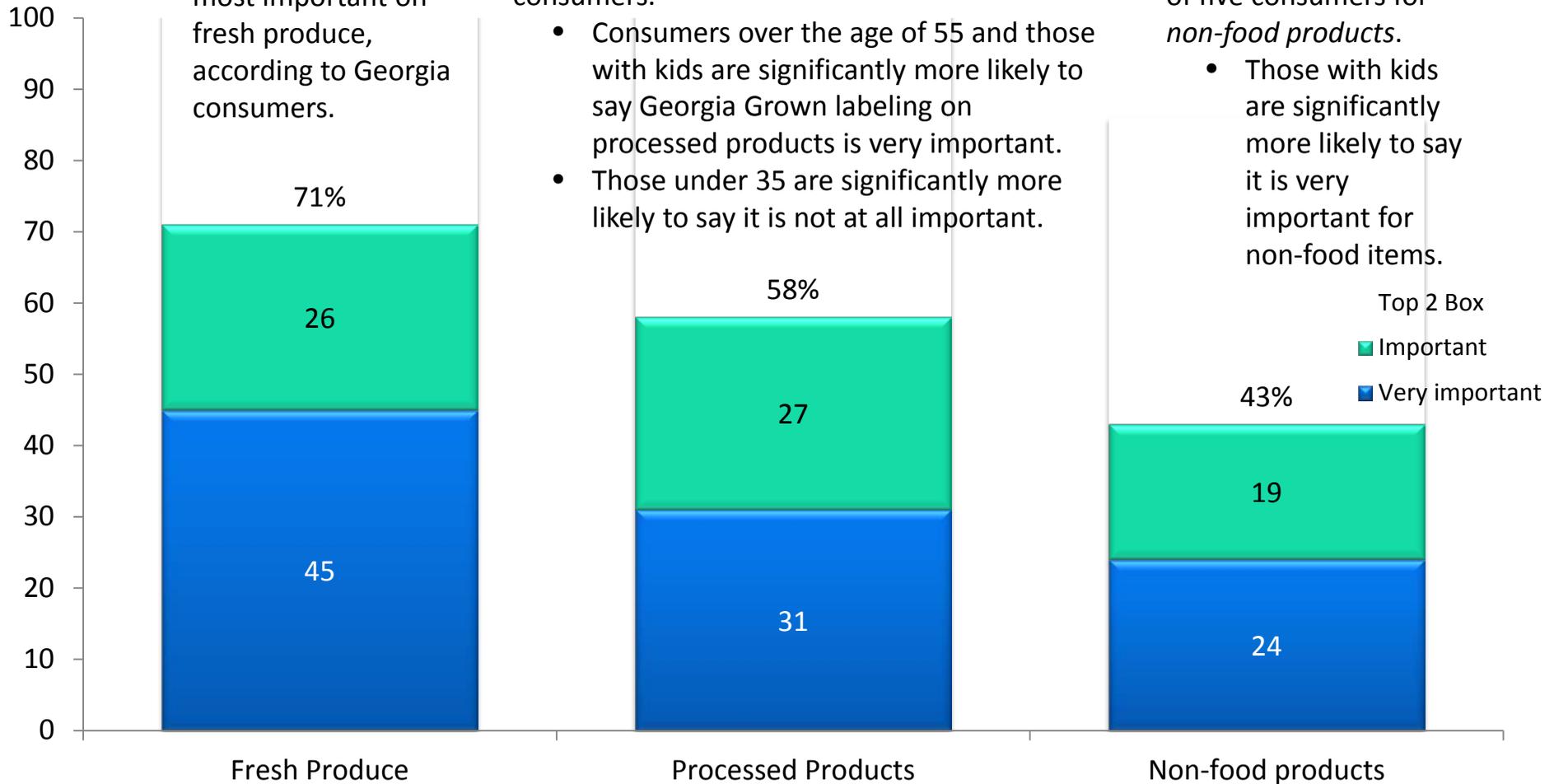


# Importance of Georgia Grown Labeling on...

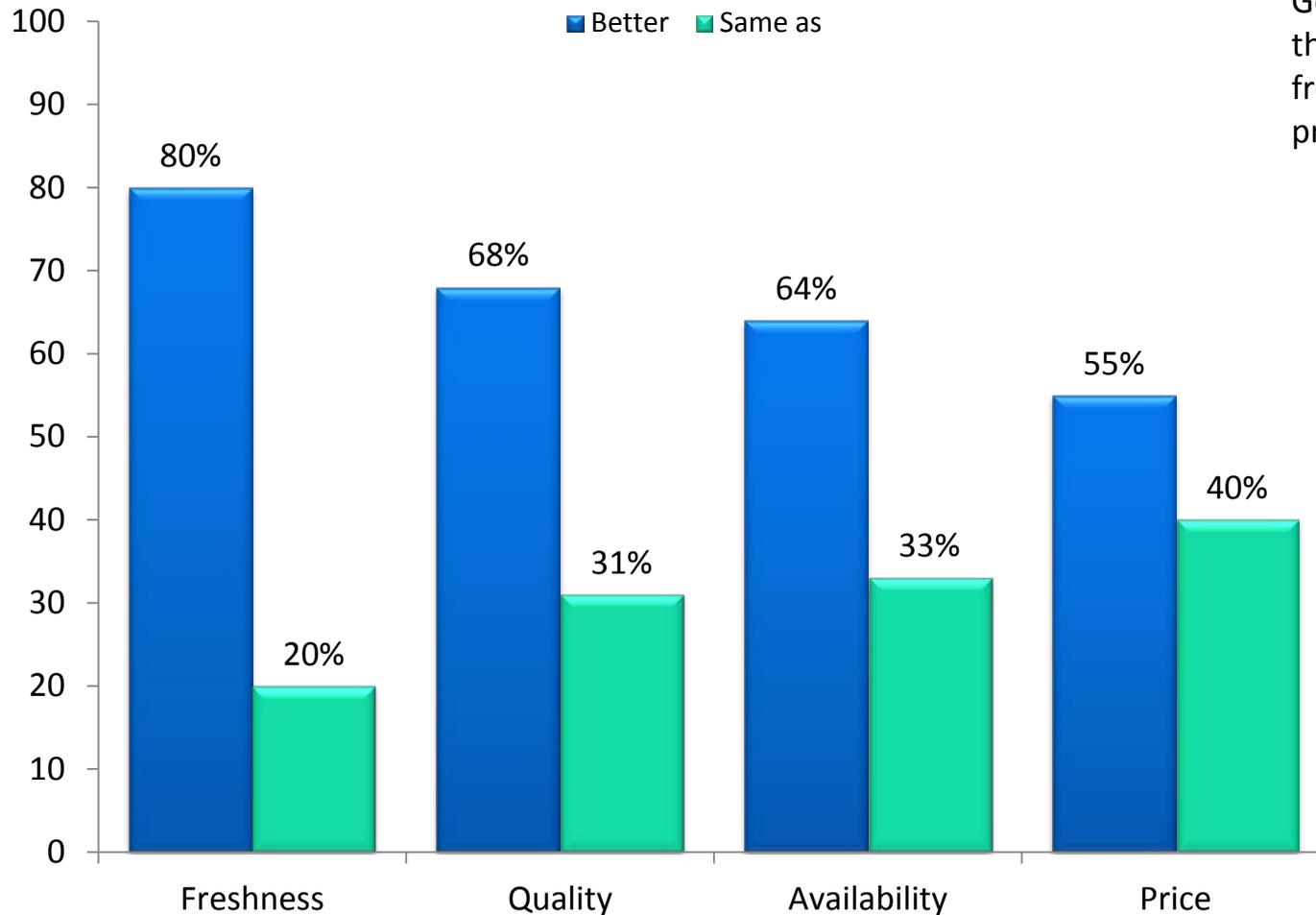
- Overall, Georgia Grown labeling is most important on fresh produce, according to Georgia consumers.

- Georgia Grown labeling is important on *processed foods* for three out of five Georgia consumers.
  - Consumers over the age of 55 and those with kids are significantly more likely to say Georgia Grown labeling on processed products is very important.
  - Those under 35 are significantly more likely to say it is not at all important.

- Georgia Grown labeling is important to two out of five consumers for *non-food products*.
  - Those with kids are significantly more likely to say it is very important for non-food items.



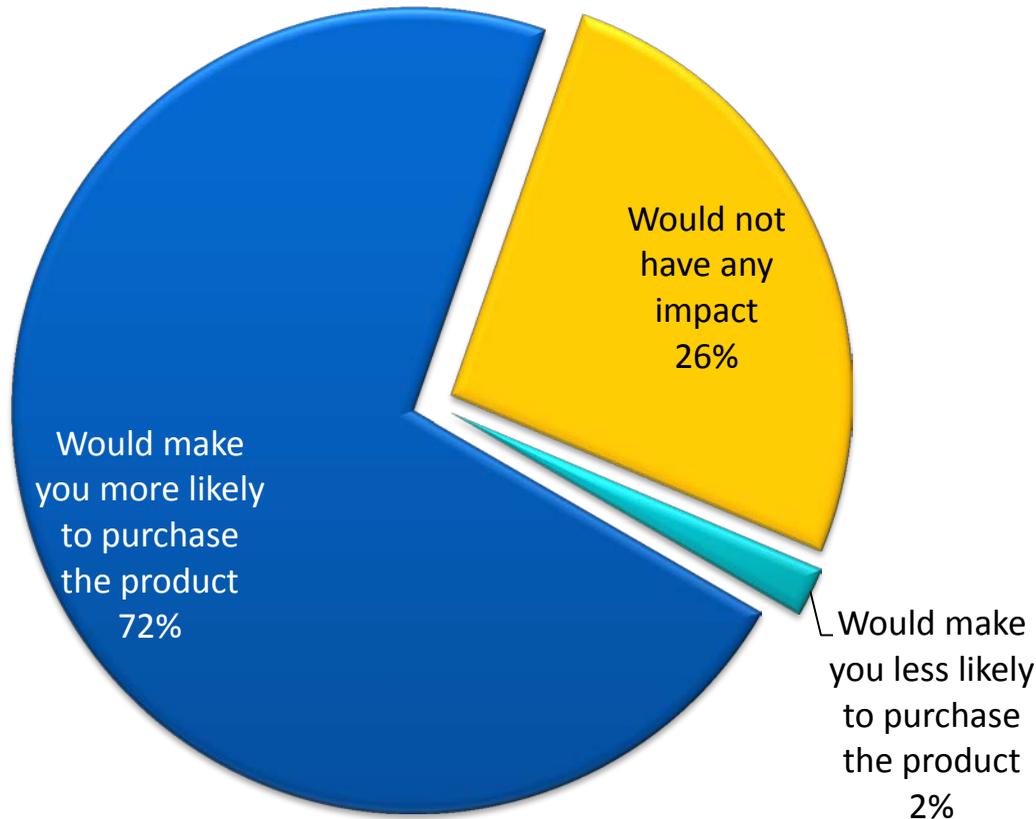
# Comparison of GA Grown Products in Terms of...



- The majority of consumers expect Georgia Grown products to be better than other products in terms of freshness, quality, availability and price.
  - Consumers over the age of 55 are significantly more likely to say they expect Georgia Grown products to be better on all of the attributes.



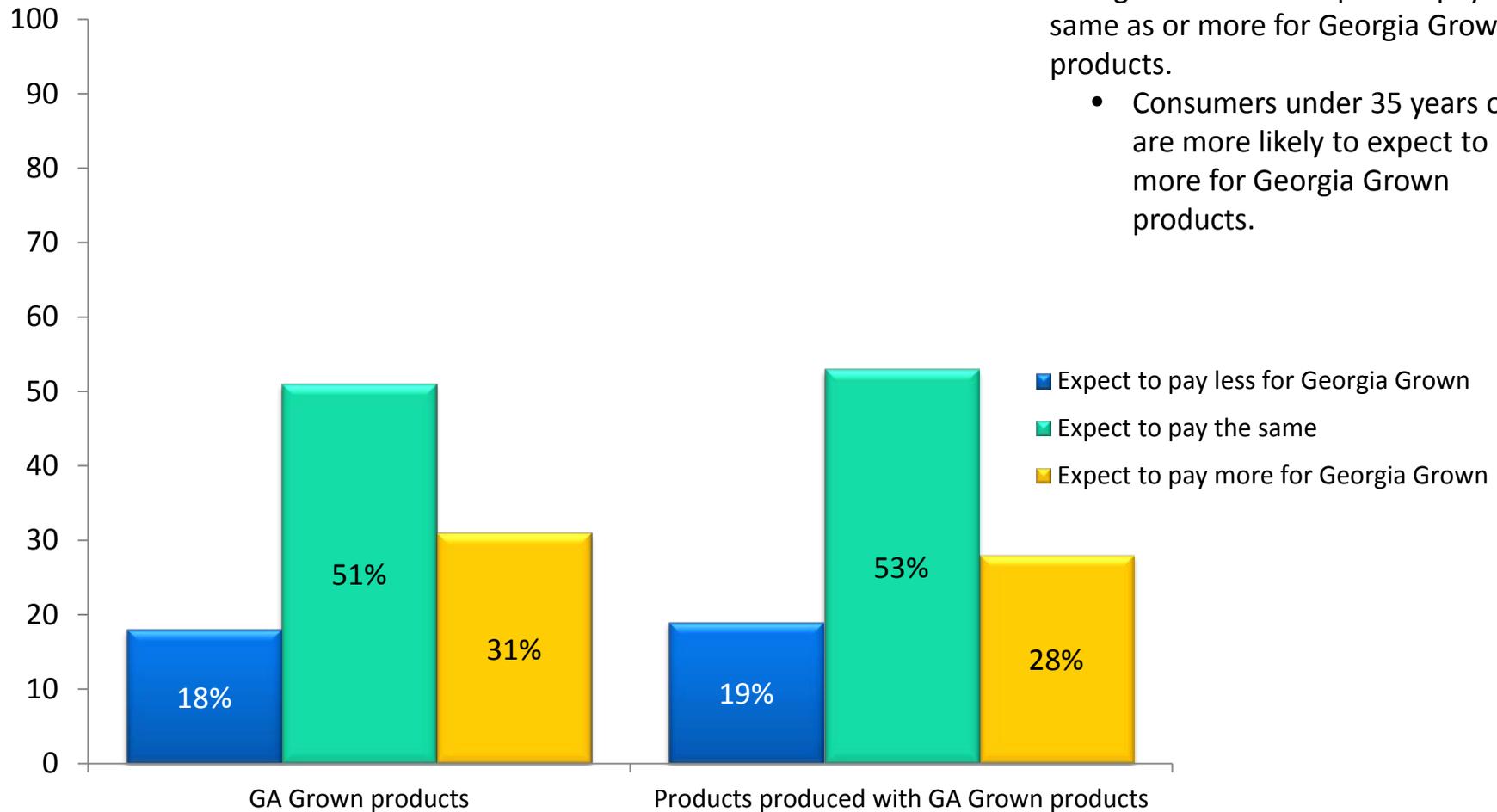
# Purchase Impact of Georgia Grown Labeling



- Almost three quarters of Georgia consumers indicate they are more likely to purchase a product if it is Georgia Grown or made with Georgia Grown products.
  - Those ages 35+ are more likely to say knowledge that a product is Georgia Grown would make them more likely to purchase it.
  - Younger consumers (under 35) say it would not have any impact on their purchase decision.



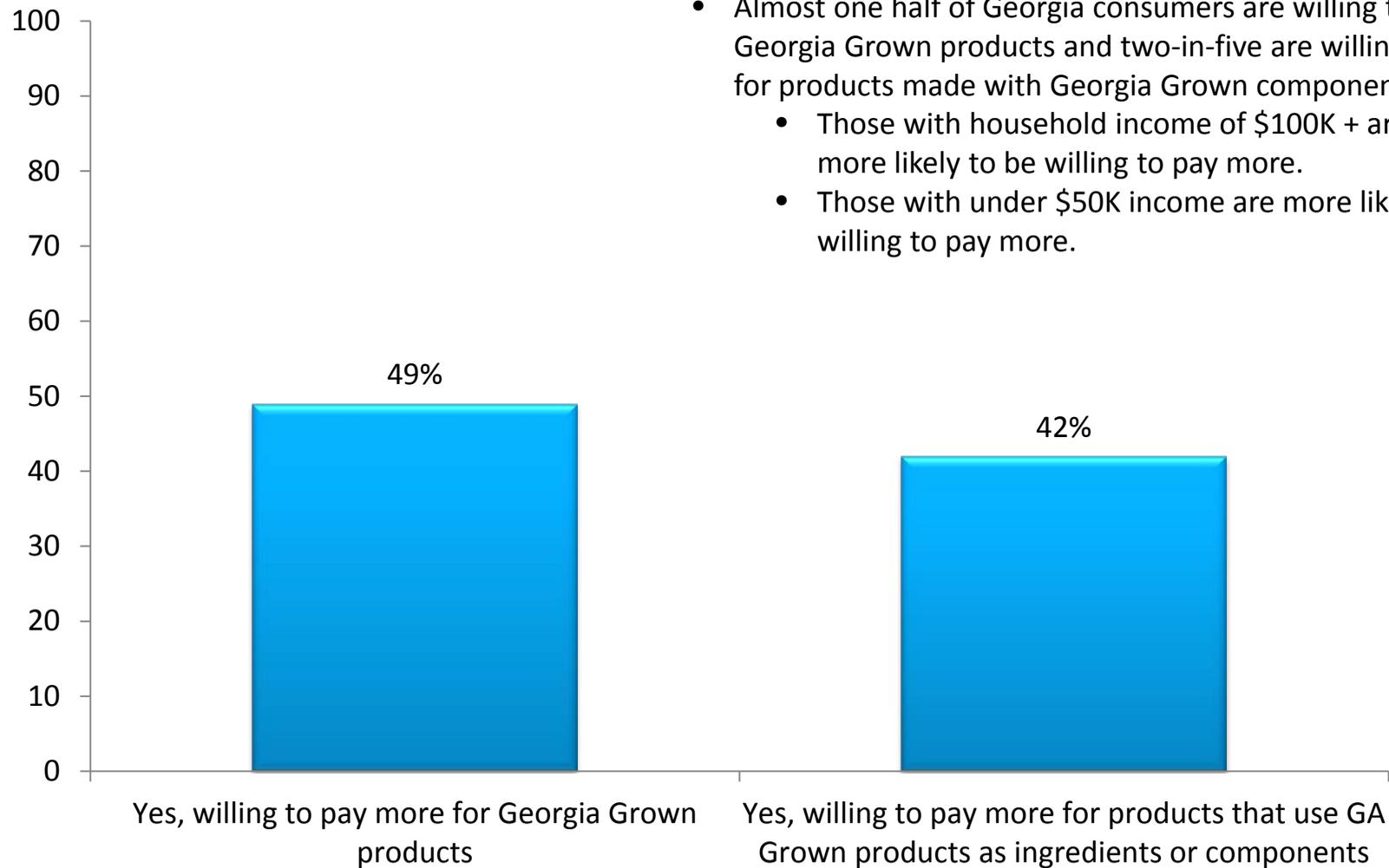
# Cost Expectations for Georgia Grown Products



- Georgia consumers expect to pay the same as or more for Georgia Grown products.
  - Consumers under 35 years of age are more likely to expect to pay more for Georgia Grown products.



