



Introducing Pomegranates to the Dooryard

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Recent freezes and citrus disease outbreaks have resulted in loss of dooryard citrus trees in Volusia County landscapes. Interest has increased among individuals looking for alternative plants to meet the demand of edible fruit trees in the landscape. A UF/IFAS research and extension team responded by providing educational opportunities to Volusia county homeowners, master gardeners and commercial-scale operations on the establishment of pomegranates as an ornamental tree and/or edible fruit in the dooryard. Educational opportunities included news articles, newsletters, seminars, a public broadcast television program, radio interviews and a fact sheet on basic establishment and aesthetic appeal of pomegranates. Four hundred pomegranate trees (30 varieties) were produced at the UF-IFAS Citrus Research and Education Center in Lake Alfred, FL as part of an ongoing project by W. Castle to evaluate pomegranate potential in Florida. The planting locations in either the dooryard or a commercial site of the 400 pomegranate trees sold from the program were recorded on a Volusia County map. All 400 trees were sold with future orders exceeding 125 trees. \$2400 in proceeds from the tree sale provided funds for the extension 4-H youth program. Evaluation data obtained through rising of hands showed that 98% of 85 participants increased their knowledge about the establishment of pomegranate trees. All 400 trees were successfully planted in Volusia County dooryards. Popularity generated from this program sparked the need for further production by two nurseries in the central Florida area to meet the demand.

Recent freezes and citrus disease outbreaks have resulted in the loss of citrus trees in Volusia County dooryards. As a result, homeowners in this central Florida county struggle with options of edible fruit trees suitable for their inland and coastal landscapes. Volusia County is known for its subtropical environment which includes warm wet summers, cool dry winters and coastal sea breezes. This climate would not seem compatible with the semi-arid climate in the regions where pomegranates are native. Pomegranates apparently can be grown in many locations throughout the U.S. including locations as far north as Washington, DC. However, they fail to produce fruit farther north than eastern North Carolina (Hodgson, 1917) and are injured by temperatures lower than -11°C (12.2°F) (Morton, 1987). California is the state with the largest commercial production of pomegranates with upwards of 30,000 acres and production continues to increase yearly (California Pomegranate Council, 2009).

EARLY BEGINNINGS. Pomegranates, *Punica granatum* L., are native to Persia and Asia and were grown in ancient Egypt, Babylon, India, and Iran (Mars, 2000; Morton, 1987). Spain is the largest western producer of pomegranates and continues to dominate as a result of high market prices (Costa and Melgarejo, 2000). The evidence suggests that the pomegranate was introduced to the United States in the early 1700s, when they were grown in Spanish Florida and English Georgia. By the year 1770, the pomegranate was established in the missions of California (Morton, 1987; Seelig, 1970). The most popular pomegranate cultivar today in the U.S. is 'Wonderful.' After the pomegranate was introduced to Spanish Florida, seedlings were later sent to California in the 1800s. Among those was a plant later selected and named 'Wonderful.' California dominates production with the cultivar 'Wonderful', but as the interest in expanding the market season

grows, growers are exploring earlier and later cultivars (Kotkin, 2006). 'Wonderful' is still popular and is found in many nurseries throughout Georgia and Florida today. However, the diversity in cultivars is striking and most selections are unknown to the public. There are many ornamental cultivars with spectacular large blooms perfect for the homeowner landscape. Photos and other details about cultivars, cultural management and information and data from the University of Florida/IFAS foundation blocks are available at our comprehensive website (Castle, 2009): www.crec.ifas.ufl.edu/extension/pomegranates/.

POMEGRANATES IN THE LANDSCAPE. Pomegranates can be used in the landscape as an edible fruit plant and as an ornamental tree or shrub. They have aesthetic beauty with important traits including fruit size, peel color (varying from yellow to purple, with pink and red most common), aril color (various shades from white to red), hardness of the seed, flavor and funnel shaped flowers of differing colors (white, yellow, orange or red). The plants are often trained to a single trunk reaching 12–20 ft in height. They can also be trained with multiple trunks giving the appearance of large shrubs. The plant is deciduous with spiny stems and small narrow leaves (Morton, 1987) and is monoecious, meaning that it produces two kinds of flowers (male and perfect) on the same plant. The flowers can occur singly or in clusters of up to five. Pomegranate pollination occurs through insects, or hummingbirds, which make it an ideal wildlife-friendly plant. The plants are ideal as drought-tolerant specimens which are sought after an added benefit in today's water-saving landscapes. They are especially adapted to highly saline soils (Melgarejo, 2003) and are easy to propagate by seed, cutting, air-layer, and root-sucker transplantation (Morton, 1987).

ADDITIONAL BENEFITS. The pomegranate fruit has an added benefit, i.e., the juice is very healthy because of antioxidants, vitamins and minerals including thiamin, riboflavin, niacin,

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vitamins B6, B9, and C, calcium, iron, magnesium, phosphorus, potassium, and zinc (Gil et. al 2000).

