



Macadamia as a Possible Alternative Crop for Florida

KAREN STAUDERMAN*

*University of Florida/IFAS, Volusia County Extension, 3100 E. New York Ave.,
Deland, FL 32724*

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Macadamias are grown in Florida on a small scale, ranking #3 in the United States. Originally from Australia, these rather hardy trees, tolerate temperatures as low as 24 °F. Like farming other tree fruit and nuts, macadamias require at least seven years of investment before the trees begin to produce nuts and 12–15 years before the trees are in full production. This crop is dependent on environmental conditions including well drained soils, mild days, and low chill hours for fruit production and relatively low humidity during spring flower/fruit set and fall harvest.

A macadamia field day was developed at a working Florida grove, and included a walking tour of the farm and processing area. The purpose was to demonstrate best management practices (BMPs) for serious consideration prior to starting a commercial macadamia operation which include site requirements, pest and disease management, environmental data monitoring and propagation methods. Also, exploring marketing options of harvested and processed macadamia nuts to determine feasibility to potential investors. These factors contribute to a healthy environment and smart water usage. An exit survey provided results on which aspects of the program were most useful to the growers, and how field tools presented might conserve water while providing a quality crop.

Background

In spite of recent events from volcanic activity, the big island of Hawaii still leads the United States in macadamia production by 15,000 acres. California acreage is estimated at 3,000 acres and together with Florida, which also grows macadamias on a small scale, makes the United States the world's #2 producer of macadamias, topped by Australia, where the nut originated. Other key producers include South Africa, Guatemala, Costa Rica, and Kenya. These rather hardy trees, tolerate temperatures as low as 24 °F. Macadamias require at least seven years of venture capital output before the trees begin to produce nuts in full production. Macadamia grow best in well drained soils, mild days and low chill hours for fruit production and relatively low humidity during spring flower/fruit set and fall harvest.

Prior to beginning a commercial macadamia operation, BMPs are recommended. These practices include optimizing site requirements, efficient irrigation, proper fertilizer applications, and environmental data monitoring which results in contributing to a healthy environment and smart water usage.

Objectives

The intent of this field day was to explore an active commercial macadamia grove operation. The objective was for 50% of the attendees to gain a better understanding of nut processing. Additionally, the program would delve into its viability in order to ascertain its agricultural feasibility in the state. The program would demonstrate onsite grove BMPs in water and nutrient monitoring and conservation and it would offer propagation methods and address potential obstacles in commercial production. The aim is that 50% of the participants surveyed would experience a perceived knowledge gain in macadamia propagation and 50% would correctly identify ways to keep diseases and pests from establishing in an orchard.

Materials and Methods

A five-hour field day was held on 3 May 2018, at Brackins Macadamia Orchard, East, 838 Florida Route 60, Plant City, FL, in Hillsborough County. The 20-acre grove and facility offered outdoor seating with attendance limited to 75. The program was advertised through University of Florida commercial horticulture listservs, grower meetings, local newspapers, Facebook, and blogs. Thirty-four people attended with a mixed audience of extension agents, investors, growers, specialists, master gardeners and residents of Florida. They traveled throughout the state averaging 59 miles just to attend this field day. During the event, Karen Stauderman of Volusia County Extension, Kevin Athern of Suwanee County Extension, Kelly Morgan, of the University of Florida Southwest Florida Research and Education Center, Eugene McAvoy of Hendry County Extension, Alicia Whidden of Hillsborough County Extension, and Jemy West Hinton of the University of Florida served as topical speakers.

Ken Brackins, owner of Brackins Macadamia Orchard, began the event with a tour of his grove (Fig. 1) and propagation shade house (Fig. 2). He started off explaining the history of the farm, propagation complexities he encountered, pest issues, and past hurricane damage of trees that were recovering in a portion of the grove. He also allowed the attendees to tour his processing area;

*Corresponding author. Email: kstauderman@ufl.edu; phone: 386-822-5578.