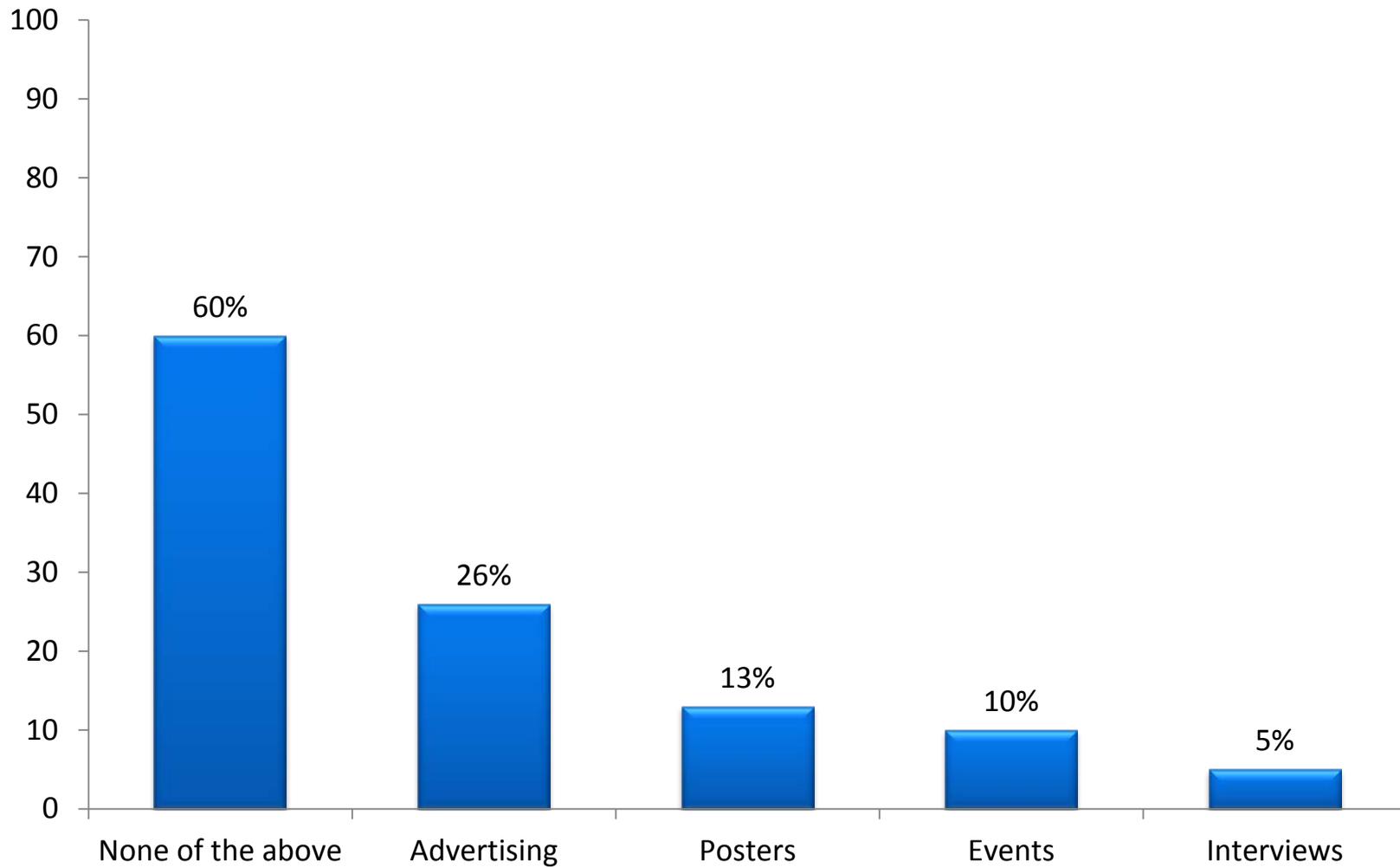
# Willingness to Pay More for...



- Almost one half of Georgia consumers are willing to pay more for Georgia Grown products and two-in-five are willing to pay more for products made with Georgia Grown components.
  - Those with household income of \$100K + are significantly more likely to be willing to pay more.
  - Those with under \$50K income are more likely to **not** be willing to pay more.



# Awareness of Promotions for Georgia Grown



In the last 6 months, or so, have you seen or heard any of the following for Georgia Grown?



# Appendix

# Demographics

	Total (n=402) %
<b>Gender</b>	
Female	76
Male	24
<b>Age</b>	
18 - 24	11
25 - 34	24
35 - 44	18
45 - 54	26
55 - 64	16
65+	5
<b>Ethnicity</b>	
Caucasian	66
African-American/Black	24
Asian	2
Hispanic	2
Other	1
Decline to answer	3

	Total (n=402) %
<b>Shopping responsibility</b>	
Are the person primarily responsible	75
Share the responsibility equally with another	25
<b>Stores shop (primary and secondary)</b>	
Grocery stores (Kroger, Publix, Aldi's, etc.)	89
Mass Merchandisers (Target, Walmart, etc.)	72
Farmers Markets (HMart, DeKalb Farmers Market, etc.)	38
Local outdoor markets	25
Private produce stands	21
Online	6
Other	5



# Demographics

	Total (n=402) %
<b>Marital Status</b>	
Married	60
Single	24
Divorced	12
Widowed	2
Decline to answer	1
<b>Household Size</b>	
1	13
2	30
3	23
4	21
5+	12
<b>Presence of children</b>	
None	51
Under 6	22
6 to 12	24
13 to 17	19
Decline to answer	2

	Total (n=402) %
<b>Education</b>	
Not high school graduate	2
High school graduate	26
Attended college or technical school	36
College graduate	27
Advanced college degree	7
Decline to answer	2
<b>Employment</b>	
Employed full time	41
Employed part-time	13
Not employed/Student/Retired	42
Decline to answer	3
<b>Income</b>	
Under \$30,000	29
\$31-\$49,999	26
\$50,000-\$74,999	21
\$75,000-\$100,000	9
Over \$100,000	7
Decline to answer	8



# Certification Statement

**Job Number: 12-10813**

**Job Name: Georgia Grown Brand Awareness Baseline**

## **Standards**

We hereby certify that the research reported herein was designed, conducted, analyzed, and reported following *generally accepted research procedures* as defined by The CASRO (Council of American Survey Research Organizations) Code of Standards and Code of Business Practices with regard to confidentiality, privacy, disclosure, data collection, data processing, reporting, data ownership, and storage.

CASRO's Data Collection Guidelines and Data Processing Guidelines are an integral part of our quality control process. We follow these guidelines on all MWI projects.

## **Objectivity**

This report fairly, accurately, and objectively reflects the complete results of our research. Nothing has been omitted from the methodology, tabulations, or analytical report which would change the analysis or interpretation of the reported findings.

## **Use of This Research**

MWI offers this research, including its Conclusions and Recommendations, as our professional judgment in understanding the marketing environment facing the client, and what we conclude and recommend based on our knowledge of the situation at hand in relation to our experience and judgment. Acceptance of this research, and action or results of actions based thereon, are the sole responsibility of the client.

This research is for the sole and exclusive proprietary use of our clients and its agents. Any use of this research in advertising, promotion, or publicity should be reviewed by The Marketing Workshop, Inc. prior to such use.

## **Additional Information**

Additional information on any aspect of this research, in accordance with CASRO guidelines, will be provided upon request.

## **Submitted by:**



George Murphy, CMO

The Marketing Workshop, Inc.

October 2012



# 2011 SE Regional Fruit & Vegetable Conference

*Savannah, Georgia*



**SE REGIONAL**  
Fruit & Vegetable Conference



**January 6-9, 2011**

## North American Raspberry & Blackberry Conference

### Wednesday, January 5, 2011

- 11:00-12:30 p.m. **TOUR REGISTRATION**  
Doubletree Hotel  
411 West Bay Street  
Tour loads in front of the Doubletree  
12:15-12:30
- 12:30 - 5:30 p.m. **TOUR**  
**Ottawa Farm**  
Bamboo Farm & Coastal Garden

### Thursday, January 6, 2011

- 7:30 a.m. **Registration Opens**
- 9:00 a.m. - 12:00 **NARBA GENERAL SESSION ROOMS 200/201/202**  
Moderator: Nathan Milburn, Milburn Orchards, Elkton, MD
- 9:00 a.m. **Welcome and Introduction Grower Spotlight**  
Robert Black, Catocin Mountain Orchard, Thurmont, MD
- 10:00 a.m. **Pest Management: Tough Problems and Emerging Issues**  
Dr. Tracy Leskey, USDA Appalachian Fruit Research Station, Kearneysville, WV and Dr. Hannah Burrack, North Carolina State University, Raleigh, NC
- 11:00 a.m. **Harvesting and Packing: Techniques and Systems that Work**  
Grower Panel
- 12:00 p.m. **Lunch and Annual Meeting**  
at The Westin Harbor Ballroom  
"Stressed for Success: Berry Crops, Environmental Stressors, and Human Health Benefits"  
Dr. Mary Ann Lila, Plants for Human Health Institute, North Carolina State University, Kannapolis, NC
- 2:00 - 5:00 p.m. **NARBA CONCURRENT SESSIONS**  
**NARBA EDUCATIONAL SESSION I - ROOM 203**  
**TRELLISING/DISEASE/UPDATES**  
Moderator: Jeff Chandler, Sandhills Research Station, Jackson Springs, NC

- 2:00 p.m. **Trellising Options and Economics**  
Dr. Charles Safley, North Carolina State University, Raleigh, NC and Dr. Gina Fernandez, North Carolina State University, Raleigh, NC
- 3:00 p.m. **Disease Challenges for the Raspberry & Blackberry Industries**  
Dr. Phil Brannen, University of Georgia, Athens, GA
- 4:00 p.m. **Updates on Caneberry Breeding and Research**  
Dr. Gina Fernandez, North Carolina State University, Raleigh, NC; Dr. Robert Martin, USDA-ARS, Corvallis, OR; Dr. Eric Hanson, Michigan State University, East Lansing, MI; Dr. Ioannis Tzanetakos, University of Arkansas, Fayetteville, AR; Dr. Penelope Perkins-Veazy, NC State University, Kannapolis, NC
- NARBA EDUCATIONAL SESSION II ROOM 204**  
**HIGH TUNNELS/MARKETING**
- 2:00 p.m. **Current Status and Information Needs in High Tunnel Berry Culture**  
Dr. Eric Hanson, Michigan State University, East Lansing, MI; Dr. Marvin Pritts, Cornell University, Ithaca, NY; Jason Cox, Lewis Nursery & Farms, Rocky Point, NC; Fred Koenigshof, K&K Farms, Coloma, MI
- 4:00 p.m. **How to Protect Yourself in the Wholesale Market**  
Gary Nefferdorf, USDA Agricultural Marketing Service, Fruit & Vegetables Program, PACA Branch and Patrick Hanemann, Fruit & Vegetable Dispute Resolution Corporation
- NARBA EDUCATIONAL SESSION III ROOM 205**  
**THE BERRY FUNDAMENTALS**
- 2:00 p.m. **Workshop: Fundamentals of Blackberry & Raspberry Production for Small-scale Growers with Local and Direct Markets**  
Dr. Gina Fernandez, North Carolina State University, Raleigh, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY; Fritz Aichele, Maple Ridge Farm, Walterboro, SC
- NARBA EDUCATIONAL SESSION IV ROOMS 103/104**  
**BUSINESS OPERATIONS**  
Please see page 27

## North American Raspberry & Blackberry Conference

- 2:00 p.m. **Website Design and Optimization**  
Mrs. Celena Williams, C7 Marketing, Cornelia, GA
- 2:45 p.m. **Using Social Media for Direct Marketing**  
Mrs. Celena Williams, C7 Marketing, Cornelia, GA
- 3:15 p.m. **Crisis Communication & Media Training**  
Mr. Brad Haire, University of Georgia, Tifton, GA; Ms. Faith Peppers, University of Georgia, Atlanta, GA
- 6:30 p.m. **DUTCH TREAT BRAMBLE GROWERS DINNER** at The Boar's Head Grill & Tavern (Lincoln and East River Street)

### Friday, January 7, 2011

- 7:00 a.m. **Registration Opens**
- 9:00 a.m. SE Regional Fruit and Vegetable Conference Trade Show Opens
- 9:00-11:00 a.m. **NARBA EDUCATIONAL SESSION V ROOMS 200/201/202 GROWER INFORMATION**  
Moderator: Lee Matteson, The Berry Patch Farm, Nevada, IA
- 9:00 a.m. **Grower Spotlight:** Eric Pond, Riverbend Organic Farms, Jefferson, OR
- 9:45 a.m. **Improving Flavor of Blackberries through Breeding and Planting Management: The Key to Industry Growth?**  
Dr. John R. Clark, University of Arkansas, Fayetteville, AR (presented by Dr. Penelope Perkins-Weazy, North Carolina State University, Kannapolis, NC)
- 10:30 a.m. **Update on Policy and Issues: Food Safety and Labor**
- 10:50 a.m. **Diversifying Your Market**  
Grower Panel: Nate Nourse, Nourse Farms, E. Deerfield, MA; Anne Geyer, Agriberry Farm, Studley, VA; Eric Pond, Riverbend Organic Farms, Jefferson, OR; Brent Brown, Double B Farms, Fallston, NC
- 12:00-1:30 p.m. Lunch and Visit Trade Show

- 1:30-4:30 p.m. **NARBA CONCURRENT SESSIONS NARBA EDUCATIONAL SESSION VI ROOMS 200/201 COMMERCIAL BLACKBERRY TRACK**  
Moderator: Ervin Lineberger, Kildeer Farm, Kings Mountain, NC

- 1:30 p.m. **Creating a Sustainable Blackberry Industry**  
*What's Happening in the Blackberry Industry - Review and Outlook; Crop and Market Forecasting*  
John Shelford, Shelford Associates/FreshXperts, Naples, FL; Brenda Likes, USDA-Agricultural Marketing Service, North Highlands, CA

*The Mexican Perspective: How We Grow, Harvest, and Market Blackberries*  
Jose' Luis Bustamante, Hortifruit-Mexico

*Proposal for a Blackberry Research & Promotion Program: Working together for a vibrant and profitable industry*  
Members of the Blackberry R&P Working Group

- NARBA EDUCATIONAL SESSION VII ROOM 202 THE "DIRT TRACK"**
- 1:30 p.m. **Soils, Soil Issues, & Bramble Nutrition**  
Dr. John Havlin, North Carolina State University, Raleigh, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY; Dr. Eric Hanson, Michigan State University, East Lansing, MI

- 3:30 p.m. **Weed Control, Barrier Materials, Mulches & Ground Covers**  
Wayne Mitchem, North Carolina State University, MHCRC, Mills River, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY

- 4:45 p.m. **SE Regional Fruit and Vegetable Conference Welcome Reception** in Trade Show Area  
(Open to all registered attendees)

- 5:45 p.m. **SE Regional Fruit and Vegetable Conference Live Auction** in Exhibit Hall

Registered attendees of the North American Raspberry and Blackberry Conference will have access to all SE Regional educational programs on Friday and Saturday plus admission to the SE Regional Trade show.