DRAWBACKS. Pomegranates are relatively free of most pests and diseases. Minor problems are leaf and fruit spot and foliar damage by white flies, thrips, mealybugs, and scale insects as reported in California, but many of these problems have not been experienced to date in Florida (California Rare Fruit Growers, 1997). There are few recorded pests of the pomegranate (Carroll, 2010); however, some pests that impact commercial production in California include: *Brevipalpus lewisi* (flat mite), *Virachola* sp. (moth), and *Platynola stultana* (leafroller). They cause fruit russetting and blemishes that deem the fruit to be unmarketable, but again, those pests have generally not been problematic in Florida. The major issues in Florida are fungal diseases that affect the trees and fruit. *Alternaria* heart rot (LaRue, 1980) has been recorded to affect California fruit, *Cercospora punicae* (Alfieri, 1978), *Pilidiella granati* (Palou et al., 2010), *Botrytis cinerea*, a postharvest decay of fruit (Adaskaveg and Michailides, 2012) and a foliar fungus pomegranate stem canker caused by *Botryosphaeria dothidea* attacks the blossom-end of the fruit and results in pomegranate fruit decay (Liu et al., 2008). The latter is especially prevalent during late warm, humid summer conditions common to central Florida (Proffer, 1989; Scherm, 2011).

INTRODUCTION TO VOLUSIA COUNTY. In Volusia County, the popularity of native plants has increased the demand for plants that are perceived as “well adapted” to the Florida landscape. Pomegranate plants date to antiquity and they were successfully introduced by our Florida ancestors well over 150 years ago. In 2009, Dr. Bill Castle at the University of Florida, IFAS, Citrus Research and Extension Center (CREC), initiated a pomegranate project. His collection now includes over 100 accessions obtained from California, Georgia, and Florida homeowners and local nurseries. Nearly 7,000 plants have propagated and distributed to cooperators. In 2011, the authors, representing UF/CREC and UF-IFAS Volusia County Horticulture Extension formed a team to respond to the needs of the Volusia County residents. They provided educational opportunities to Volusia County homeowners, master gardeners, and commercial-scale operations on the establishment of pomegranates as an ornamental tree and/or marketable fruit production. Additionally, seminars were presented to highlight the health benefits and potential markets for the edible fruit. Educational opportunities included a news article in the *Daytona Beach News Journal*, *The Backyard Gardener* newsletter, two seminars, a radio interview, a fact sheet, and the public broadcasted television program *Gardener’s Hotline* (PBS CH-15) (which has had 61 online views as of May 2012). These efforts were aimed at stimulating interest and aesthetic appeal of pomegranate trees.

Results

Beginning in 2009, Dr. Castle developed and maintains a comprehensive website for information about pomegranate trees in Florida (Castle, 2009). The website is a source of information about U.S. cultivars including descriptions, images, and yield and other information collected from the Foundation (mother) blocks at Water Conserv II and the CREC in Lake Alfred, FL. Pomegranate trees propagated and produced at the UF-IFAS Citrus Research and Education Center in Lake Alfred were made available for the Volusia County project, which involved 400 plants of 30 varieties to be sold within Volusia County. Homeowners that purchased the trees were surveyed (via email) on planting time,

plant location within the county, and whether further information on culturing pomegranates and follow-up communication desired. Three months after the start of the program, all 400 trees were sold (\$10 each) with future orders exceeding 125 trees. The proceeds generated from the tree sale (\$2400) provided funds for the extension 4-H youth program. Participants in the educational seminars provided evaluation data through an opinion survey in which 98% (n=85) reported an increased knowledge about the establishment of pomegranate trees. An email survey yielded responses from 25 homeowners (n=80). This equated to a 31.5% response rate, which accounted for 84 of the 400 trees (Fig. 1, Volusia County Map). All individuals in the survey indicated that the trees were planted or actively maintained for a spring planting.

Discussion

The popularity of the program continues to spark interest within Volusia County and throughout central Florida. As a result of an educational pomegranate program offered in nearby Brevard County, master gardeners from Brevard County began obtaining pomegranate plant material for future fundraising efforts. Successful marketing of the trees increased the need for further commercial production of pomegranate trees. Two nurseries in the central Florida area have expanded their propagation practices to meet the demand. Volusia County appears to be an ideal location for pomegranates. The diversity of soil types ranging from saline conditions near the ocean communities to the acidic conditions inland will determine if this plant is highly adaptable. The climate conditions also make it a wise choice when the average winter temperature is $\approx 16.5^{\circ}\text{C}$ (61.5°F) with an average annual extreme minimum temperature ranging between -2.9°C to -1.1°C (≈ 26 to 33.8°F) (USDA, 2012). Meanwhile, observation will continue to learn which of the varieties is best suited to this area.



Fig.1. Locations of pomegranates distributed to homeowners in Volusia County, FL.

Conclusion

There is a strong interest in pomegranates in Volusia County. The plant specimens appear to be suited to the coastal climate of the county with successful plantings beachside and inland. The beauty of the plants and the added health benefits from the juice of the fruit make it a consumer choice for the landscape as an edible fruit. As part of the effort in Volusia County, collaboration is under way with the newly formed Florida Pomegranate Association, a state-wide professional organization providing a forum for sharing information and experience among members, to support research and to assist in evaluation and development of cultivars and best management practices suited for Florida. It will be interesting to see if the popularity of the tree and fruit in Florida will meet or exceed the demand generated elsewhere in the nation.

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