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Backyard Gardener

VOLUSIA COUNTY EXTENSION

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Pomegranates in Florida?

Yes!

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Pomegranate
(*P u n i c a*
granatum L.)
may have poten-
tial as an alterna-
tive crop for cit-
rus in Florida
and also as a
crop for small
farmers. If you

are not familiar with the plant and fruit, that's ok. It is sufficient to know that both the plant and the fruit are beautiful and the juice is very healthy. Pomegranate is also very well suited to an edible landscape.

First reason: The health benefits associated with pomegranate fruit and juice are well known. Dark- colored berry fruit like pomegranate generally are loaded with anti-oxidants and other components that aid your health (see Antioxidant Activity of Pomegranate Juice and Its Relationship with Phenolic Composition and Process-

ing, University of California, J. Agric. Food Chem., 2000, 48 (10), pp 4581–4589). The pomegranate has been described as "the most medicinal fruit in the world" partly because it is rich in thiamin, riboflavin, niacin, vitamins B6, B9, and C, calcium, iron, magnesium, phosphorus, potassium and zinc.

Second reason: They are fun to grow and eat!

Third reason: The range of cultivars and their traits is eye-opening. The fruit has been cultivated for centuries and is well established as a species of considerable ethnic importance. There are selections used commercially for their fruit and juice, other selections that are dwarf and others used as ornamentals. Fruit size and color range from yellow to pink to bright red with the portion that you eat (the aril) also varying in color from white to pink to dark red. Seed texture can be hard (essentially inedible) to medium to soft. Those selections with soft seeds allow a consumer to open the fruit and scoop out the contents and eat everything without having to separate the pulp from the seeds.

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Pomegranate Botany

The pomegranate is a naturally bushy, multi-stemmed plant that tends to maintain its bushiness because of suckers routinely arising from the base. Plants grow to heights of ca. 10-12 feet and commercially are often trained to a single trunk or sometimes three stems.

The plant is normally deciduous. New spring shoots tend to be thin and weepy with thorns. The leaves are shiny and dark green. The plant is essentially monoecious (Male and hermaphroditic flowers both produced on the same plant) with both types of showy flowers produced on new growth each spring. Flowering may occur over several months with some flowers still being produced into late summer/early fall, but the major bloom period is the spring.

A flower is either male or hermaphroditic. The latter flower type is bell-shaped and self-fertile. Hermaphroditic flowers produce fruit. Male flowers are more trumpet-shaped and do not set fruit. Flower color for many cultivars is orange-red to brilliant red and there are some, especially ornamental types, with "double" flowers (i.e., with extra petals) or some that are pink, white, or some combination of those colors and red. Pollination primarily by insects (bees) leads to fruit set and the development of the inferior ovary.

The mature pomegranate fruit is large, usually 3 inches in diameter, and sometimes as large as 4 to 5 inches. Fruit generally mature in 5 to 8 months and often change from round to a slightly squared-out shape. The fruit of different cultivars are quite diverse in their color, taste, and certain other traits. Peel color ranges from a light yellow to "black" or very dark red/purple. The fruit is distinctive because it retains the calyx (petals + sepals) at one end of the fruit giving the fruit the appearance at maturity of having a small crown attached to it. Internally, the fruit consists of a series of chambers (locules) separated by a

membranous septum. Inside each chamber are the seeds which each have a fleshy outgrowth (aril) that contains the edible juice. The seeds range in hardness from very hard (not edible) to soft (easily consumed). The color of the arils also ranges from a light, virtually white, color to very dark red or purple. The flavor of the juice can be inedibly tart to bland to sweet or sweet/tart depending on acidity.

Pomegranate Culture

The pomegranate plant is adaptive to a wide range of environmental and soil conditions, but is usually described as requiring a long, hot, dry season to crop properly. There are mixed reviews about its tolerance to salinity and calcareous soils indicating the need for further investigation. The plant is very cold hardy, but is not tolerant of wet conditions. It is responsive to irrigation as a recommended practice, perhaps with water not containing more than 2,000 ppm salt. However, plants in Israel have been irrigated with 4,000 to 6,000 ppm saline water with effects on vegetative growth but without significant injury to the plant.