## Schedule of Events At-A-Glance

### Wednesday, January 5, 2011

- 12:30 p.m. **2011 North American Raspberry & Blackberry Conference**  
Tour of local farms and other agricultural locations

### Thursday, January 6, 2011

- 7:30 a.m. **Registration Open**  
Convention Center Concourse
- 8:00 a.m. - 5:00 p.m. **2011 North American Raspberry & Blackberry Conference**  
Educational Sessions (a.m.) - Rooms 200/201/202  
Lunch and Annual Meeting  
Educational Sessions (p.m.) - Rooms 203/204  
Workshop - Room 205
- 12:00 p.m. **GFVGA Board of Director's Meeting**  
Westin Savannah Harbor
- 1:30 p.m. - 5:00 p.m. **SE Regional Educational Session**  
Business Operations Track I - Rooms 103/104  
(workshops to increase profitability and marketability)
- 5:00 p.m. **GFVGA Annual Meeting** - Room 102
- 5:00 p.m. **Registration Closes**

### Friday, January 7, 2011

- 7:00 a.m. **Registration Opens**
- 8:00 a.m. - 11:00 a.m. **2011 North American Raspberry & Blackberry Conference**  
Educational Sessions - Rooms 200/201/202  
Lunch
- 8:00 a.m. - 11:00 a.m. **SE Regional Educational Sessions**  
Blackberry & Raspberry - Rooms 200/201/202  
Blueberry - 100/101  
Food Safety - Rooms 204/205  
Organic Production - 100/101  
Peach - Rooms 105/106  
Pecan - Room 203  
Sweet Corn - Rooms 103/104  
Vegetable - Rooms 103/104
- 9:00 a.m. **Trade Show Opens**
- 12:00 p.m. **Lunch with Exhibitors in the Trade Show**  
Lunch included in Four Day and Friday registration, you should receive a lunch ticket when you register.
- 1:30 p.m. - 4:00 p.m. **2011 North American Raspberry & Blackberry Conference**  
Educational Sessions - Rooms 200/201/202

# Schedule of Events

## At-A-Glance

- 1:30 p.m. - 4:30 p.m.** **SE Regional Educational Sessions**  
 Blackberry and Raspberry - 200/201/202  
 Blueberry - Auditorium  
 Food Safety - Rooms 204/205  
 Organic Production - Rooms 100/101  
 Peach - Rooms 105/106  
 Pecan - Room 203  
 Roadside Markets - Room 102  
 Vegetable - Rooms 103/104
- 4:45 p.m.** **Welcome Reception**  
 Trade Show Floor
- 5:45 p.m.** **Live Auction**  
 Trade Show Floor
- 6:15 p.m.** **Trade Show Closes**
- Saturday, January 8, 2011**
- 8:00 a.m.** **Awards Breakfast** - Ticketed Event  
 Westin Savannah Harbor - Harbor Ballroom
- 8:00 a.m.** **Registration Opens**  
 Convention Center Concourse
- 9:00 a.m.** **Trade Show Opens**
- 12:00 p.m.** **Lunch with Exhibitors in the Trade Show**  
 Lunch included in Four Day and Saturday registration, you should receive a lunch ticket when you register.
- 2:00 p.m.** **Silent Auction Closes**
- 2:00 p.m. - 5:00 p.m.** **SE Regional Educational Sessions**  
 Business Operations Track II - Pulaski Board Room  
 Food Safety - Room 204  
 Muscadine - Room 205  
 Peach - Rooms 105/106  
 Strawberry - Room 203  
 Vegetable - Rooms 102/103/104  
 Vidalia Onion - Rooms 103/104  
 Watermelon - Rooms 103/104
- 2:30 p.m.** **Trade Show Closes**
- 6:00 p.m.** **Reception at Westin sponsored by **
- Sunday, January 9, 2011**
- 8:00 a.m.** **Worship Service**  
 Westin Savannah Harbor
- 8:30 a.m.** **Industry Roundtable Discussion**  
 Westin Savannah Harbor
- 10:30 a.m.** **Convention Adjourns**



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# Peach Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

## THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m.** **REGISTRATION OPEN**  
 Riverview Concourse  
 Exhibitor and Poster Set-Up
- 12:00 p.m.** **GFVGA BOARD OF DIRECTORS MEETING**  
 Westin Savannah Harbor
- 1:30 - 5:00 p.m.** **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS** - Rooms 103/104
- 5:00 p.m.** **GFVGA ANNUAL MEETING** - Room 102  
 SITCC

## FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m.** **REGISTRATION OPEN**  
 Riverview Concourse
- 8:00-11:30 a.m.** **PEACH EDUCATIONAL SESSION I**  
 Rooms 105/106  
**RECOGNIZING STRESS FACTORS**  
 Moderator: Mr. Andy Rollins, Clemson University, Spartanburg, SC
- 8:00 a.m.** **Recognizing Stress Factors in Orchards**  
 Dr. Desmond Layne, Clemson University, Clemson, SC
- 8:30 a.m.** **Virus Induced Stress**  
 Dr. Simon Scott, Clemson University, Clemson, SC
- 9:00 a.m.** **Insect Incidence Relative to Tree Stress**  
 Dr. Dan Horton, University of Georgia, Athens, GA
- 9:30 a.m.** **Factors to Consider in an Efficient Fertility Program**  
 Dr. David Lockwood, University of Tennessee, Knoxville, TN
- 10:00 a.m.** **BREAK**
- 10:15 a.m.** **Field Mapping and Sensor Technology**  
 Mr. Will Henderson, Clemson University, Blackville, SC
- 10:45 a.m.** **Improving Spray Deposition I**  
**The Role of Droplets and Air**  
 Dr. Andrew Landers, Cornell University, Geneva, NY

- 9:00-6:15 p.m.** **TRADE SHOW OPEN**
- 12:00-1:30 p.m.** **LUNCH** in the Trade Show  
 (Lunch provided for Four Day and Friday Only Registrants)
- 2:00 - 4:00 p.m.** **PEACH EDUCATIONAL SESSION II**  
 Rooms 105/106  
**Orchard Stress Management**  
 Moderator: Mr. Danny Howard, Clemson University, Greenville, SC
- 2:00 p.m.** **Improving Spray Deposition II**  
**Getting Sprays on Target**  
 Dr. Andrew Landers, Cornell University, Geneva, NY
- 2:30 p.m.** **Herbicide Stewardship**  
**Good for the Trees, Bad for the Weeds**  
 Mr. Wayne Mitchem, North Carolina State University, Mills River, NC
- 3:00 p.m.** **Stress Factors Relative to Bacterial Disease Complexes**  
 Dr. Dave Ritchie, North Carolina State University, Raleigh, NC
- 3:30 p.m.** **Addressing Oak Root Rot in Replant Sites**  
 Dr. Guido Schnabel, Clemson University, Clemson, SC
- 4:00 p.m.** **Managing Nematode Pests: A Case for Cover Crops in Establishing Peach Orchards**  
 Dr. Andy Nyczepir, USDA-Byron, Byron, GA
- 4:30 p.m.** **Do Spring Temperatures Affect Fruit Sizing?**  
 Dr. Greg Reighard, Clemson University, Clemson, SC
- 4:45 - 6:00 p.m.** **WELCOME RECEPTION** in Trade Show Area  
 (Open to all registered attendees)
- 5:45 p.m.** **LIVE AUCTION** in Exhibit Hall
- Evening** **DINNER ON YOUR OWN**

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## Peach Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted. Pesticide information on pages 38-39.

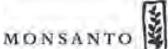
### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:00-4:45 p.m. **PEACH EDUCATIONAL SESSION III**  
Rooms 105/106  
**General Issues in Fruit Production**  
Moderator: Mr. Jeff Cook, University of Georgia, Butler, GA
- 2:00 p.m. **Improved Post Harvest Fungicide Application Technology**  
Mr. Alex Cochran, Syngenta Crop Protection, Granite Bay, CA
- 2:30 p.m. **Extending Fruit Quality Beyond the Packing Line**  
Dr. George Pierce, Georgia State University, Atlanta, GA
- 3:00 p.m. **National Peach Council Update**  
Ms. Kay Rentzel, Dillsburg, PA
- 3:30 p.m. **Risk Management Agency Update**  
Mr. Bill Murphy, USDA-RMA; Washington, DC
- 4:00 p.m. **Questions/Panel Discussion**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by
- Evening **DINNER ON YOUR OWN** 

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**

## Vegetable Conference

Sponsored by  **MONSANTO**  
Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION**  
**BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102**  
SITCC

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 8:00-9:00 a.m. **VEGETABLE EDUCATIONAL SESSION I**  
Rooms 103/104  
**PESTICIDE UPDATE AND COMMODITY COMMISSION RESEARCH**  
Moderator: Brian Tankersley, Georgia Cooperative Extension - Tift County, Tifton, GA
- 8:00 a.m. **New Insecticides for Management of Insects in Vegetables**  
Stormy Sparks, The University of Georgia, Tifton, GA
- 8:20 a.m. **New Fungicides for Management of Diseases in Vegetables**  
David Langston, The University of Georgia, Tifton, GA
- 8:40 a.m. **New Herbicide Tools for Vegetable Weed Control**  
Stanley Culppepper, The University of Georgia, Tifton, GA
- 9:00 a.m. **BREAK**
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 9:30-11:00 a.m. **VEGETABLE EDUCATIONAL SESSION II**  
Rooms 103/104  
**SWEET CORN AND GMO CROPS**  
Moderator: Justin Shealey, Georgia Cooperative Extension - Echols County, Statenville, GA
- 9:30 a.m. **Biotech Acceptance and Vegetables**  
Paulette Pierson, Industry Affairs Lead for Vegetables, Monsanto, St. Louis, MO

- 10:00 a.m. **B.t. Sweet Corn and New Insecticides for Management of Caterpillar Pests of Sweet Corn**  
Stormy Sparks, The University of Georgia, Tifton, GA
- 10:30 a.m. **Management Programs for Foliar Diseases of Sweet Corn**  
Richard Raid, University of Florida, Belle Glade, FL
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 2:40 p.m. **VEGETABLE EDUCATIONAL SESSION III**  
Rooms 103/104  
**METHYL BROMIDE ALTERNATIVES AND FUMIGATION REGULATIONS**  
Moderator: Glenn Beard, Georgia Cooperative Extension - Colquitt County, Moultrie, GA
- 1:30 p.m. **Disease and Nematode Management with Methyl Bromide Alternatives**  
David Langston, The University of Georgia, Tifton, GA
- 1:50 p.m. **The Most Effective Fumigant/Herbicide Systems for 2011**  
Stanley Culppepper, The University of Georgia, Tifton, GA
- 2:10 p.m. **Fumigant Regulatory Update and Implementation**  
Richard Keigwin, Director of Pesticide Re-evaluation Division of US EPA, Washington, DC
- 2:40 p.m. **BREAK**
- 3:00 - 4:30 p.m. **VEGETABLE EDUCATIONAL SESSION IV**  
Rooms 103/104  
**FUMIGATION TRAINING**
- 3:00 p.m. **EPA's New Fumigant Regulations: What You Need to Know Prior to Using Soil Fumigants in 2011**  
Andrew MacRae, Joseph Noling, and Crystal Snodgrass, University of Florida/IFAS
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

Sponsored by **MONSANTO**  
Pesticide information on pages 38-39.

## Vegetable Conference

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:00 -3:00 p.m. **CONCURRENT SESSIONS**
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION V**  
Room 102  
**BIO-ENERGY**  
Moderator: Tucker Price, Georgia Cooperative Extension - Crisp County, Cordele, GA
- 2:00 p.m. **Seven Ways to Manage Fruit and Vegetable Waste**  
Gary Hawkins, The University of Georgia, Tifton, GA
- 2:20 p.m. **Current Research Results from Co-Digestion of Culled Fruits and Animal Waste**  
Gary Hawkins, The University of Georgia, Tifton, GA
- 2:40 p.m. **Why Would a Company Be Interested in Using Culled Fruits and Vegetables for Producing Renewable Energy?**  
Omar Cruz, Bland Onion, Reidsville, GA; Peter Germishuizen, Lewis Taylor Farms, Tifton, GA
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION VI**  
Rooms 103/104  
**ONION PRODUCTION**  
Moderator: Cliff Riner, Georgia Cooperative Extension Service - Tattnall County, Reidsville, GA
- 2:00 p.m. **Advance Onion Postharvest Handling Efficiency and Sustainability with an Interdisciplinary Approach**  
Changying "Charlie" Li, The University of Georgia, Tifton, GA
- 2:20 p.m. **Update on Yellow bud and Sour Skin in Onions**  
Ron Gitaitis, The University of Georgia, Tifton, GA
- 2:40 p.m. **Converting the Sweet Onion into an Odorless Gas**  
Gary Hawkins, The University of Georgia, Tifton, GA

- 2:30 p.m. **TRADE SHOW CLOSES**
- 3:00 p.m. **BREAK**
- 3:20 -4:20 p.m. **CONCURRENT SESSIONS**
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VII**  
Room 102  
**INSECT RELATED ISSUES IN VEGETABLES**  
Moderator: Stormy Sparks, The University of Georgia, Tifton, GA
- 3:20 p.m. **IPM Practices for Management of Pests of Leafy Brassica Greens**  
Powell Smith, Extension Associate, CUCES-Lexington County, Clemson University, Lexington, SC
- 3:40 p.m. **Updates on Whiteflies and Tomato Yellow Leafcurl Virus Research in Georgia**  
R. Srinivasan, D. Riley, and A. Sparks, The University of Georgia, Tifton, GA
- 4:00 p.m. **The Bean Plataspid - A New Pest of Beans in Georgia**  
Phillip Roberts and Stormy Sparks, The University of Georgia, Tifton, GA
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VIII**  
Rooms 103/104  
**DISEASE ISSUES IN VEGETABLES**  
Moderator: Phillip Edwards, Georgia Cooperative Extension - Irwin County, Ocilla, GA
- 3:20 p.m. **Differentiation and Integrated Management of Tomato Bacterial Speck and Spot**  
Gary Vallad, University of Florida, Wimauma, FL
- 3:40 p.m. **Research Update on Managing Phytophthora Blight on Vegetables**  
Pingsheng Ji, The University of Georgia, Tifton, GA
- 4:00 p.m. **Watermelon Diseases and Their Management**  
David Langston, The University of Georgia, Tifton, GA
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by **syngenta**.
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE** - Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor
- 10:30 a.m. **CONVENTION ADJOURNS**

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## Vidalia Onion Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION**  
**BUSINESS OPERATIONS** - Rooms 103/104
- 5:00 p.m. **GFVGA ANNUAL MEETING** - Room 102

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN** - Riverview Concourse
- 8:00-9:00 a.m. **VEGETABLE EDUCATIONAL SESSION I**  
Rooms 103/104  
**PESTICIDE UPDATE AND COMMODITY COMMISSION RESEARCH**  
Please see page 22
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 9:30-11:00 a.m. **VEGETABLE EDUCATIONAL SESSION II**  
Rooms 103/104  
**SWEET CORN AND GMO CROPS**  
Please see page 22
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 2:40 p.m. **VEGETABLE EDUCATIONAL SESSION III**  
Rooms 103/104  
**METHYL BROMIDE ALTERNATIVES AND FUMIGATION REGULATIONS**  
Please see page 22
- 3:00 - 4:30 p.m. **VEGETABLE EDUCATIONAL SESSION IV**  
Rooms 103/104  
**FUMIGATION TRAINING**  
Please see page 22
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**
- 9:00-2:30 p.m. **TRADE SHOW OPEN**

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- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 -3:00 p.m. **CONCURRENT SESSIONS**
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION V**  
Room 102  
**BIO-ENERGY** - Please see page 23
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION VI**  
Rooms 103/104  
**ONION PRODUCTION**  
Moderator: Cliff Riner, Georgia Cooperative Extension Service - Tattnall County, Reidsville, GA
- 2:00 p.m. **Advance Onion Postharvest Handling Efficiency and Sustainability with an Interdisciplinary Approach**  
Changying "Charlie" Li, The University of Georgia, Tifton, GA
- 2:20 p.m. **Update on Yellow bud and Sour Skin in Onions**  
Ron Gitaitis, The University of Georgia, Tifton, GA
- 2:40 p.m. **Converting the Sweet Onion into an Odorless Gas**  
Gary Hawkins, The University of Georgia, Tifton, GA
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 3:00 p.m. **BREAK**
- 3:20 -4:20 p.m. **CONCURRENT SESSIONS**
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VII**  
Room 102  
**INSECT RELATED ISSUES IN VEGETABLES** - Please see page 23
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VIII**  
Rooms 103/104  
**DISEASE ISSUES IN VEGETABLES**  
Please see page 23
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by **syngenta**.
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor
- 10:30 a.m. **CONVENTION ADJOURNS**

GFVGA Grower News/2011 SE REGIONAL FRUIT & VEGETABLE CONFERENCE EDITION

GFVGA Grower News/2011 SE REGIONAL FRUIT & VEGETABLE CONFERENCE EDITION

Pesticide information on pages 38-39.

## Organic Conference

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102 SITCC**

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 8:30 - 10:15 a.m. **ORGANIC EDUCATIONAL SESSION I Rooms 100/101 ORGANIC PRODUCTION**  
Moderator: James Brown, Fort Valley State University, Fort Valley, GA
- 8:30 a.m. **Management of Diseases in Organic Blueberries**  
Dr. Annemiek Schilder, Michigan State University, East Lansing, MI
- 9:15 a.m. **Fertility Management in Organic Production**  
Julia Gaskin, University of Georgia, Athens, GA
- 9:45 a.m. **Opportunities and Challenges in Heirloom Tomato Production**  
Dr. Jeanine Davis, North Carolina State University, Fletcher, NC
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 10:45-12:00 p.m. **ORGANIC EDUCATIONAL SESSION II Rooms 100/101 EFFICIENT PRACTICES TO INCREASE PROFITABILITY**  
Moderator: Ray Hicks, Screven County Extension, Sylvania, GA
- 10:45 a.m. **Simple Solutions and Other Tips for Improved Labor Efficiency**  
Dr. Glen Rains, Biological and Agricultural Engineering, University of Georgia, Tifton, GA
- 11:15 a.m. **Farmer Tips on Improving Machinery and Efficiency**  
Dave Bentowski, D&A Farms, Zebulon, GA
- 11:45 a.m. **Discussion**

- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 3:00 p.m. **ORGANIC EDUCATIONAL SESSION III Rooms 100/101 INSECT PEST MANAGEMENT**  
Moderator: Relinda Walker, Walker Farms, Sylvania, GA
- 1:30 p.m. **Organic Insect Pest Management**  
Powell Smith, Clemson University, Lexington, SC
- 2:00 p.m. **Effective Organic Pest Management Strategies - The Farmers' Perspective**  
Daniel Parson, Parson Produce, Clinton, SC
- 2:30 p.m. **Discussion**
- 3:15 - 4:45 p.m. **ORGANIC EDUCATIONAL SESSION IV Rooms 100/101 MARKETING**  
Moderator: Raymond Joyce, Laurens Co Extension, Dublin, GA
- 3:15 p.m. **Trends and Opportunities in the Organic Market**  
Jonathan Tescher, Georgia Organics, Atlanta, GA
- 3:45 p.m. **Market Opportunities in the Wholesale and Institutional Markets**  
Cheryl Wilson, Fresh Point, Atlanta, GA
- 4:00 p.m. **Farm Box Delivery Programs**  
Matt Roher, Cha-Bella, Savannah, GA
- 4:15 p.m. **Panel Discussion**
- 4:45 - 6:00 p.m. **WELCOME RECEPTION**  
in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

Please review other Conference Agenda for additional educational sessions, trade show events, and entertainment opportunities during the Saturday and Sunday Program that you don't want to miss.

## Blackberry & Raspberry Conference

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS - Rooms 103/104**
- 2:00 - 5:00 p.m. **Workshop: Fundamentals of Blackberry & Raspberry Production for Small-scale Growers with Local and Direct Markets Room 205**  
Dr. Gina Fernandez, North Carolina State University, Raleigh, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY; Fritz Aichele, Maple Ridge Farm, Walterboro, SC  
(limited space - additional fee for this workshop for SE Regional attendees)

The Blackberry/Raspberry sessions on Thursday morning and afternoon (excluding the Fundamentals Workshop) are only available to North American Raspberry & Blackberry Conference attendees. Blackberry/Raspberry sessions on FRIDAY are open to all SE Regional Fruit and Vegetable Conference attendees.

- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102**
- 6:30 p.m. **DUTCH TREAT BRAMBLE GROWERS DINNER** at The Boar's Head Grill & Tavern (Lincoln and East River Street)

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-11:00 a.m. **NARBA EDUCATIONAL SESSION V GROWER INFORMATION ROOMS 200/201/202**  
Moderator: Lee Matteson, The Berry Patch Farm, Nevada, IA
- 9:00 a.m. **Grower Spotlight**  
Eric Pond, Riverbend Organic Farms, Jefferson, OR
- 9:45 a.m. **Improving Flavor of Blackberries through Breeding and Planting Management: The Key to Industry Growth?**  
Dr. John R. Clark, University of Arkansas, Fayetteville, AR (presented by Dr. Penelope Perkins-Veazy, North Carolina State University, Kannapolis, NC)

- 10:30 a.m. **Update on Policy and Issues: Food Safety and Labor**
- 10:50 a.m. **Diversifying Your Market**  
Grower Panel: Nate Nourse, Nourse Farms, E. Deerfield, MA; Anne Geyer, Agriberry Farm, Studley, VA; Eric Pond, Riverbend Organic Farms, Jefferson, OR; Brent Brown, Double B Farms, Fallston, NC
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 4:30 p.m. **NARBA CONCURRENT SESSIONS NARBA EDUCATIONAL SESSION VI COMMERCIAL BLACKBERRY TRACK ROOMS 200/201**  
Moderator: Ervin Lineberger, Kildeer Farm, Kings Mountain, NC
- 1:30 p.m. **Creating a Sustainable Blackberry Industry**  
*What's Happening in the Blackberry Industry - Review and Outlook; Crop and Market Forecasting*  
John Shelford, Shelford Associates/FreshXperts, Naples, FL; Brenda Likes, USDA-Agricultural Marketing Service, North Highlands, CA  
*The Mexican Perspective: How We Grow, Harvest, and Market Blackberries*  
Jose' Luis Bustamante, Hortifruit-Mexico  
*Proposal for a Blackberry Research & Promotion Program: Working together for a vibrant and profitable industry*  
Members of the Blackberry R&P Working Group
- 1:30 p.m. **NARBA EDUCATIONAL SESSION VII THE "DIRT TRACK" ROOM 202**  
**Soils, Soil Issues, & Bramble Nutrition**  
Dr. John Havlin, North Carolina State University, Raleigh, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY; Dr. Eric Hanson, Michigan State University, East Lansing, MI

Pesticide information on pages 38-39.

- 3:30 p.m. **Weed Control, Barrier Materials, Mulches & Ground Covers**  
Wayne Mitchem, North Carolina State University, MHCRC, Mills River, NC; Dr. Marvin Pritts, Cornell University, Ithaca, NY
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area (Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show (Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:00-5:00 p.m. **EDUCATIONAL SESSIONS**  
Review other Conference Agendas for additional education sessions you don't want to miss.
- 2:30 p.m. **TRADE SHOW CLOSES**
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor (Open to All Attendees)  
Reception sponsored by 
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**

## Business Operations

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS I** - Rooms 103/104
- 1:30 p.m. **Business Expense Analysis and Recovery Program**  
Wendell Ebbett, Business Strategist, Ebbett Business Solutions, Sharpsburg, GA
- 2:00 p.m. **Website Design and Optimization**  
Mrs. Celena Williams, C7 Marketing, Cornelia, GA
- 2:30 p.m. **BREAK**
- 2:45 p.m. **Using Social Media for Direct Marketing**  
Mrs. Celena Williams, C7 Marketing, Cornelia, GA
- 3:15 p.m. **Crisis Communication & Media Training**  
Mr. Brad Haire, University of Georgia, Tifton, GA; Ms. Faith Peppers, University of Georgia, Atlanta, GA
- 5:00 p.m. **GFVGA ANNUAL MEETING** - Room 102  
SITCC

### SATURDAY, JANUARY 8, 2011

- 2:00 - 4:00 p.m. **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS II** - Pulaski Board Room
- 2:00 p.m. **CH Robinson Worldwide**  
Shannon Leigh, Sales Manager, CH Robinson Worldwide, Carmel, CA
- 2:30 p.m. **Business Expense Analysis and Recovery Program**  
Wendell Ebbett, Business Strategist, Ebbett Business Solutions, Sharpsburg, GA
- 3:00 p.m. **Getting Paid**  
Gary Nefferdorf, Assistant Regional Director, USDA, AMS, PACA Branch, Manassas, VA and Patrick Hanemann, Consultant, Fruit & Vegetable Dispute Resolution Corporation, McAllen, TX

## Muscadine Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION BUSINESS OPERATIONS** - Rooms 103/104
- 5:00 p.m. **GFVGA ANNUAL MEETING** - Room 102  
SITCC

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show (Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 4:30 p.m. **ROADSIDE MARKET EDUCATIONAL SESSION** - Room 102  
Please see page 33
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area (Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show (Lunch provided for Four Day and Saturday Only Registrants)
- 1:30 p.m. **Business Meeting of the Georgia Muscadine Association** - Room 205

- 2:00-4:30 p.m. **MUSCADINE EDUCATIONAL SESSION Room 205**  
Moderator: Dr. Patrick Conner, University of Georgia, Tifton, GA
- 2:00 p.m. **Current Progress in Genetically Modified Grape Research at the University of Florida**  
Dr. Dennis Gray, University of Florida, Apopka, FL
- 2:20 p.m. **Postharvest Storage of Muscadine Grapes**  
Dr. Penelope Perkins-Veazie, North Carolina State University, Kannapolis, NC
- 2:40 p.m. **Dormant Pruning Innovations in Processing and Fresh Market Muscadine Grapes**  
E. Barclay Poling, Professor Emeritus, North Carolina State University, Raleigh, NC; Stephanie Romelczyk, Extension Agent, North Carolina State University, Sanford, NC
- 3:00 p.m. **BREAK**
- 3:20 p.m. **How to Grow Organic and Beyond - High Brix, Quality and Profitable Grapes**  
Ray Nielson, Green World Path, Brooksville FL
- 3:40 p.m. **Sources of Information on the Internet for Muscadine Culture**  
Dr. Patrick Conner, University of Georgia, Tifton, GA
- 4:00 p.m. **Grow Your Own Organic Muscadines**  
Jerald Larson, Fort Valley State University, Swainsboro, GA
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor (Open to All Attendees)  
Reception sponsored by 
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**

Pesticide information on pages 38-39.

## Pecan Conference

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION  
BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102  
SITCC**

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 10:00 - noon **PECAN EDUCATIONAL SESSION I  
Room 203**  
Moderator: Dr. Lenny Wells,  
University of Georgia, Tifton, GA
- 10:00 a.m. **Precision Fertilizer Management for Pecan**  
Lenny Wells, University of Georgia, Tifton, GA
- 10:20 a.m. **Review of Early Pecan Varieties**  
Bill Goff, Auburn University, Auburn, AL
- 10:40 a.m. **Nitrogen Sources for Pecan**  
Bruce Wood, USDA-ARS, Byron, GA
- 11:00 a.m. **BREAK**
- 11:20 a.m. **Antioxidant Capacities of Pecans**  
Ron Pegg, University of Georgia, Athens, GA
- 11:40a.m. **Managing Black Aphids**  
Will Hudson, University of Georgia, Tifton, GA
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Friday Only Registrants)
- 1:30 - 4:30 p.m. **PECAN EDUCATIONAL SESSION II  
Room 203**  
Moderator: Dr. Lenny Wells,  
University of Georgia, Tifton, GA
- 1:30 p.m. **Pecans and the Georgia Department  
of Agriculture**  
Gary Black, Commissioner, Georgia Department  
of Agriculture, Atlanta, GA
- 2:00 p.m. **Experiences with Solar Irrigation in Pecan**  
Trey Pippin, Pecan Grower, Albany, GA

- 2:20 p.m. **Update on NRCS Programs for Pecans**  
Jimmy Bramblett, USDA-NRCS, Athens, GA
- 3:00 p.m. **Legislative Report**  
Bob Redding, Redding Firm,  
Washington, D.C.
- 3:30 p.m. **MAP Funding Update**  
Hilton Segler, Past President, Georgia  
Pecan Growers Association, Albany, GA
- 4:45 - 6:00 p.m. **WELCOME RECEPTION**  
in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Saturday Only Registrants)
- 2:00 -5:00 p.m. **EDUCATIONAL SESSIONS**  
Review other Conference Agendas for  
additional education sessions you don't  
want to miss.
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 6:00-7:00 p.m. **RECEPTION**  
at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by 
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers  
to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**

## Blueberry Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Hotel
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION  
BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102  
SITCC**

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 8:30 - 10:15 a.m. **ORGANIC EDUCATIONAL SESSION I  
ORGANIC PRODUCTION  
ROOMS 100/101**
- 8:30 a.m. **Management of Diseases in Organic  
Blueberries**  
Dr. Annemiek Schilder, Michigan State  
University, East Lansing, MI
- 9:15 a.m. **Fertility Management in Organic Production**  
Julia Gaskin, University of Georgia,  
Athens, GA
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Friday Only Registrants)
- 1:00 p.m. **Georgia Blueberry Growers Association  
Business Meeting - Auditorium**  
Mr. Steve Mullis President, Alma, GA
- 1:30 - 4:30 p.m. **BLUEBERRY EDUCATIONAL SESSION I  
Auditorium**  
Moderator: Mark Von Waldner, University  
of Georgia, Pearson, GA
- 1:30 p.m. **Release of a New Early Season, Very Large  
Fruited Rabbiteye Blueberry**  
Dr. Scott NeSmith, University of Georgia,  
Griffin, GA

- 1:50 p.m. **Improving Quality and Yield of Machine  
Harvested Blueberries**  
Dr. Fumimori Takeda, USDA-ARS,  
Kearneysville, WV
- 2:10 p.m. **Economics of Hand and Mechanical Harvest  
of the New "Crispy" Flesh Cultivars from  
Florida**  
Dr. Kim Morgan, MSU, Starkeville, MS
- 2:30 p.m. **BREAK**
- 2:50 p.m. **Experiments with Replanting Blueberry  
Sites in South Georgia**  
Mr. Elvin Andrews, University of Georgia,  
Lakeland, GA; Dr. Phil Brannen, University  
of Georgia, Athens, GA
- 3:10 p.m. **Funky Leaf Spot, Viruses and Xylella Update**  
Dr. Phil Brannen, University of Georgia,  
Athens, GA
- 3:30 p.m. **Surfactants: What They Are and Which  
Chemicals Require Them**  
Mr. John Ed Smith, University of Georgia,  
Alma, GA
- 3:50 p.m. **Update on Stem Blight Research in Florida  
and Georgia**  
Dr. Phil Harmon, University of Florida,  
Gainesville, FL
- 4:10 p.m. **Kimblue (CPPU): A New Growth Regulator  
for Possible Use in Blueberry Fruit Set and  
Fruit Sizing**  
Dr. Gerard Krewer, University of Georgia,  
Tifton, GA
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

Pesticide information on pages 38-39.

## Blueberry Conference

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:00-4:45 p.m. **BLUEBERRY EDUCATIONAL SESSION II**  
**Auditorium**  
Moderator: Eddie McGriff, University of Georgia, Douglas, GA
- 2:00 p.m. **Monitoring and Management of Spotted Wing Drosophila**  
Dr. Oscar Liburd, University of Florida, Gainesville, FL
- 2:20 p.m. **Mummy Berry Disease of Blueberry**  
Dr. Harald Scherm, University of Georgia, Athens, GA
- 2:40 p.m. **Micronutrient Deficiencies in Blueberries and Their Correction**  
Dr. David Kissel, University of Georgia, Athens, GA
- 3:00 p.m. **Blueberry Weed Control with Emphasis on Grasses, Sedges and Smilax**  
Dr. Mark Czarnota, University of Georgia, Griffin, GA
- 3:30 p.m. **BREAK**
- 3:40 p.m. **New Chemicals in the IR-4 Program**  
Mr. Dave Trinka, MBG Marketing, Grand Junction, MI
- 4:00 p.m. **Introduction to the All About Blueberries Web Site**  
Dr. Natalie Hummel, Baton Rouge, LA
- 4:20 p.m. **Perspective 2016**  
Mr. John Shelford, Shelford Associates, Naples, FL
- 2:30 p.m. **TRADE SHOW CLOSES**
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by 
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**

## Food Safety Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION**  
**BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102**  
SITCC

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN** - Riverview Concourse
- 8:00-11:00 a.m. **FOOD SAFETY EDUCATIONAL SESSION I**  
**Rooms 204/205**  
**FOOD SAFETY UPDATE & TRACEABILITY**
- 8:00 a.m. **FDA Regulatory Update**  
Dr. David Gombas, Sr. VP Food Safety and Technology, United Fresh Produce Association, Washington, DC
- 8:30 a.m. **Where are we with Traceability and PTI? Panel Discussion:**  
Dr. David Gombas, Sr. VP Food Safety and Technology, United Fresh Produce Association, Washington, DC;  
Teri Miller, Category Manager, Food Lion, LLC; Dr. Elliot Grant, Chief Marketing Officer, HarvestMark; Mark Shuman, General Manager, Shuman Produce, Inc.
- 10:30 a.m. **Your Questions and Their Answers**
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 4:30 p.m. **FOOD SAFETY EDUCATIONAL SESSION II**  
**Rooms 204/205**  
**FOOD SAFETY RESEARCH & YOUR SOLUTIONS**
- 1:30 p.m. **An Update on GAP Audit Harmonization**  
Beth Bland Oleson, Director of Education, Georgia Fruit & Vegetable Growers Association, LaGrange, GA

- 1:50 p.m. **Applicable Food Safety Research Results for Field, Worker and Packing Facilities**  
Bonnie Fernandez-Fenaroli, Exec. Director, Center for Produce Safety, Davis, CA  
*Come find out the latest and ongoing research to help your operation, from glove sanitation to harvest bins, dump tank water to transportation. You can apply this information to your operation today!*
- 2:30 p.m. **BREAK**
- 2:45 p.m. **What Have You Heard?**  
We want you (the farmers and packing house operators) to share any tips of how your operation has implemented and/or answered food safety programs, issues, etc.
- 3:00 p.m. **Continuation of Applicable Food Safety Research Results for Field, Worker and Packing Facilities**  
Bonnie Fernandez-Fenaroli, Exec. Director, Center for Produce Safety, Davis, CA
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:00-5:00 p.m. **FOOD SAFETY SESSION III**  
**Room 204**  
**GAP/GMP 101**
- 2:00 p.m. **Introduction to Food Safety**  
Beth Bland Oleson, GA Fruit and Vegetable Growers Association, LaGrange, GA

## Roadside Markets

All Activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

Pesticide information on pages 38-39.

### Sponsored by the GA and SC Farm Bureaus

#### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 4:30 p.m. **ROADSIDE MARKETS  
EDUCATIONAL SESSION - Room 102**
- 1:30 p.m. **Welcome**  
Moderators: Chalmers Mikell, South Carolina Farm Bureau, Columbia, SC; Brandon Ashley, Georgia Farm Bureau, Macon, GA
- 1:45 p.m. **The Rock Ranch and GA Agritourism Association**  
Jeff Manley, Manager, The Rock Ranch, The Rock, GA
- 2:20 p.m. **Advertising and Promotions that Sell**  
Ansley Rast Turnblad, Marketing Specialist, SC Department Agriculture, Columbia, SC
- 2:50 p.m. **Funding Sources - USDA Rural Development**  
Walt Woodard, Crown Point Capital Advisors, Watkinsville, GA
- 3:30 p.m. **Food Safety Concerns at Retail Stores and U-Pick Operation**  
Beth Oleson, Director of Food Safety and Education, GFVGA, LaGrange, GA
- 4:00 p.m. **Transitioning from Wholesale to a Retail Market**  
Andy Futch, R & A Orchards, Ellijay, GA
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall
- Evening **DINNER ON YOUR OWN**

Please review other Conference Agenda for additional educational sessions, trade show events, and entertainment opportunities during the Saturday and Sunday Program that you don't want to miss.