Fig. 1. Brackins Macadamia Orchard, Plant City, FL, was the site of the University of Florida Macadamia Field Day event on 3 May 2018.

cracking, shelling, drying and husking of nuts (Fig. 3). Commercial grade implements were activated to show the efficiency of the process. Alicia Whidden introduced the basics of commercial production including Hawaiian methods of commercial production (Fig. 4). She described grafting as a method of propagation that is exclusively used in Hawaii. She concluded by stressing the importance of varietal selection considerations when starting a new commercial macadamia operation in Florida. Karen Stauderman demonstrated the importance of weather monitoring in BMP implementation, and the importance of its accuracy and



Fig. 2. Propagation beds under a shade house structure used for establishing roots on cuttings.



Fig. 3. Alicia Whidden of the University of Florida/IFAS Hillsborough County Extension lectures attendees on macadamia alternative propagation methods and proper variety selections for Florida.

accessibility to our smart devices. She displayed the HOBO Onset data logger (Onset Computer Corp., Bourne, MA) and instructed in the proper placement, mounting and ease of readings in order to encourage behavior change to utilize inexpensive technology to monitor rainfall, temperature, leaf wetness, solar, soil moisture, and rainfall measurements. Lastly, she presented tissue nutrient meters to help with onsite sampling. Kelly Morgan explained the importance of yearly soil and tissue testing. He encouraged the use of new tools that monitor nutrients through cell phone apps,



Fig. 4. Macadamia nut cracker in use.

online weather systems, and state-of-the-art soil moisture sensors to capitalize on the benefits of the BMP efforts and are cost effective, all the while protecting our natural resources. Eugene McAvoy spoke on pests and diseases that put pressure on macadamia groves. He offered preventative measures and scouting tips to maintain awareness. Jemy West Hinton updated all on the latest cost share programs and emphasized the importance of record keeping to maintain BMP compliance. Kevin Athern presented the current U.S. and world-wide marketing efforts of macadamia nuts and suggested new online markets sites for Florida growers to consider. Karen Stauderman provided the attendees with a University of Florida folder containing a resource supply list, PowerPoint presentations, extension documents, and educational notes. They were also given other University of Florida promotional items (note pad, pen, and UV sunglasses).

Many growers, agents and industry personnel were impressed that macadamia were thriving in the Florida climate. Ken Brackins was able to solicit industry help in propagation from a Central Florida nursery (Agri-Starts, Inc., Apopka, FL) that had already begun working on improving seed viability with alternative propagation methods. An exit survey was administered to measure knowledge gain and program effectiveness.

Results and Discussion

Of the 34 attendees, 31 responded to the exit survey. The total distance driven one-way to the event spanned 2–150 miles, with the average attendee traveling 59 miles. When surveyed on technology use, 22% reported using cell phone apps to forecast and monitor the weather, 14% performed annual field nutrient tissue or soil testing, 14% used soil moisture probes and sensors, 10% use on-site field weather stations, and 7% had used a data logger with telemetry. The survey indicated 88% correctly remembered methods that prevented pests and diseases from establishing in Florida macadamia groves. Increased knowledge gains of macadamia propagation proved to be successful. Seventeen of

the participants admitted to gains of 61 to 100%, and 17 at 21 to 60%. Overall, 94% revealed a greater understanding of the nut processing system following the program. When asked if they were considering establishing a macadamia commercial operation or home landscape addition, 9% reported to starting a new operation, 23% would add on to an existing operation, and 68% were looking to plant macadamia in the landscape.

The final assessment of the field day asked the attendees if they would be updating their water saving practices as a direct result of information offered on this field day. Fifty-two percent surveyed were revising their water saving practices and 48% did not see any changes were needed. When asked what helpful information was needed in future field days on macadamias, the answers varied from cost considerations, availability of trees, insect pests and available time in their schedule. Overall, the responses were positive, enthusiastic, and eager for future research and education from University of Florida/IFAS extension.

Impacts

This educational field day succeeded at addressing local impacts including:

- Highlighting farm economics of a commercial macadamia operation
- Potential entrepreneurship in an alternative crop
- Horticultural macadamia grove management and propagation
- Consumer awareness
- Exhibit a food system operation in nut production

Many of the participants thanked the agents for putting on the “well planned” and “highly informative” field day. The Volusia County and Hillsborough County extension agents generated enough interest as a result of the field day that the Executive Director of the Florida Specialty Crop Foundation is seeking a block grant concerning the need for research to work on macadamia as a new crop in Florida to be funded at Gulf Coast Research and Education Center in Balm, FL.