Fertilization. There are few reports on formal fertilization studies, but supplying the usual essential elements apparently improves commercial performance. In Israel, Spain, India, and other regions, pomegranates are fertigated while in other places the plants are supplied with dry fertilizers. Some attempts have been made to establish leaf nutrient standards through research and some data have been developed privately, e.g., in California. Some evidence suggests that careful attention to certain nutrients can affect aril weight and fruit size without altering juice quality.

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The terms "seed" and "aril" are often used interchangeably as if they defined the same thing which is not true. Technically speaking, the "seed" has two parts: the crunchy interior structure that is the part that contains the embryo and is sometimes eaten if it is not perceived to be too hard, and the juicy part or the aril. The aril is a fleshy outgrowth of the seed coat and provides the color of the

Propagation, orchard design, tree training.

Pomegranates are readily propagated from stem cuttings of various size and age. They root easily with application of commercial hormone products and placement in a mist bed. They can also root when placed directly into orchard soil. Pomegranates can be propagated from seed. They have a relatively short juvenile period and can begin flowering in one year, but more typically after 2 or 3 years.

Good light interception is considered essential for cropping and fruit development. Thus, plants are usually widely spaced, ca. 10-12 x 20 ft. and trained to a form that minimizes the willowy young branches that bend under the weight of fruit. The plants are often trained to one to three trunks with an open vase canopy. In some instances, a single trunk is formed and three main branches diverge 1 or 2 ft from the ground to form the open vase.

Pests and diseases. Reviews of pomegranate culture have long lists of pests and diseases that include various insects, fungi, and bacteria. Among the insects, aphids appear to be common to most regions where pomegranates are grown especially among young plants at the propagation stage. Other insect pests are some of those common to citrus in Florida like mealy

bugs, thrips, and various mites, but pomegranates are not listed as a significant host for **Med fly** (Thomas et al., 2010). Less information appears to be known about the **Caribfly** which has been found in much of peninsula Florida infesting guava and other soft fruits and occasionally citrus. In one study conducted only in the Miami area without any observation on seasonality of infestation, pomegranate was listed as a host of this pest (see Swanson and Baranowski and the DPI publication). Root knot nematode, *Meloidogyne incognita*, has been reported to be a serious pest.

The more serious problems are diseases caused by fungi and bacteria. Among these are leaf spotting that can lead to leaf drop, caused by *Cercospora punicea*

fruit blemishes also caused by *Cercospora sp.* and fruit decay that renders fruit inedible. The bacterial genera *Botryosphaeria* and *Alternaria* along with others are implicated as sources of fruit rot problems.

Pomegranates as an Alternative Commercial Enterprise in Central Florida

The pomegranate has a certain natural appeal because it is such an unusual fruit, one that is quite different from the common fruits such as bananas and apples consumed in the U.S. Part of its appeal may relate to its long history of cultivation. The pomegranate is an edible fruit of antiquity that ranks right along with the date, fig, and olive. Also, there is considerable current consumer interest in pomegranate because of its reputation as a healthy fruit and juice.

The major producers of pomegranate are India, Iran, Turkey, and Spain, and in the U.S, California is the major grower. The reputation of pomegranate has benefitted considerably from the aggressive marketing effort of a California company and their product, POM Wonderful® which is derived from the 'Wonderful' cultivar. Their efforts have greatly raised the awareness of pomegranate.



The pomegranate is native to regions of the Middle East (Persia, e.g., Iran), and Southeast Asia (e.g., Turkmenistan and Afghanistan), areas with relatively cold winters and arid, but hot summers. The species is not generally considered to be suitable for climates such those of the southeastern U.S. where the winters can be cold, but the weather is humid during the warmer months of the year. Nevertheless, pomegranates have been a dooryard plant in South Georgia and Florida for decades. Determining the commercial potential of pomegranate in Florida is only now being investigated.

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1. Collect pomegranate selections and cultivars and establish mother blocks.
2. Propagate from the collection and provide plants to interested grower.
3. Establish cooperative projects and evaluate the selections.