## Strawberry Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

#### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION  
BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102**

#### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN** -Riverview Concourse
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Friday Only Registrants)
- 1:30 - 2:40 p.m. **VEGETABLE EDUCATIONAL SESSION III  
Rooms 103/104  
METHYL BROMIDE ALTERNATIVES AND FUMIGATION REGULATIONS**  
Moderator: Glenn Beard, Georgia Cooperative Extension - Colquitt County, Moultrie, GA
- 1:30 p.m. **Disease and Nematode Management with Methyl Bromide Alternatives**  
David Langston, The University of Georgia, Tifton, GA
- 1:50 p.m. **The Most Effective Fumigant/Herbicide Systems for 2011**  
Stanley Culpepper, The University of Georgia, Tifton, GA
- 2:10 p.m. **Fumigant Regulatory Update and Implementation**  
Richard Keigwin, Director of Pesticide Re-evaluation Division of US EPA, Washington, DC
- 3:00 - 4:30 p.m. **VEGETABLE EDUCATIONAL SESSION IV  
Rooms 103/104  
FUMIGATION TRAINING**
- 3:00 p.m. **Fumigant Management Plan - What You Must Know!**  
Dr. Andrew MacRae, University of Florida, Wimauma, FL
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall

#### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event  
Harbor Ballroom - Westin
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and Saturday Only Registrants)
- 2:00-5:00 p.m. **STRAWBERRY EDUCATIONAL SESSION  
Room 203**  
Moderator: Dr. Powell Smith, Extension Associate, Clemson University CES, Lexington County, SC
- 2:00 p.m. **Monitoring and Management of Spotted Wing Drosophila**  
Dr. Oscar Liburd, University of Florida, Gainesville, FL
- 2:25 p.m. **Welcome and Update from the Georgia Strawberry Growers**  
Scott Hart, President, Moultrie, GA
- 2:40 p.m. **Strawberry Transplant Preparation for Annual Plasticulture**  
Dr. Fumiomi Takeda, USDA Appalachian Fruit Research Station, Kearneysville, WV
- 3:05 p.m. **Discussion about Liabilities, Insurance and a Direct Market Operation**  
Beth Crocker, General Counsel, South Carolina Department of Agriculture, Columbia, SC
- 3:30 p.m. **Discussion of Mites and Potential New Insect Problems**  
Dr. Dan Horton, University of Georgia, Athens, GA
- 3:55 p.m. **A Southeast Strawberry Update from Dr. Barclay Poling**  
*Plasticulture to New Varieties, Factors that Influence Strawberry Flavor to Irrigation*  
E. Barclay Poling, Professor Emeritus, North Carolina State University, Raleigh, NC
- Questions and Conclusions**
- 2:00 p.m. **SILENT AUCTION CLOSURE**
- 2:30 p.m. **TRADE SHOW CLOSURE**
- 6:00-7:00 p.m. **RECEPTION**  
at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by 
- 7:00 p.m. **DINNER ON YOUR OWN**

- 2:15 p.m. **Overview of a GAP Program**  
Keith Schneider, University of Florida, Gainesville, FL
- 2:45 p.m. **Overview of a GMP Program**  
Diane Ducharme, North Carolina State University, Kannapolis, NC
- 3:15 p.m. **BREAK**
- 4:00 p.m. **What are Corrective Actions and How to Manage Them?**  
Renee Goodrich Schneider, University of Florida, Gainesville, FL
- 4:15 p.m. **Training Opportunities around the Southeast in 2011**  
Bill Hurst, University of Georgia, Athens, GA; Diane Ducharme, North Carolina State University, Kannapolis, NC; Keith Schneider, University of Florida, Gainesville, FL; Jack Dantzer, South Carolina Department of Agriculture, Columbia, SC
- 2:30 p.m. **TRADE SHOW CLOSURE**
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)   
Reception sponsored by
- Evening **DINNER ON YOUR OWN**

#### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers to discuss industry issues.
- 10:30 a.m. **CONVENTION ADJOURNS**
- HAVE A SAFE TRIP HOME!**

## Watermelon Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION  
BUSINESS OPERATIONS - ROOMS 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102**

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN - Riverview Concourse**
- 8:00-9:00 a.m. **VEGETABLE EDUCATIONAL SESSION I  
PESTICIDE UPDATE AND COMMODITY  
COMMISSION RESEARCH - ROOMS 103/104**  
Please see page 22
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 9:30-11:00 a.m. **VEGETABLE EDUCATIONAL SESSION II  
Rooms 103/104  
SWEET CORN AND GMO CROPS**  
Please see page 22
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Friday Only Registrants)
- 1:30 - 2:40 p.m. **VEGETABLE EDUCATIONAL SESSION III  
Rooms 103/104  
METHYL BROMIDE ALTERNATIVES AND  
FUMIGATION REGULATIONS**  
Please see page 22
- 3:00 - 4:30 p.m. **VEGETABLE EDUCATIONAL SESSION IV  
FUMIGATION TRAINING**  
Please see page 22 - Rooms 103/104
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event
- 8:00-2:30 p.m. **REGISTRATION OPEN**
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Saturday Only Registrants)

- 2:00 -3:00 p.m. **CONCURRENT SESSIONS**
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION V  
Room 102  
BIO-ENERGY**  
Moderator: Tucker Price, Georgia  
Cooperative Extension - Crisp County,  
Cordele, GA
- 2:00 p.m. **Seven Ways to Manage Fruit and  
Vegetable Waste**  
Gary Hawkins, The University of  
Georgia, Tifton, GA
- 2:20 p.m. **Current Research Results from Co-  
Digestion of Culled Fruits and  
Animal Waste**  
Gary Hawkins, The University of  
Georgia, Tifton, GA
- 2:40 p.m. **Why Would a Company Be Interested  
in Using Culled Fruits and Vegetables  
for Producing Renewable Energy?**  
Omar Cruz, Bland Onion, Reidsville, GA;  
Peter Germishuizen, Lewis Taylor Farms,  
Tifton, GA
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION VI  
ONION PRODUCTION - Rooms 103/104**  
Please see page 23
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 3:20 -4:20 p.m. **CONCURRENT SESSIONS**
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VII  
INSECT RELATED ISSUES IN  
VEGETABLES - ROOM 102**  
Please see page 23
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VIII  
DISEASE ISSUES IN VEGETABLES  
Rooms 103/104**  
Moderator: Phillip Edwards, Georgia  
Cooperative Extension - Irwin  
County, Ocilla, GA
- 3:20 p.m. **Differentiation and Integrated  
Management of Tomato Bacterial  
Speck and Spot**  
Gary Vallad, University of Florida,  
Wimauma, FL
- 3:40 p.m. **Research Update on Managing  
Phytophthora Blight on Vegetables**  
Pingsheng Ji, The University of Georgia,  
Tifton, GA
- 4:00 p.m. **Watermelon Diseases and Their  
Management**  
David Langston, The University of  
Georgia, Tifton, GA
- 6:00-7:00 p.m. **RECEPTION**  
at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by 

## Sweet Corn Conference

Pesticide information on pages 38-39.

All activities at the Savannah International Trade & Convention Center (SITCC) unless otherwise noted.

### THURSDAY, JANUARY 6, 2011

- 7:30 - 5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse  
Exhibitor and Poster Set-Up
- 12:00 p.m. **GFVGA BOARD OF DIRECTORS MEETING**  
Westin Savannah Harbor
- 1:30 - 5:00 p.m. **SE REGIONAL EDUCATIONAL SESSION  
BUSINESS OPERATIONS - Rooms 103/104**
- 5:00 p.m. **GFVGA ANNUAL MEETING - Room 102  
SITCC**

### FRIDAY, JANUARY 7, 2011

- 7:00-5:00 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 8:00-9:00 a.m. **VEGETABLE EDUCATIONAL SESSION I  
Rooms 103/104  
PESTICIDE UPDATE AND COMMODITY  
COMMISSION RESEARCH**  
Please see page 22
- 9:00-6:15 p.m. **TRADE SHOW OPEN**
- 9:30-11:00 a.m. **VEGETABLE EDUCATIONAL SESSION II  
Rooms 103/104  
SWEET CORN AND GMO CROPS**  
Moderator: Justin Shealey, Georgia  
Cooperative Extension - Echols County,  
Statenville, GA
- 9:30 a.m. **Biotech Acceptance and Vegetables**  
Paulette Pierson, Industry Affairs Lead for  
Vegetables, Monsanto, St. Louis, MO
- 10:00 a.m. **B.t. Sweet Corn and New Insecticides for  
Management of Caterpillar Pests of Sweet  
Corn**  
Stormy Sparks, The University of Georgia,  
Tifton, GA
- 10:30 a.m. **Management Programs for Foliar Diseases  
of Sweet Corn**  
Richard Raid, University of Florida,  
Belle Glade, FL
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Friday Only Registrants)
- 1:30 - 2:40 p.m. **VEGETABLE EDUCATIONAL SESSION III  
Rooms 103/104  
METHYL BROMIDE ALTERNATIVES AND  
FUMIGATION REGULATIONS**  
Please see page 22

- 3:00 - 4:30 p.m. **VEGETABLE EDUCATIONAL SESSION IV  
FUMIGATION TRAINING - ROOMS 103/104**  
Please see page 22
- 4:45 - 6:00 p.m. **WELCOME RECEPTION** in Trade Show Area  
(Open to all registered attendees)
- 5:45 p.m. **LIVE AUCTION** in Exhibit Hall

### SATURDAY, JANUARY 8, 2011

- 8:00 a.m. **AWARDS BREAKFAST** - Ticketed Event
- 8:00-2:30 p.m. **REGISTRATION OPEN**  
Riverview Concourse
- 9:00-2:30 p.m. **TRADE SHOW OPEN**
- 12:00-1:30 p.m. **LUNCH** in the Trade Show  
(Lunch provided for Four Day and  
Saturday Only Registrants)
- 2:00 -3:00 p.m. **CONCURRENT SESSIONS**
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION V  
BIO-ENERGY - Room 102**  
Please see page 23
- 2:00-3:00 p.m. **VEGETABLE EDUCATIONAL SESSION VI  
ONION PRODUCTION - ROOMS 103/104**  
Please see page 23
- 2:00 p.m. **SILENT AUCTION CLOSES**
- 2:30 p.m. **TRADE SHOW CLOSES**
- 3:00 p.m. **BREAK**
- 3:20 -4:20 p.m. **CONCURRENT SESSIONS**
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VII  
INSECT RELATED ISSUES IN  
VEGETABLES - ROOM 102**  
Please see page 23
- 3:20-4:20 p.m. **VEGETABLE EDUCATIONAL SESSION VIII  
DISEASE ISSUES IN VEGETABLES  
ROOMS 103/104**  
Please see page 23
- 6:00-7:00 p.m. **RECEPTION** at the Westin Savannah Harbor  
(Open to All Attendees)  
Reception sponsored by 
- Evening **DINNER ON YOUR OWN**

### SUNDAY, JANUARY 9, 2011

- 8:00-8:30 a.m. **WORSHIP SERVICE**  
Westin Savannah Harbor
- 8:30 a.m. **INDUSTRY ROUNDTABLE** (all associations)  
Westin Savannah Harbor  
Continental breakfast with fellow growers  
to discuss industry issues.

**THE FAB FOUR**

**CHARGER**

**TRIBUTE**

**SWEET HEARTS**

**SWEET TREATS**

Sakata presents the Fabulous Four—these varieties really love to perform! Producing high yields, uniform shape and size, disease resistance and long shelf-life. You'll be screaming for more as Sakata delivers an award performance in your market. Sakata has no problem performing at its highest level—on any stage!

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## Pesticide & CCA Credits

### BLUBERRY ED SESSION I

1/7/2011 • 1:30 - 4:30 PM  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11324 Credits: 3  
Georgia: R10 - 602 1 21; 1  
North Carolina: 2765 411079 1 - N,O,D,X  
South Carolina: Credits: 1 11965 Cat. 3  
Tennessee: 17393 C01-3; C10-3; C12-3

### BLUBERRY ED SESSION II

1/8/2011 • 2:00 - 4:45 PM  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11325 Credits: 3  
Georgia: R10 - 603 1 21; 1  
North Carolina: 2765 411084 1 - N,O,D,X  
South Carolina: Credits: 1.5 11966 Cat. 3  
Tennessee: 17394 C01-3; C10-3; C12-3

### FOOD SAFETY ED SESSION I - FOOD SAFETY UPDATES & TRACEABILITY

1/7/2011 • 8:00 - 11:00 AM  
Georgia Certified Crop Advisor (CCA): GA-02186 - CM 2.5  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Tennessee: 17392 C01-3; C10-3; C12-3

### FOOD SAFETY ED SESSION II - FOOD SAFETY RESEARCH & YOUR SOLUTIONS

1/7/2011 • 1:30 - 4:30 PM  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Tennessee: 173943 C01-3; C10-3; C12-3

### FOOD SAFETY ED SESSION III - GAP/GMP 101

1/8/2011 • 2:00 - 5:00 PM  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Tennessee: 17394 C01-3; C10-3; C12-3

### MUSCADINE ED SESSION I

1/8/2011 • 2:00 - 4:30 PM  
Georgia Certified Crop Advisor (CCA): GA-02184 - CH 0.5  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11328 Credits: 3  
Tennessee: 17394 C01-3; C10-3; C12-3

### NARBA GENERAL SESSION - PEST MANAGEMENT

1/6/2011 • 9:00 - 12:00 noon  
Georgia Certified Crop Advisor (CCA): GA-02167 - PM 1.0; CM 1.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Georgia: R10 - 587 1 21; 1  
North Carolina: 2763 411077 2.5 - N,O,D,X

### NARBA ED SESSION I - TRELLISING / DISEASE UPDATES

1/6/2011 • 2:00 - 4:00 PM  
Georgia Certified Crop Advisor (CCA): GA-02168 - PM 1.0; CM 2.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Georgia: R10 - 588 1 21; 1  
North Carolina: 2763 411077 2.5 - N,O,D,X  
South Carolina: Credits: 1 11948 Cat. 5  
Tennessee: 17390 C01-3; C10-3; C12-3

### NARBA ED SESSION II - HIGH TUNNELS / MARKETING

1/6/2011 • 2:00 - 4:00 PM  
Georgia Certified Crop Advisor (CCA): GA-02169 - CM 2.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
North Carolina: 411077 2763 2.5 - N,O,D,X

### NARBA ED SESSION III - BERRY FUNDAMENTALS

1/6/2011 • 2:00 PM  
Georgia Certified Crop Advisor (CCA): GA-01270 - CM 3.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
North Carolina: 2763 411077 2.5 - N,O,D,X  
South Carolina: Credits: 0.5 11949 Cat. 5  
Tennessee: 17390 C01-3; C10-3; C12-3

### NARBA ED SESSION V - GROWER INFORMATION

1/7/2011 • 9:00 - 11:00 AM  
Georgia Certified Crop Advisor (CCA): GA-02171 - CM 0.5  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11329 Credits: 2  
North Carolina: 2763 411083 1 - N,O,D,X  
Tennessee: 17391 C01-2; C10-2; C12-2

### NARBA ED SESSION VI - COMMERCIAL BLACKBERRY TRACK

1/7/2011 • 1:30 - 4:30 pm  
Georgia Certified Crop Advisor (CCA): GA-02172 - CM 3.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11330 Credits: 3  
North Carolina: 2763 411083 1 - N,O,D,X  
South Carolina: Credits: 0.5 11950 Cat. 5

### NARBA ED SESSION VII - THE "DIRT TRACK"

1/7/2011 • 1:30 - 4:30 PM  
Georgia Certified Crop Advisor (CCA): GA-02173 - NM 1.0; SW 1.5; PM 0.5;  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Georgia: R10 - 589 1 21; 1  
North Carolina: 2763 411083 1 - N,O,D,X  
South Carolina: Credits: 0.5 11963 Cat. 3

### ORGANIC ED SESSION I - ORGANIC PRODUCTION

1/7/2011 • 8:30 - 10:15 am  
Georgia Certified Crop Advisor (CCA): GA-02180 - NM 0.5; PM 0.5; CM 0.5  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11332 Credits: 2  
Georgia: R10 - 599 1 21; 1  
North Carolina: 2762 411076 2 - N,O,D,X  
South Carolina: Credits: 1 11963 Cat. 3  
Tennessee: 17392 C01-3; C10-3; C12-3

### ORGANIC ED SESSION II -

#### EFFICIENT PRACTICES TO INCREASE PROFITABILITY

1/7/2011 • 10:45 - 12:00 PM  
Georgia Certified Crop Advisor (CCA): GA-02181 - CM 1.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
North Carolina: 2762 411076 2 - N,O,D,X  
Tennessee: 17392 C01-3; C10-3; C12-3

### ORGANIC ED SESSION III - INSECT PEST MANAGEMENT

1/7/2011 • 1:30 - 3:00 PM  
Georgia Certified Crop Advisor (CCA): GA-02182 - PM 1.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Florida: 11334 Credits: 1.5  
Georgia: R10 - 600 1 21; 1  
North Carolina: 2762 411076 2 - N,O,D,X  
South Carolina: Credits: 1 11962 Cat. 3  
Tennessee: 17393 C01-3; C10-3; C12-3

### ORGANIC ED SESSION IV - MARKETING

1/7/2011 • 3:15 - 4:45 PM  
Georgia Certified Crop Advisor (CCA): GA-02183 - CM 1.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
North Carolina: 2762 411076 2 - N,O,D,X  
Tennessee: 17394 C01-3; C10-3; C12-3

### PEACH ED SESSION I - RECOGNIZING STRESS FACTORS

1/7/2011 • 8:00 - 11:30 AM  
State or Organization Approval:  
Georgia Certified Crop Advisor (CCA): GA-02174 - NM 0.5; PM 1.5; CM 1.0  
Alabama: 10 Recertification Pts. (AP, D&R, REG)  
Georgia: R10 - 590 2 21; 2  
North Carolina: 2760 411074 4 - N,O,D,X  
South Carolina: Credits: 0.5 11951 Cat. 5  
Tennessee: 17392 C01-3; C10-3; C12-3

# Pesticide & CCA Credits

## PEACH ED SESSION II - ORCHARD STRESS MGT.

1/7/2011 • 2:00 - 4:00 PM  
 Georgia Certified Crop Advisor (CCA): GA-02175 - PM 2.5  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Georgia: R10 - 591 2 21; 2  
 North Carolina: 2760 411074 4 - N,O,D,X  
 South Carolina: Credits: 2.5 11952 & 11953 2-C3; 0.5-C5  
 Tennessee: 17393 C01-3; C10-3; C12-3

## PEACH ED SESSION III - GENERAL ISSUES IN FRUIT PRODUCTION

1/8/2011 • 2:00 - 4:45 PM  
 Georgia Certified Crop Advisor (CCA): GA-02176 - PM 0.5; CM 1.0  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Georgia: R10 - 592 2 21; 2  
 North Carolina: 2760 411082 1 - N,O,D,X  
 South Carolina: Credits: 0.5 11954 Cat. 3  
 Tennessee: 17394 C01-3; C10-3; C12-3

## PECAN EDUCATIONAL SESSION I

1/7/2011 • 10:00 - 12:00 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11326 Credits: 2  
 Georgia: R10 - 601 1 21; 1  
 North Carolina: 2764 411078 0.5 - N,O,D,X  
 Tennessee: 17392 C01-3; C10-3; C12-3

## PECAN ED SESSION II

1/7/2011 • 1:30 - 4:30 PM  
 Georgia Certified Crop Advisor (CCA): GA-02185 - SW 0.5  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11327 Credits: 3  
 North Carolina: 2764 411079 0.5 - N,O,D,X  
 Tennessee: 17393 C01-3; C10-3; C12-3

## ROADSIDE MARKETS EDUCATIONAL SESSION

1/7/2011 • 1:30 - 4:30 PM  
 Georgia Certified Crop Advisor (CCA): GA-02187 - CM 1.0  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Tennessee: 17393 C01-3; C10-3; C12-3

## SE REGIONAL ED SESSION - BUSINESS OPERATIONS

1/6/2011 • 1:30 - 5:00 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Tennessee: 17393 C01-3; C10-3; C12-3

## STRAWBERRY EDUCATIONAL SESSION

1/8/2011 • 2:00 - 5:00 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11322 Credits: 3  
 Georgia: R10- 604 1 21 1  
 North Carolina: 2766 411080 1 N,O,D,X  
 South Carolina: Credits: 1 11967 Cat. 5  
 Tennessee: 17394 C01-3; C10-3; C12-3

## VEGETABLE SESSION I - PESTICIDE UPDATE / COMMODO.

**COMM. RESEARCH**  
 1/7/2011 • 8:00 - 9:00AM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11303 Credits: 1  
 Georgia: R10 - 593 2 21; 2  
 North Carolina: 2761 411075 4.5 - N,O,D,X  
 South Carolina: Credits: 1 11955 Cat. 3  
 Tennessee: 17392 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION II - SWEET CORN & GMO CROPS

1/7/2011 • 9:30 - 11:00AM  
 Georgia Certified Crop Advisor (CCA): GA-02177 - PM 1.5  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11304 Credits: 1.5  
 Georgia: R10 - 594 1 21; 1  
 North Carolina: 2761 411075 4.5 - N,O,D,X  
 South Carolina: Credits: 1.5 11956 Cat. 3  
 Tennessee: 17392 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION III - METHYL BROMIDE ALTERNATIVES & FUMIGATION REGULATIONS

1/7/2011 • 1:30 - 2:40 PM  
 Georgia Certified Crop Advisor (CCA): GA-02178 - PM 0.5  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11306 Credits: 1  
 Georgia: R10 - 595 2 21; 2  
 North Carolina: 2761 411075 4.5 - N,O,D,X  
 South Carolina: Credits: 1 11957 Cat. 3  
 Tennessee: 17393 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION IV - FUMIGATION TRAINING

1/7/2011 • 3:00 - 4:30 PM  
 Georgia Certified Crop Advisor (CCA): GA-02179 - PM 1.5  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11307 Credits: 1.5  
 Georgia: R10 - 596 1 21; 1  
 North Carolina: 2761 411075 4.5 - N,O,D,X  
 South Carolina: Credits: 1.5 11958 Cat. 3  
 Tennessee: 17394 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION V - BIO-ENERGY

1/8/2011 • 2:00 - 3:00 PM  
 Alabama • 10 Recertification Pts. (AP, D&R, REG)  
 North Carolina: 2761 411081 2 - N,O,D,X  
 Tennessee: 17394 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION VI - ONION PRODUCTION

1/8/2011 • 2:00 - 3:00 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11309 Credits: 1  
 North Carolina: 2761 411081 2 - N,O,D,X  
 Tennessee: 17394 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION VII - INSECT RELATED ISSUES IN VEGETABLES

1/8/2011 • 3:20 - 4:20 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11310 Credits: 1  
 Georgia: R10- 597 1 21; 1  
 North Carolina: 2761 411081 2 - N,O,D,X  
 South Carolina: Credits: 1 11959 Cat. 3  
 Tennessee: 17394 C01-3; C10-3; C12-3

## VEGETABLE ED SESSION VIII - DISEASE ISSUES IN VEGETABLES

1/8/2011 • 3:20 - 4:20 PM  
 Alabama: 10 Recertification Pts. (AP, D&R, REG)  
 Florida: 11311 Credits: 1  
 Georgia: R10 - 598 1 21; 1  
 North Carolina: 2761 411081 2 - N,O,D,X  
 South Carolina: Credits: 1 11960 Cat. 3  
 Tennessee: 17394 C01-3; C10-3; C12-3



# Georgia Counties Map



**Southern AgriBusiness Services**

**2-Day Agronomic Seminar**

January 19, 2011

Perry, GA

Requested CEUs

7:10.... Welcome and Announcements	
7:20; Georgia and International CCA Update <i>Conrad Lavender, Agronomist, Southern AgriBusiness Services, Jefferson</i>	0.5 PD
7:50 – 8:20. A to Z Technologies <i>Conrad Lavender</i>	0.5CM
8:20 – 9:10 Future of Land-Grant Universities <i>Dr. Scott Angle, Dean –UGA -College of Agriculture and Environmental Sciences(CAES), Athens</i>	1.0CM
9:10 -9:20. Break	
<hr/>	
9:20- 11:10. Managing Nutrients in Differing Forage Systems for Soil Quality <i>Dr. Dennis Hancock, Forage Specialist, UGA- CAES,-, Athens</i>	0.5NM, 1.5.SW
<hr/>	
11:10 – 11:20. Break	
11:20 -12:10. Precision Ag Water Placement and Management In Practice <i>Dr. Calvin Perry, Superintendent, C.M. Stripling Irrigation Center, Camilla</i>	1.0SW
<hr/>	
12:10 – 1:10. Lunch	
<hr/>	
1:00 – 1:50. Plant Nutrient Supply Update & 2010 Soil Test Summary <i>Dr. Terry Roberts, President - International Plant Nutrient Institute, Atlanta</i>	1.0NM
<hr/>	
1:50 – 2:40. . Update of Plant Nutrient Research and Recommendations <i>Dr. Glen Harris, Agronomist-Fertility Specialist,, UGA-CAES, Tifton</i>	1.0NM
2:40- 2:50. Break	
<b>Food Safety</b>	3.0 PM
Speakers: <i>Beth Bland Oleson –Food Safety Director, Georgia Fruit and Vegetable Association, La Grange</i> <i>Dr. Oscar Garrison - Division Director, Consumer Protection, GA Department of Agriculture, Atlanta</i>	
Food Safety Overview	Food Safety and Procedures 101
Federal law versus GA law?	Who will be affected?
What is required to be in compliance?	
Preparing for a Food Safety Audits!	
Importance of Good Record Keeping!	
5:40 – Announcement and Adjourn	

	<u>NM</u>	<u>SW</u>	<u>IPM</u>	<u>CM</u>	<u>PD</u>
Total Requested CEUs	2.5	2.5	3.0	1.5	0.5

**Southern AgriBusiness Services**

**2-Day Agronomic Seminar**

January 20, 2011

Perry., GA

Requested CEUs

7:10.... Welcome and Announcements  
*Conrad Lavender*

7:10 – 8:10. Cotton Variety Performance & Changes to PGR  
Management”

0.5NM, 0.5CM

*Dr. Guy Collins, Cotton Extension Specialist, UGA-CAES, Tifton*

8:10 – 9:00. . “Need for Changes in Agriculture?

0.5NM, 0.5CM

*Dr. Noble Usherwood, President, Agri-Tech Services, Madison, GA*

9:00– 9:10.Break

9:10 – 10:00. Bio-Mass Crops for Bio-Fuel

1.0CM

*Dr. Dewey Lee, Agronomist- Grains, UGA- CAES, Tifton*

10:00 – 11:00. Physiological, Nutritional and Disease Disorders of Tomatoes

0.5PM, 0.5NM

*Dr. Steve Olson, Vegetable Specialist, University of Florida – North Florida REC- Quincy*

11:00 -12:20. Managing Nutrient in Sod Based Cropping Systems

1.5NM

*Dr. David Wright, Agronomist, University of Florida - North Florida REC, Quincy*

12:20 – 1:10. Lunch

1:10 – 3:20. Georgia State Water Plan: Update:

2.5SW

Participates:

*Cliff Lewis, Acting Assistant Branch Chief - Satilla, St. Mary’s, Suwannee & Ochlocknee Basins*

*Alice Keyes, Planning and Policy, GA, DNR, Atlanta*

*Dr. Jim Hook, Professor, UGA-CAES,-NESPAL, Tifton*

3:20 -3:30. Break

3:30-5:40

**Seed Technology Update**

1.5 IPM, 0.5CM

Participates:

*Kevin Phillips and Mike Hughes - Pioneer Seed*

*Josh Mayfield – Bayer Crop Science*

*Joe Napier – Syngenta*

*Ty Fowler – Deltapine*

4:30- 4:40. Break

5:40.Closing comments

	<u>NM</u>	<u>SW</u>	<u>IPM</u>	<u>CM</u>	<u>PD</u>
Total Requested CEUs	2.5	2.5	2.0	3.0	0.0

***Have a Safe Trip Home!***

**Guest Speakers:**

**Dr. Scott Angle**

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**Dr. Terry L. Roberts**  
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International Plant Nutrient Institute  
3500 Parkway Lane, Suite 550  
Norcross, GA 30092 USA  
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---

**Dr. Noble Usherwood**  
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**Dr. David Wright**  
Agronomist – Small Grains  
University of Florida  
North Florida REC – Quincy  
155 Research road  
Quincy, FL 32351-5677  
(850)875-7119  
Email: wright@ufl.edu



January 23-25, 2011

Perdido Beach Resort  
Orange Beach, Alabama

#### OFFICERS

**Leondard Kichler**, President

**Aaron Silva**, Vice President

**Randle Wright**, Treasurer

**Charles Walker**, Executive Secretary

#### DIRECTORS

**Terris Matthews**, Arkansas

**Nelson Bordelon**, Louisiana

**Jamie Earp**, Mississippi

**Benny Patten**, New Jersey

**George Wooten**, North Carolina

**Norman Brown**, North Carolina

**Jerry Gallop**, South Carolina

**Don Kerr**, Tennessee

**Preston Davis**, Virginia

#### THANKS TO OUR EXHIBITORS

Grass Works  
Linda Reid  
Phone:  
Email:

Strickland Bros Enterprises, Inc.  
Andrew Strickland  
Phone: (252) 478-3058  
Email: [andrew@stricklandbros.com](mailto:andrew@stricklandbros.com)

49<sup>th</sup> Annual Convention of the United States Sweet  
Potato Council, Inc.

THANKS TO OUR EXHIBITORS

Jet Harvest Solutions  
 Bill Grant  
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First South Farm Credit  
 Charles Rocconi  
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H2A Complete LLC  
 Royce Hefty  
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 Email: [rhefty@h2acomplete.com](mailto:rhefty@h2acomplete.com)

Bag Supply  
 Dennis Limbaugh  
 Phone:  
 Email: [dlimbaugh@bagsupply.com](mailto:dlimbaugh@bagsupply.com)

SATURDAY, January 22, 2011

3:00 PM – 6:00 PM Hospitality Suite Open  
 Grand Reef Room  
 Sponsor:  
 J L Bell LLC/Plato Industries

SUNDAY, January 23, 2011

1:00 PM – 6:00 PM Exhibitor Setup  
 Grand Point

1:00 PM – 5:00 PM Registration

1:00 PM – 5:00 PM Golf Outing  
 Meet at Registration Desk

2:00 PM – 4:00 PM Board of Directors  
 Meeting at  
 Board Room

2:00 PM – 5:00 PM Hospitality Room Open  
 Grand Reef Room  
 Sponsor:  
 J L Bell LLC/Plato Industries

7:00 PM – 10:00 PM President's Reception  
 Salon DEFGH  
 Sponsor:  
 Baldwin County Farmers Federation Inc.

MONDAY, January 24, 2011

7:00 AM Exhibitor Setup  
 Grand Point

7:00 AM – 8:30 AM Buffet Breakfast  
 Grand Point View  
 Sponsor:  
 Bruce Foods Corporation

MONDAY, January 24, 2011

7:30 AM Welcome, Presentation of  
 Colors, Door prizes,  
 Announcements

7:30 AM – 12:00 PM Registration

8:30 AM – 12:00 PM Exhibits Open  
 Grand Point

9:00 AM – 12:00 PM General Session  
 Salon DEFGH

Program Moderator  
 Arnold Caylor

9:00 AM – 9:15 AM Welcome and Opening  
 Comments  
 Dr. Bill Bachelor

Dean and Director: College of Agriculture and  
 Alabama Agricultural Experiment Station Auburn University

9:15 AM - 9:35 AM Food Safety  
 Ms. Beth Bland  
 Program Director  
 GA. Fruit & Vegetable Growers Assn.

9:35 AM – 9:55 AM Food Safety  
 Dr. Chris Gunter  
 Vegetable Production NCSU

9:55 AM – 10:15 AM South AL Sweet Potato  
 Production  
 Mr. Bill Penry

10:15 AM – 10:45 AM Refreshment Break  
 Sponsor:  
 Eva Bank, Freedom Insurance Agency

THANKS TO OUR EXHIBITORS

FMC Corporation  
 Susan Atwater  
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 Kevin Pinelli  
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 Don Walborn  
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**THANKS TO OUR EXHIBITORS**

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Exeter Engineering Inc.  
 Eddie Reynoso  
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 Email: [ereynoso@exeter-engineering.com](mailto:ereynoso@exeter-engineering.com)

Industrial Ventilation, Inc.  
 Steven Parkinson  
 Phone: (541) 591-0892  
 Email: [sparkinson@ivf-air.com](mailto:sparkinson@ivf-air.com)

Bay Wood Products  
 Sherise Bates  
 Phone:  
 Email: [Sherisef@bay-wood-products.com](mailto:Sherisef@bay-wood-products.com)

J & M Industries  
 Tommy Pratt  
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 Email: [tp Pratt@m-ind.com](mailto:tp Pratt@m-ind.com)

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 Julie Haider  
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 Email: [Julie.haider@cray.com](mailto:Julie.haider@cray.com)

Mechanical Transplanter Co. LLC  
 Dan Timmer  
 Phone: (616) 396-8738  
 Email: [mtc@agL.net](mailto:mtc@agL.net)

10:45 AM – 11:45 AM SCRI Advisory  
 Committee Meeting **Break out session**

Dr. Tara Smith  
 Director Chase Sweet  
 Potato Station LSU

10:45 AM – 11:15 AM Vendor Presentations

11:35 AM – 11:50 AM State Highlights  
 Alabama, Arkansas, California,  
 Georgia, Louisiana, Canada

12:00 PM – 1:30 PM Lunch  
 Grand Point View  
 Sponsored:  
 Federer Fertilizer, Vision Bank, Ag World Support Systems LLC

1:30 PM – 4:00 PM TOUR *Don't be late*  
 Naval Air Museum

2:00 PM – 4:00 AM Board of Directors  
 Meeting (If needed)  
 Board Room

4:00 PM – 11:00 PM Hospitality Room Open  
 Grand Reef Room  
 Sponsor:  
 J L Bell LLC/Plato Industries

Evening Free

**TUESDAY, January 25, 2011**

7:00 AM – 8:30 AM Buffet Breakfast  
 Grand Point View  
 Sponsor:  
 Bright Harvest Sweet Potato Co, Inc.

8:30 AM – 12:00 PM Exhibits Open  
 Grand Point

9:00 AM – 12:00 PM General Session  
 Salon DEFGH

Program Moderator  
 James Miles  
 Commercial Horticultural Agent

9:00 AM – 9:15 AM Update on Sweet  
 Potato Disorders  
 Dr. Chris Clark  
 Plant Pathology LSU

9:15 AM – 9:35 AM Herbicide Injury Symptoms  
 on Sweet Potatoes  
 Dr. Mark Shankle  
 Pontotoc Res. & Ext. Center  
 Mississippi State University

9:35 AM – 10:15 AM Update on Process  
 Sweet Potato Products  
**TBA**

10:15 AM – 10:45 AM Refreshment Break  
 Sponsor:

10:45 AM – 11:05 AM American Heart  
 Associations  
 Ms. April Whitfield

11:20 AM – 11:40 AM State Highlights Mississippi, New Jersey,  
 North Carolina, South Carolina, Texas, Virginia

11:40 AM - 12:00 PM Business Session  
 Charles Walker  
 Executive Secretary  
 United States Sweet Potato Council

**THANKS TO OUR SPONSORS**

Eva Bark  
 Cullman, AL 35055

Freedom Insurance  
 Gloria Williams  
 Cullman, AL 35058

Federer Fertilizer  
 Melba Jo Federer  
 Cullman, AL 35057

Bright Harvest Sweet Potato Company

Phone:  
 Email:

Cullman County Farmers Federation, Inc.  
 P.O. Box 1069  
 Cullman, AL 35055

Elberta Farmers CO-OP  
 Elberta, AL 35055

Foley Implement Company, Inc.  
 Foley, AL 36535

**THANKS TO OUR SPONSORS**

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Ag World Support Systems  
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JL Bell LLC/Plato Industries  
 Jason Bell  
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Bruce Foods  
 Norman Brown, Jr.  
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Baldwin County Farmers Federation Inc.  
 P.O. Box 2298  
 Robertsdale, AL 36567

12:00 PM – 1:00 PM Lunch  
 Grand Point View

1:30 PM – 2:30 PM Food Safety Work Shop  
 Dr. Chris Gunter (NCSU) & Ms. Beth Bland  
 GA. Fruit & Vegetable Growers Assn.

Afternoon Free

7:00 PM – 10:00 PM Banquet

*Speaker*  
 Commissioner of Agriculture  
 John McMillan

Entertainment:

*Sponsor:*  
 ConAgra Foods Lamb Weston

**Spouses' Agenda**

**SATURDAY, January 22, 2011**

3:00 PM – 6:00 PM Hospitality Suite Open  
 Grand Reef Room  
*Sponsor:*  
 J.L. Bell LLC/Plato Industries

**SUNDAY, January 23, 2011**

1:00 PM – 5:00 PM Registration Desk

2:00 PM – 5:00 PM Hospitality Room Open  
 Grand Reef Room

7:00 PM – 10:00 PM President's Reception  
 Salon DEFGH

**MONDAY, January 24, 2011**

8:30 AM Board Buses for Shopping  
 Hotel Lobby

12:00 NOON Lunch Wolf bay Log

1:30 PM – 4:00 PM

Evening Free

4:00 PM – 11:00 PM Hospitality Room Open  
 Grand Reef Room

**TUESDAY, January 25, 2011**

8:30 AM

12:00 Noon Lunch

Afternoon Free

7:00 PM – 10:00 PM Banquet

*Speaker*  
 Commissioner of Agriculture  
 John McMillan

Entertainment:

*Sponsor:*  
 ConAgra Foods Lamb Weston



**2011 GWA Annual Meeting  
Education Session**

**Saturday, January 29, 2011**

**8:30 AM Educational Seminar (8:30AM - 11:00AM)**

- |               |  |
|---------------|--|
| 8:30 AM       | Sausage/biscuits – coffee – juice  |
| 8:45 – 9:15   | <b>Watermelon Varieties Updates</b><br>Dr. Jonathan R. Schultheis, Professor, Departmental Extension Leader – Hort. Science, NC State University             |
| 9:15 – 9:25   | <b>Research Updates</b><br>Tucker Price, County Extension Agent, Crisp County, GA  |
| 9:25 – 9:45   | <b>Managing Phytophthora Fruit Rot of Watermelon</b><br>C.S. Kousik, Ph.D., Research Plant Pathologist, US Vegetable Laboratory, USDA-ARS                    |
| 9:45 – 10:15  | <b>Watermelon Pollination &amp; Considerations</b> Dr. Jonathan R. Schultheis, Professor, Departmental Extension Leader – Hort. Science, NC State University |
| 10:15 – 10:45 | <b>Food Safety &amp; Legislative Updates</b><br>Beth Oleson, Director of Education, GFVGA<br>Charles Hall, GWA Executive Director                            |

# 2011 Alabama Fruit and Vegetable Conference Agenda

## Student Center, Auburn University

*Joint effort between the Commercial Horticulture Team of the Alabama Cooperative Extension System and the Alabama Fruit and Vegetable Growers Association.*

### Friday, February 11, 2011

**1:00 – 1:30 pm:** Gather at Ham Wilson Livestock Arena, 650 South Donahue Dr., located a short distance north of ALFA Plant and Soil diagnostic facility and just north of Morrison Dr. and Donahue to take a shuttle for a tour of Jordan-Hare Stadium Athletic Turfgrass Management and more. Last shuttle leaves at 1:30. Don't miss this fun and informative tour!