We chose these objectives because, while it is already apparent that pomegranate plants will grow in at least central Florida and northward into southern Georgia, it is not known whether the plants will produce acceptable quantities of good quality fruit especially for commercial purposes. We see these options:

1. Fresh fruit grown conventionally or organically. Particularly intriguing would be to grow the fruit as a small farm enterprise and market it locally.
2. Fruit grown by either method for juice which might alter the cultural program towards less use of pesticides. Particularly appealing with this option is to grow fruit for juicing in a small retail outlet and possibly blending with other juices such as blueberry

or peach. Equipment for countertop operations to produce single glasses of juice or small quantities for bottling is readily available via the internet.

3. Pomegranates grown as an ornamental for the homeowner and the Edible Landscape.

4. Produce fruit for extracting and marketing of the arils. A brief search of the internet will reveal the variety of commercial equipment available for juicing the fruit and extracting and packaging arils.

So, why not give them a try? Start with a couple of plants of different varie-

ties and see how they do. As they progress, evaluate how they do and then, try some more. At the UF/IFAS Extension in Volusia County, we will continue to offer named varieties pomegranates, for sale, at various times throughout the year. We will also be planting some in our soon-to-be-renovated demonstration landscape so we can show that pomegranates can be a fun, attractive and viable alternative for the home landscape, the edible landscape and as a small commercial alternative in central Florida.



Can You Name This?

Answers on page 7



Photos by Ed Williams

CHRISTMAS CACTUS OR EASTER CACTUS?

These two cacti (succulents, *Schlumbergera*) belong to the same family of Forest Cacti. They are native to the Americas and in their natural home are attached to trees in woodlands and jungles. Their colors are white, pink, red or purple. We tell them apart because of the time of year they bloom but there are other distinctions in appearance, the Christmas Cactus has foliage of long, flat, jointed tooth edged leaves and the Easter Cactus has long, flat, scalloped leaf margins with tiny hairs at the joints.



Photo by Ed Williams

The flowering of each variety is set by the resting, growing and flowering seasons. This gives us a clue to their blooming times for which they were named. The Forest Cacti can be shy bloomers and if you want good blooming there are rules to follow.

After blooming, Christmas Cacti (mid November through January) will begin their resting period (February and March). Keep them cool and water infrequently to keep them from shriveling. A spell outdoors during this resting period will help produce next year's buds. In April and May treat them normally when they begin to dry out. In June, July and August they begin their growing period. In October to mid November is the pre flowering and bud forming time. At this time keep them dryish and cool until the buds start to form and then increase water and temperature. At blooming -minimum temperature of 55 degrees thru December.

Easter Cacti - After flowering in April and May, put the plant outdoors from June till September. Water normally; protect from slugs. At this time it can be

repotted (once every 2 years with loose soil). After this growing period it will begin its resting period (October, November, December and early January). Before first frost it must be moved to cool winter quarters while it is resting. During this time keep it moist but do not over water. February and March begin its pre--flowering period; keep it cool and dryish and then begin to increase water and temperature. Buds should begin to form. Water normally and keep it at 60 degrees minimum and follow directions to prevent bud drop.



Photo by Ed Williams

Feed Cacti with N fertilizer regularly. Boost P 6 months prior to flowering. Cease feeding 3 months before blooming. Never move a plant once buds begin to appear and let stems harden outdoors during the summer. They should not dry out during their growing season, but the rest of the year keep them as dry as possible (Not shriveled this is damaging).

Causes of Bud Dropping:

- Too little summer nourishment.
- Plants turned in relation to the angle of light during bud formation (don't turn)
- Too much difference between day and night temperature when buds are forming
- Compost (soil) has dried out during growing season
- Water too cold

Marty Borkosky



Some Pollination Basics

How about some basics about something we all discuss?

1. Pollination... the transfer of pollen from the male plant parts (anther) to the female plant parts (stigma)
2. Pollenizer... a plant that provides pollen
3. Pollinator... biologic that mechanically transports pollen from anthers to stigmas
4. Fertilization... sperm from the pollen combining with the plants eggs...