**5:00 pm:** Conference Barbecue Supper, Ham Wilson Livestock Arena. Enjoy BBQ while you visit with fellow AFVGA members and exhibitors.

### Saturday, February 12, 2011

#### **Conference Educational Sessions**

**7:30 am:** Registration Begins, AU Student Center (located just east of Jordan-Hare Stadium) walking distance from parking areas.

Parking: From Donahue Dr., turn right onto Heisman Dr. and enter parking deck (levels 1,2,or 3) to your right. Additional parking next to Beard-Eaves Memorial Coliseum if needed.

#### **8:00 am Welcome – Ball Room A (Third Floor)**

#### **8:30 – 10:00 am Educational Sessions**

##### ***Session I - Ball Room B***

**Food Safety and Good Agricultural Practices** - Dr. Jean Weese, Auburn Univ.; Mrs. Beth Bland-Oleson, Georgia Fruit and Vegetable Association; and Mr. Steve Carpenter, Producer, AFVGA member

**This session will provide growers with an understanding of what food safety is all about; food-borne pathogens of concern, good agricultural practices, and what you need to know in order to prepare and complete a food safety audit process.**

##### ***Session II - Room 2222***

**Greenhouse and Hydroponic Systems for Production of Fruit and Vegetables** - Mr. Bob Hochmuth, Regional Extension Agent, IFAS, Univ. Florida

**Throughout the state growers are using or considering using greenhouses for production of fruits and vegetables. In this session producers will be introduced to various crops and cropping systems for greenhouse and hydroponic systems of production, and to some of the hurdles to overcome in greenhouse and hydroponic production.**

##### ***Session III - Room 2223***

**Soil Improvement Using Cover Crops and Soil Fumigation Alternatives** - Mr. Mike Reeves, Mr. Richard Petcher, Regional Extension Agents, Alabama Cooperative Extension System and Mr. Arnold Caylor, Director, North Alabama Research Center, Alabama Agricultural Experiment Station

Good production begins with your soil. Improving soil fertility and structure should be our aim and cover crops can be an important part of a fertility management program. This session will provide education on various cover crops, like sun hemp, and their benefits to our production systems.

Major changes in soil fumigation have taken place, and alternatives as well as new regulations when using soil fumigants will be discussed.

**10:00 am Break and Visit With Exhibitors/Vendors – Ball Room A (Third Floor)** Please visit and support our vendors.

**10:30 am– 12:00 am Educational Sessions**

***Session IV - Room 2222***

**Sheltered Production of Horticultural Crops** - Mr. Bobby Boozer, Auburn Univ.; Dr. Jackie Robbins, Irrigation-Mart; Dr. Wheeler Foshee, Auburn Univ., and Mr. Chazz Hesselein, Auburn Univ., ACES

Sheltered production is getting a great deal of attention and many producers are just beginning to gain some experience. This session will focus on high tunnel production benefits and challenges, and cover other topics such as irrigation management, insect and disease issues, crop experiences, cut flower production, and grower experiences.

***Session V - Room 2223***

**Fruit and Vegetable Variety Updates** - Dr. Elina Coneva, Dr. Jay Spiers, Mr. Edgar Vinson, Mr. Allen Burnie, Dept. of Horticulture; and Mr. Doug Chapman, Regional Extension Agent, Alabama Cooperative Extension System

What's new in fruit and vegetable varieties will be covered in this session. Crops and varieties will be highlighted during the talks and information sheets provided to update producers and get them looking at new or newer varieties for the farm.

***Session VI - Ball Room B***

**Pest Management Updates** - Dr. Ayanava Majumdar and Dr. Ed Sikora, Auburn University, ACES

What season does not bring along issues dealing with insects and diseases? Updates critical to producers for pest management will be discussed during this session.

**12:00 – 1:00 pm LUNCH- Ball Room A, *TICKET REQUIRED***

**1:00 – 1:20 PM AFVGA GENERAL BUSINESS MEETING**

**1:30 – 3:00 pm Educational Sessions**

### ***Session I - Ball Room B***

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Major changes in soil fumigation have taken place, and alternatives as well as new regulations when using soil fumigants will be discussed.

**3:00 Break And Visit With Exhibitors/Vendors – Ball Room A.**

**3:30 – 5:00 pm Educational Sessions**

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**Pest Management Updates** - Dr. Ayanava Majumdar, Alabama Cooperative Extension System; and Dr. Ed Sikora, Dept. Entomology and Plant Pathology, Auburn University

What season does not bring along issues dealing with insects and diseases? Updates critical to producers for pest management will be discussed during this session.

**5:00 Conclusion**

**GOLD MEDALION SPONSORS:**

Morgan County Farmers Federation

**SILVER MEDALION SPONSORS:**

Chambers County Farmers Federation

Covington County Farmers Federation

Cullman County Farmers Federation

Geneva County Farmers Federation

Jackson County Farmers Federation

Randolph County Farmers Federation

**BRONZE MEDALION SPONSORS:**

Elmore County Farmers Federation

Houston County Farmers Federation

Russell County Farmers Federation

Talladega County Farmers Federation

Walker County Farmers Federation

Washington County Farmers Federation

**EXHIBITORS:**

Agro-Culture Liquid Fertilizer

Alabama Cooperative Extension System

Atlas Manufacturing, Inc.

Auburn University

Collect-N-Go

Conservation Systems Research

Irrigation-Mart

Kelly Seed Co. LLC

Monte Package Co.

Rinker Systems

Siegers Seed

Society of St. Andrew

TRICKL-EEZ

Triple J Nursery

Valent USA

Wiregrass Blueberry Growers Association  
Food Safety Workshop  
September 8, 2011  
6:00 – 9:00 p.m.

Wiregrass Blueberry Packhouse  
2148 Hunter Road  
Columbia, AL 36319

### Agenda

Welcome and Introductions	Clint Smith, President
Introduction to Food Safety on the Farm and in a Packing Facility	Beth Oleson
How to Prepare for a PrimusLabs Audit	Beth Oleson
Introduction to GFSI-Benchmarked Audits	Beth Oleson
Overview of the Food Safety Modernization Act	Beth Oleson
Questions and Answers	



## In This Issue

[House Judiciary Committee Passes Bill to Make E-Verify Mandatory Nationwide](#)

[GFVGA Presents GA Labor Issues at Congressional Hearing](#)

[UGA to Release Economic Impact report on 2011 Spring/Summer Harvest](#)

[The Georgia GAP Food Safety Program Now Offering New Audits](#)

[GlobalG.A.P. Field and Packing Facility Workshop](#)

[GFVGA Staff Met with FDA to Discuss Details about the Food Safety Modernization Act](#)

[Upcoming Events](#)

October 3, 2011

We are excited to send you this inaugural issue of GFVGA's new member communication - the UPDATE. This e-newsletter will be published once a month and distributed to our members and sponsors. It is designed to give you a quick UPDATE on the latest legislative issues and industry news affecting our Georgia fruit and vegetable growers. We would appreciate your feedback, suggestions and comments. Please email to [info@gfvga.org](mailto:info@gfvga.org). GFVGA members can expect to receive the UPDATE around the first of each month. We hope you enjoy the information.

Dick Minor, GFVGA President

## House Judiciary Committee Passes Bill to Make E-Verify Mandatory Nationwide!!



On Wednesday, September 23 The U.S. House of Representatives' Judiciary

Committee passed legislation mandating the use of E-verify for all U.S. employers. The Bill will most likely go to the full House for a vote before the Thanksgiving recess. Due to the issues surrounding this bill, this will be a very heated debate on the provisions to be included in the final Bill.

The Bill is called the Legal Workforce act (H.R. 2885) and was sponsored by Congressman Lamar Smith of Texas, Chairman of the Judiciary Committee. If this legislation is



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Dick Minor, GFVGA President

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[coragen.dupont.com](http://coragen.dupont.com)



**SE REGIONAL**  
Fruit & Vegetable Conference  
January 5–8, 2012



a trade show



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in  
the  
**update?**

for more information  
Contact Molly Allen at  
[mollyallen@bellsouth.net](mailto:mollyallen@bellsouth.net)

passed into law and signed by the President it would over-ride the E-Verify bill Georgia put into effect on July 1 of this year. At this time there is no provision for a guest worker program included or attached to this legislation, which means the E-Verify bill could pass without a fix to our 'guest worker issues'.

For complete article, please [click here](#).

## GFVGA Presents GA Labor Issues at Congressional Hearing



GFVGA Executive Director Charles Hall participated in a congressional staff briefing on E-Verify/ labor issues for both the US House and Senate on September 14. Speaking to over 65 legislative staffers, Hall outlined how passage of H.B. 87 in Georgia effected the 2011 spring and summer harvest. Staffers were interested and questioned how growers overcame the shortage of migrant workers and if crops were not harvested. Hall showed staffers pictures of cucumber, cantaloupe and pepper rotting in the fields where the crop was not able to be picked due to shortage of labor.

Hall was joined by growers from California and Virginia outlining their need for harvest labor and their experiences with the H2A program. The recurring theme in Hall's remarks was, 'do not pass a mandatory E-verify, without a viable and practical guest worker program.'

## UGA To Release Economic Impact Report on 2011 Spring/Summer Harvest in Early October

The economic impact study for Georgia's spring/summer harvest being conducted by the University of Georgia - Center for Agribusiness Development is due for release in



early October. GFVGA commissioned the study to determine the economic impact of the 2011 spring/summer harvest on our farms and rural communities. In addition, the study is analyzing the economic impact on local and state tax revenues from the purchase of goods and services during the harvest season.

According to Charles Hall, GFVGA Executive Director, the crops analyzed will include blueberries, Vidalia onion, bell pepper, cucumbers, blackberries and possibly squash and watermelons. Crop production data was collected from over 200 growers, accounting for approximately 50% or more of the planted acreage for these crops.

For complete article, please [click here](#).

## The Georgia GAP Food Safety Program Now Offering New Audits



The Georgia GAP Food Program (GA GAPP) is now offering NSF Agriculture audits and Global GAP Primary Farm Assurance (Global GAP PFA) audits! Similar to other nationally recognized audits, the NSF Agriculture audits are widely accepted by retail produce buyers and the content does not vary greatly from existing audit checklists offered. Also through NSF Agriculture, GA GAPP auditor Vernon Mullins with Georgia Crop Improvement Association is now certified to audit the Global GAP PFA.

For complete article, please [click here](#).

## GlobalG.A.P. Field and Packing Facility Workshop, Oct. 25-26 in Tifton, GA



The Georgia GAP Food Program (GA GAPP) is sponsoring a GlobalG.A.P. workshop, in conjunction with NSF Agriculture, in Tifton, GA on October 25-26, 2011. The two-day course is designed for individuals seeking a better understanding of GlobalG.A.P. food safety audit requirements for ranch and packing of produce. The course will provide a detailed understanding of the requirements for GlobalG.A.P implementation and

certification.

For more information about the GlobalG.A.P. workshop, [click here](#) for more details. Space is limited.

## GFVGA Meets with FDA to Discuss Food Safety Modernization Act

GFVGA's Beth Oleson met with U.S. Food and Drug Administration's Acting Deputy Director Don Kraemer for the Center for Food Safety and Applied Nutrition (CFSAN) Don Kraemer and other FDA officials to find out what they are thinking when it comes to the Preventive Controls for Produce Safety rule. Together with other members of the United Fresh Food Safety and Regulatory Oversight Committee, Kraemer was asked to discuss the details of the first, and maybe most crucial, rule to affect the produce industry mandated by the Food Safety Modernization Act.

For complete article, please [click here](#).

## Upcoming Events

UAS (Unmanned Autonomous Systems)  
for Precision Agriculture  
October 4, 2011  
Atlanta, GA  
[Click here](#) for more information.

PMA Fresh Summit  
October 14 - 17, 2011  
Atlanta, GA  
[Click here](#) for more information.

Bacterial Fruit Blotch Summit  
October 25 - 26, 2011  
Tifton, Georgia  
[Click here](#) for more information.  
To register on-line, please [click here](#).  
For a printable registration form, please [click here](#).

Global G.A.P. Workshop  
October 25 - 26, 2011  
Tifton, Georgia  
[Click here](#) for more information.

SE Regional Fruit and Vegetable Conference  
January 5 - 8, 2012  
Savannah, Georgia  
[Click here](#) for more information.

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March 1, 2012

## Labor Survey Deadline Extended!!

In case you did not receive a survey that was sent out by Georgia Department of Labor in mid-February the deadline has been extended to March 16th. If you did not receive a survey, please call Kimberly Robinson at the Agriculture Services Unit, 404-232-3500 to get your copy.

IT IS VERY IMPORTANT THAT ALL GROWERS RESPOND TO THE SURVEY!! If you received a copy and did not complete it - please do so before March 16th.

The survey will not ask you about your wage rates. There are questions about how you pay workers, whether by piece rate or by the hour. In addition, there are other questions about your employment practices, including whether prior work experience or drug testing is a requirement for different farm jobs.

For complete article, please [click here](#).

## GFVGA's Beth B. Oleson Tours Fruit and Vegetable Production in Chile

For six intense days, GFVGA's Beth Bland Oleson toured fruit and vegetable production and packing facilities in Chile, South America with the Produce Industry Leadership Program through United Fresh Produce Association, sponsored by DuPont. The week began with an overview of Chilean Agriculture with ASOEX, the Chilean Exporters Association. This overview set the tone for the rest of the week as Oleson and the rest of Leadership Class 17 experienced the global-vision of Chilean producers.

"Producers in Chile are growing for other countries," said Oleson when asked about the main differences between the cultures. "In

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southeastern production, I don't see a great emphasis on growing fruits or vegetables for Asia, Africa, the Middle East, or Europe. These producers grow with the world in mind." Oleson said the most surprising thing

she took away from the trip was that kiwi's grow on vines like table grapes, not on trees.

For complete article, please [click here](#).

georgia  
fruit &  
vegetable  
GROWERS ASSOCIATION

## GFVGA Joins Cantaloupe Food Safety Communication Task Force

The cantaloupe industry met in San Diego, Calif. in January with academic experts, public health and agricultural regulators and food safety professionals to chart a path to enhanced food safety for domestically-produced and imported netted melons. Together, the group identified three areas for collaboration that would result in the highest level of food safety for cantaloupes and agreed to immediately invest time, talent and money in each of those areas. The three outcomes included improving the understanding of risks and controls through basic and targeted research, developing cantaloupe-specific guidance (netted melons), and aggressively extending current melon guidance and new information to the entire industry. While the Center for Produce Safety is swiftly responding to the need for research in its soon-to-be released request for proposals, industry trade associations were charged with the task of meeting the other critical objectives.



For complete article, please [click here](#).

SE REGIONAL  
Fruit & Vegetable Conference

Missed the conference or couldn't be in two rooms at once?

Order your conference DVD recordings today!

## GFVGA Expands Food Safety Consulting Service

In February of 2012, the GFVGA Board of Directors made plans to expand the Georgia Good Agricultural Practices Food Safety Program (GA GAPP). GFVGA members will soon be able to utilize

a more in depth food safety consultation program, complete with customized food safety manuals and HACCP plans.

For over ten years, one of the most utilized membership services of the Georgia Fruit and Vegetable Growers Association has been the GA GAP Food Safety Program. GA GAPP has traditionally educated producers about food safety programs on the farm and in the packing facility, conducted mock-audits, and helped with development of food safety programs and manuals by providing generic SOPs and documentation examples. While these services will continue to be provided, consultants are being hired to expand the services for customized food safety programs as well as to encompass the newly implemented GFSI-benchmarked audits such as GlobalGAP and PrimusGFS.

GFVGA food safety consultants will continue to collaborate with Georgia Crop Improvement Association for GA GAPP and affiliated PrimusLabs food safety audits. GA GAPP is now also working with NSF Agriculture to provide NSF Ag food safety audits as well as GlobalGAP IFA and PFA audits. However, setting up for all other audits will have to go directly through other audit organizations. GA GAPP will work closely with the producer to guide the audit setup process in addition to food safety consultation.

For more information about food safety, GFSI-benchmarked audits, or the new food safety consultation program, contact Beth Bland Oleson at [bbland@asginfo.net](mailto:bbland@asginfo.net) or (706) 845-8200.

## Chefs Named in 2012 Georgia Grown Executive Chef Program

Partnering with Georgia Grown and Georgia Restaurant Association

Georgia  
Agriculture  
Commissioner  
Gary W.  
Black officially  
launched the  
Georgia  
Grown  
Executive  
Chef Program  
during the  
annual Taste  
of Georgia



Legislative Reception held earlier this month in Atlanta.

"We are so excited to partner with the Georgia Restaurant Association and debut this program for our state's culinary community," said Black. "The opportunity to work with these incredible chefs throughout the year will mean great things for Georgia and we look forward to showcasing the availability and

uses for quality, local products throughout the cooking seasons."

For complete article, please [click here](#).

To see photos from the Taste of Georgia Legislative Reception, please [click here](#).

## 2012/2013 Georgia Fruit and Vegetable Foundation Scholarship

The Georgia Fruit and Vegetable Foundation offers a \$2000 scholarship program for students who have a parent that is a GFVGA member or is employed by a GFVGA member. Applications are being accepted. The scholarship has a maximum value to the student of \$2000 (\$500 per year up to four years.) All applications for 2012/2013 scholarships must be postmarked by April 30, 2012.

To qualify:

- The student's mother, father, or legal guardian must be a member of the Georgia Fruit and Vegetable Growers Association or employed by a member of the GFVGA.
- The student must be college committed.
- The student must demonstrate a financial need.
- The student must have a 2.5 GPA (and maintain the 2.5 average or higher to keep the scholarship in subsequent years).

To apply:

- The student must complete the Scholarship Application Form and send it to the GFVGA office. Letters of recommendation and the student's transcript should also be sent the GFVGA office. GFVGA's mailing address is PO Box 2945, LaGrange, Georgia 30241.

For application, please [click here](#).

## Other News

[President's Budget Affects Food and Vegetable Industry](#)

[GFVGA to Host PrimusGFS Standard Training Seminar- Sold Out in 48 Hours!](#)

[Specialty Crop Alliance Asks for Action on Farm Bill](#)

- [Click here](#) to read complete letter.

[Georgia Pest Management Handbook Available from UGA](#)

## Upcoming Events

Southeast Produce Council - Southern Exposure  
March 1 - 3, 2012  
Tampa, Florida  
[Click here](#) for more information.

Primus GFS Standard Training Seminar  
March 6 - 8, 2012  
Tifton, Georgia  
[Click here](#) for more information.

Agriculture Awareness Day  
March 13, 2012

2012 Vidalia Onion Field Day  
April 5, 2012

United Fresh 2012 Convention  
May 1 - 3, 2012  
Dallas, Texas  
[Click here](#) for more information.

SE Regional Fruit and Vegetable Conference  
January 10 - 13, 2013  
Savannah, Georgia

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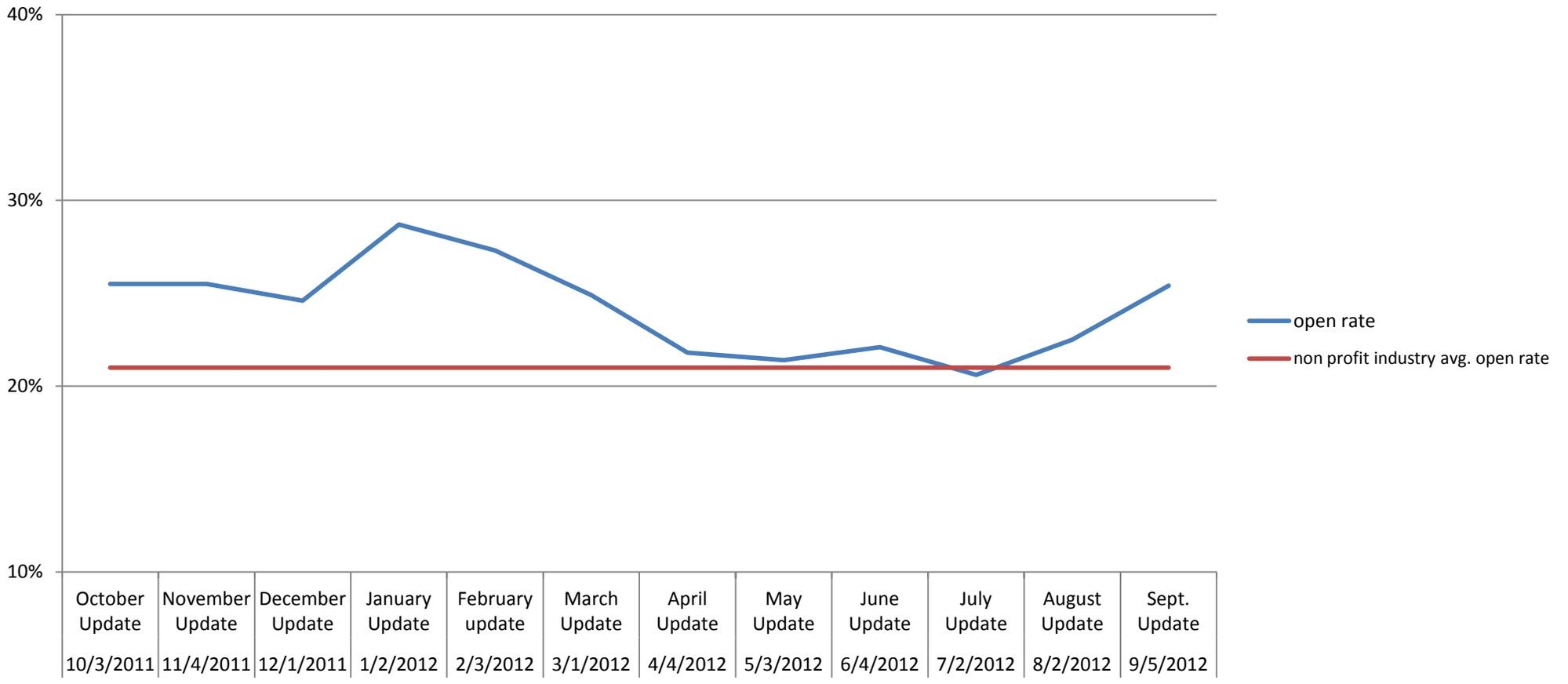


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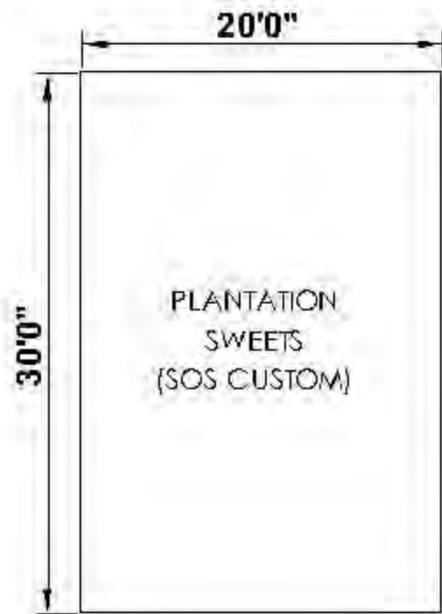
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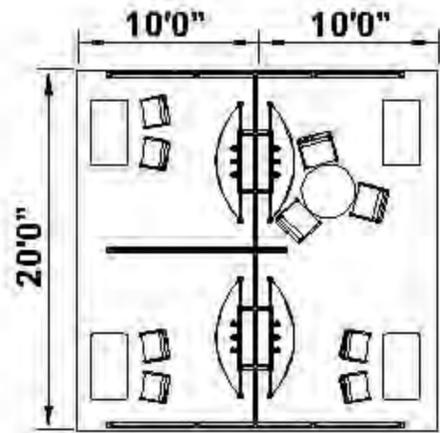
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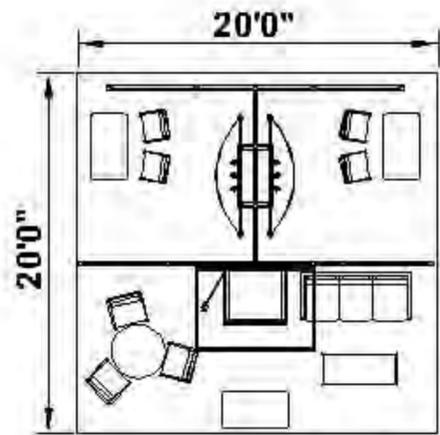
OVERALL PLAN VIEW



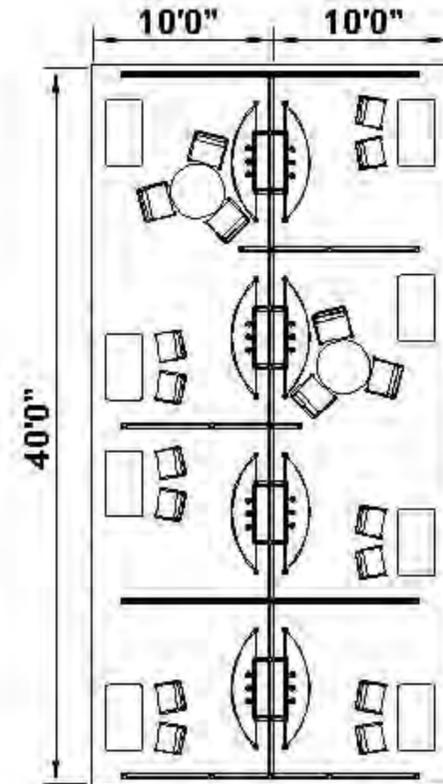
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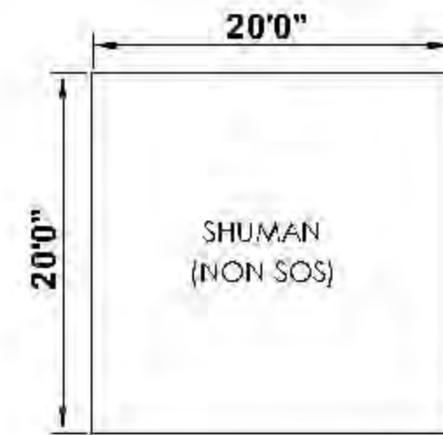
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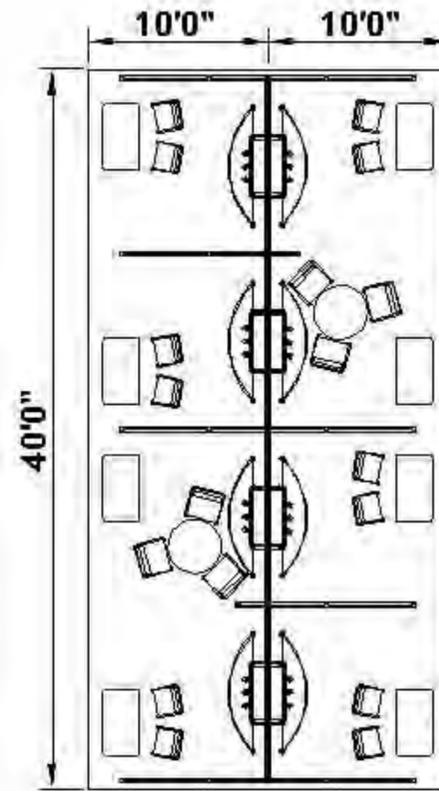
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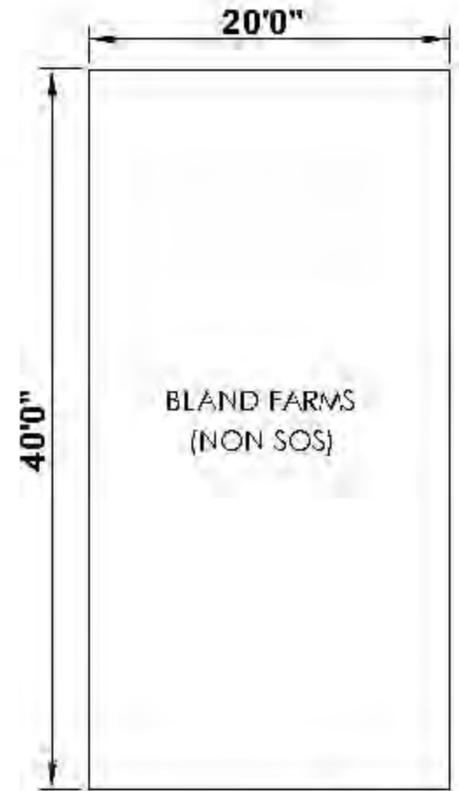
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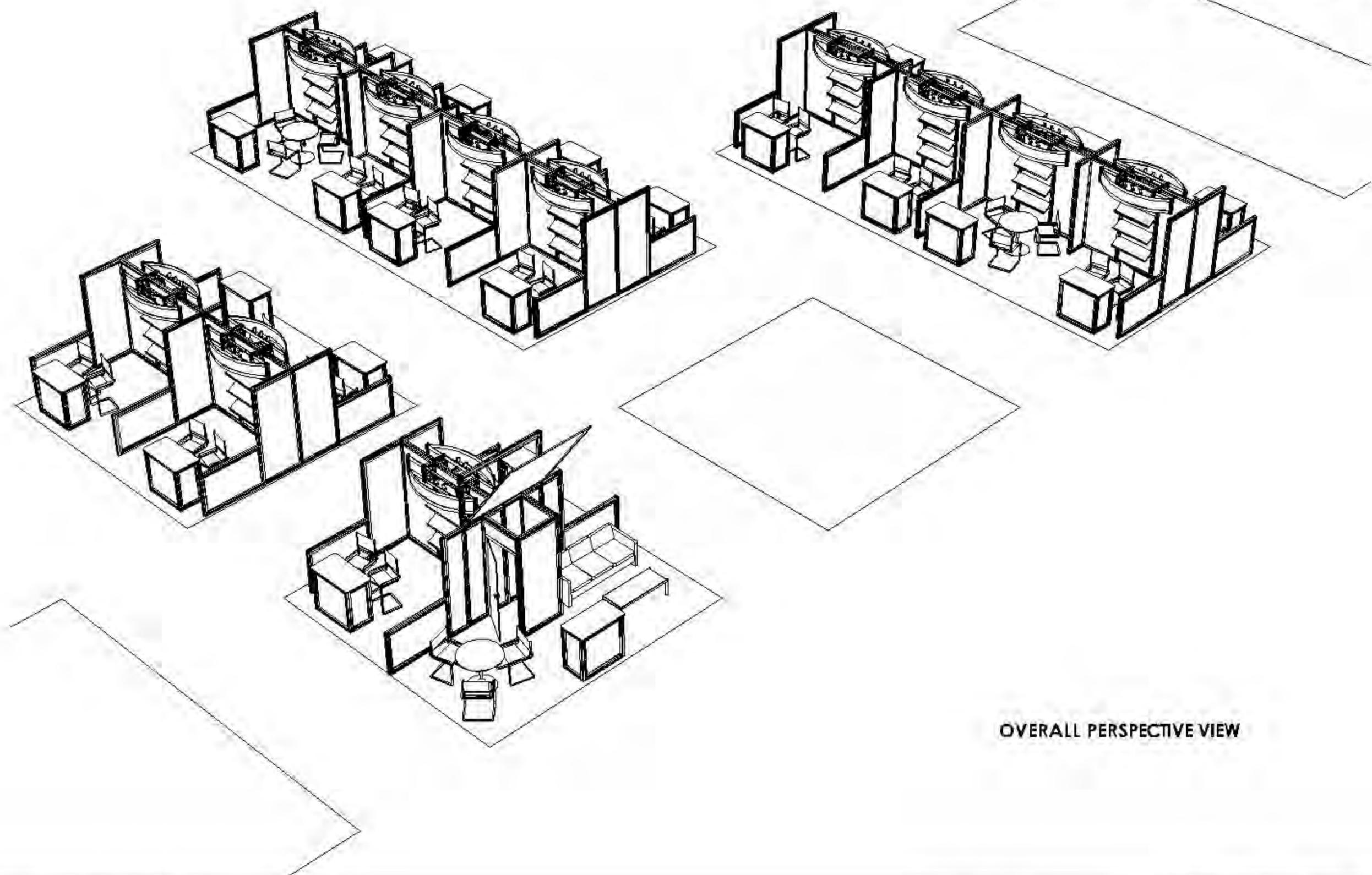


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GEORGIA DEPARTMENT OF AGRICULTURE  
 PMA FRESH SUMMIT 2010  
 AUGUST 17, 2010



OVERALL PERSPECTIVE VIEW

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GEORGIA DEPARTMENT OF AGRICULTURE  
PMA FRESH SUMMIT 2010  
AUGUST 17, 2010

## Georgia Grown Pavilion at PMA

The Georgia Fruit and Vegetable Growers Association, 20 growers and grower organizations participated in the 2010 PMA Fresh Summit in Orlando under the banner of GEORGIA GROWN in a 4200 square foot pavilion. The show opened on Saturday, October 16<sup>th</sup> with attendance from food service and retail buyers. During the three day show, October 16-18, over 15,000 attendees visited Fresh Summit exhibits and educational sessions. Most of the Georgia Grown pavilion participants reported contacts with new customers and strong interest in Georgia products.

New participants in the pavilion in 2010 included:

- Little River Produce
- Plantation Sweets
- Onion Boy
- Cady Bag

Other pavilion participants:

- Jackson Farms
- Classic Vidalia
- Georgia Blueberry Association
- Van Solkema Produce
- G & R Farms
- Harrell's Pecans
- Gerrard's Vidalias
- Leger & Son
- Shuman Produce
- Lane Packing
- ProDew, Inc.
- Pecan Commodity Commission
- Bland Farms
- Paulk Farms
- Vidalia Onion Committee
- Hendrix Produce



According to the Georgia Department of Agriculture additional space has been reserved for the 2011 PMA to be held October 14-17, 2011 in Atlanta. Growers interested in having booth space in the ATLANTA SHOW should contact Greg Peacock at 478-297-8072. All other questions should be directed to the GFVGA office at 1-877-99GFVGA.



Join us in Atlanta for the 2011 PMA!  
October 14 - 17, 2011

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farm tours.**

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The second farm tour focusing on Farm to School initiatives was held at Jaemor Farms in Lula, GA on September 17, 2013. There were 16 in attendance including the Nutrition and Wellness director for GA Department of Education, Director of Food and Nutrition for Forsyth County Schools, the Northeast Georgia Farm to School Consultant and a representative from the Habersham County Public Schools Farm to School Pilot Program. The group was able to tour the 100 year old farm and saw firsthand it's involvement in fruit and vegetable production and agritourism. Jaemor Farms is involved with farm to school and also hosts hundreds of school children yearly on farm field trips. Upon conclusion of the tour, the group discussed how school systems can increase the availability of local produce in schools across Georgia with farmer and owner of Jaemor Farms, Drew Echols, leading the discussion.