A pollinator pollinates accidentally. Honey bees don't get up in the morning, hold a meeting and decide to help plants have babies. Honey bees have a small electric charge as does plant pollen but opposite in charge. The static charge attracts the pollen to the bee. Their plumose hairs then hold onto the pollen until it rubs off on something which, hopefully, is a plant's stigma that needs the pollen. So, what the heck is a plumose hair? Honey bee hair ends are split (don't panic ladies). The split ends trap and hold the pollen. Pretty good design.

If the honey bee is on a pollen gathering mission it will put some plant nectar on its front leg and wipe the



hairs on its body. The pollen sticks to the nectar. The bee then rubs the foreleg on its hind leg where the pollen basket (corbicula) resides. The pollen collects in the corbiculae and forms pollen balls which are very visible on a bee's hind legs.

The bee collects an amount of pollen almost equal to its body weight and flies back to the hive (up to 3 miles in normal conditions and up to 6 miles in times of dearth). The pollen ball is put in a cell in the comb with other pollen balls. Nurse bees in the hive push the pollen with their heads to compress it in the cell... funny to watch.

Why go to all this trouble? The bee larvae need to be

fed bee bread (pollen mixed with honey) in order to develop properly and eventually pupate. Young bees also need pollen to properly complete their development. Pollen is the bees' protein, lipid (fats), mineral and vitamin source. Honey is their carbohydrate source. Adult bees can live on honey alone for extended periods but not larvae or young bees.

When a bee forages it only forages for one thing at a time. Each bee is looking for pollen, nectar, water or sap (for propolis). A single bee does not collect a bit of everything.



Some how the colony is able to instruct bees what to collect (topic for another column perhaps). The presence of a lot of brood (larvae) is one driving force for the colony to increase the collection of pollen. The larvae have a pheromone (scent) that adult bees recognize as being from the brood. The more intense the scent the more pollen will be collected. Isn't Mother Nature clever?

Different insect pollinators have different ways of collecting pollen. Some have hairs under their abdomen and others with a lot of hairs only on the legs. All have evolved to work in harmony with the



Russ Ottens, University of Georgia, Bugwood.org

plants. All pollinators cannot/do not pollinate all plants. That is why having native pollinators in addition to honey bees is so important. Native pollinators have evolved with native plants. They are 'engineered' to work together. It is important to always keep in mind that everything in nature is somehow related to everything else. It is an awe inspiring world we live on.

Note to spelling bee (pun intended) contestants: honey bee is correctly spelled as two words not one.

Ed Williams

Can You Name This? Answer



Rudbeckia hirta



Nest of Grass Carrying Wasp—*Isodontia* spp.

November & December Calendar of Public Events

Event	Date	Location
Caring for Holiday plants (2 CEUs)	11/6	Daytona Beach Library
Honey Bee Biology and Behavior (1.5 CEUs)	11/7	Debary Hall Historic Site
Tomoka Fall Festival	11/9	Tomoka State Park
Upgrading your landscape(1 CEU)	11/14	Debary Hall Historic Site
Sugar Mill Garden Q&A and plant swap	11/20	Sugar Mill Gardens
Preparing your garden for Winter (1 CEU)	11/21	Ormond Beach Regional Library
Low-volume Irrigation for the Home Landscape - Cost: \$5 (2 CEUs)	11/23	TBD
History of gardening(1 CEU)	12/5	Debary Hall Historic Site
Introduction to Beekeeping for the General Public (1.5 CEUs)	12/12	Debary Hall Historic Site
Dormant Season Pruning Workshop - Cost: \$5 (2 CEUs)	12/14	Volusia County Ag Center Auditorium
Sugar Mill Garden and plant swap	12/18	Sugar Mill Gardens
Where plants come from(1 CEU)	12/19	Debary Hall Historic Site

**For more details Master Gardeners should check the VMS calendar.
The general public may contact the Volusia County Agricultural Center.**

**Volusia County Agricultural Center
3100E. New York Ave. (S.R. 44),
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At the Volusia County Fair Grounds**

West Volusia... 386-822-5778 Daytona Beach... 386-257-6012 New Smyrna Beach... 386-423-3368