

## Pomegranate, Fruit of the Desert

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### Origin and Adaptation

The region of the world from Iran to northern India is known as the origin of the pomegranate. Pomegranates were also cultivated in Greece as Greek writers made reference to them several hundred years B.C. before the almond, peach, or apricot. It is thought that Spanish missionaries first brought pomegranates to the New World around 1521, with early settlers introducing them to California in 1769 (Morton, 1987).

Its present scientific name *Punica granatum* is derived from “pomuni granatum” (meaning seeded apple). Pomegranates prefer a semi-arid to sub-tropical climate (hot summers and mild winters). Pomegranates are suited to USDA Zones 8-11. Plants will harden off when exposed to cold gradually, but will generally suffer damage below 12 degrees F. They are successfully grown in dry areas (low rainfall and low humidity) of the southwestern United States such as the deserts of California, Nevada, Utah, Arizona and New Mexico.

### Description

Pomegranates grow naturally as a bushy shrub, but may be trained as a small tree growing 12 to 15 feet high (LaRue, 1980). Although vigor declines after 15 years or so, suckers readily grow from the base, and plants have been known to survive for more

than 200 years. Branches are stiff and spiny with glossy, lance shaped leaves. Flowers may be scarlet, white or variegated with 5 to 8 crumpled petals and a red, fleshy, tubular calyx. Pomegranates are self-pollinating, but bees and other insects such as beetles do visit the flowers and likely play a role in pollen transfer.

### Cultivation

Pomegranates prefer full sun and although they will grow in part-shade the sun is needed to produce sugars and reach full flavor. Plants thrive in well drained loamy soil, but don't require a specific soil type and do quite well in alkaline conditions.



Annual applications of nitrogen are suggested to help maintain vigor. Young plants will benefit from 6 to 8 ounces of ammonium sulfate per tree, annually, for the first 3 to 4 years. After that, 3 to 4 ounces is usually sufficient to maintain new growth each year. Pomegranates do not seem to benefit from the addition of phosphorus or potassium. If zinc or iron deficiency symptoms appear it is best to apply chelated forms of each as needed. (LaRue, 1980)

Once established, the plants are very tolerant of drought. To produce quality fruit however, regular irrigation is required. A deep thorough watering every 7 to 10 days is suggested. Like most fruits, pomegranates may be raised from seeds but will not be "true to type." Vegetative propagation is easily done by using one year old cuttings about 10 to 12 inches long and ¼ to ½ inch in diameter taken in late winter. Remove leaves and treat cut area with rooting hormone. Place bottom third of stem in warm rooting media. Or, in early spring, cuttings may be placed outside if soil has begun to warm. Plants are usually not disturbed for a full season while rooting takes place. The following spring, plants may be moved to pots for sale or directly to the field for orchard culture. A suggested spacing for home growing is 10 to 12 feet between plants with 14 to 16 feet between rows. Commercial plantings should be on the order of 12 to 14 feet in the row with 18 to 20 feet between rows. This allows an appropriate amount of room for harvesting, as well as, moving trucks, etc., in and out of orchard rows to remove harvested fruit. Home growers often keep pomegranates short and bushy. Commercial orchards generally train pomegranates into trees. The latter generally produces less pomegranates but larger, higher quality fruit.

## Pruning and Fruiting Habit

For bush culture, prune tips of shoots the first 2 to 3 years to encourage more new shoots to form. Leave tips unpruned from then on to promote fruiting. Fruits are generally borne on the tips of branches out in full sun. Short spurs on 2 to 3 year old wood are the most productive. After 5 years or so, the wood may lose its fruiting habit. At that point, remove oldest shoots all the way to the ground (thinning cut). For tree culture, prune young plants at 24-30 inches. As more shoots come, remove

lower branches to encourage a single main stem. From there, allow main branches to develop like a central leader fruit tree. Light annual pruning is recommended to renew fruit wood. Severe pruning will reduce yields.

Fruits are 2 ½ to 5 inches wide and have a prominent calyx which persists even after harvest. The leathery skin turns from green to pink as it ripens and becomes deep red on some varieties. Harvest before overripe (even a little early) to avoid splitting. Rain will contribute to splitting especially when rain occurs near ripening. Fruits may store for 6-7 months. Highest quality will be realized if fruits are stored between 32 and 41 degrees F. Shrinking and spoilage are reduced if humidity can be maintained around 80%. Flavor often improves in storage if conditions are right.

Pomegranates are one of the highest rated fruits in terms of antioxidants (Adhami, Khan, Mukhtar, 2009). These are the chemicals which occur naturally in a number of fruits and vegetables that are thought to prevent or reduce the incidence of cancer. Recent research indicates that pomegranate extract may selectively inhibit the growth of cancer cells in the, prostate, colon, breasts, and lungs. Research will, no doubt, continue to investigate the possible reduction of cancer cells due to antioxidants found in pomegranates, as well as other dark skinned fruits including grapes, blueberries, blackberries and raspberries.

## Pests

Few diseases have been found on pomegranates; however when they are, it is generally associated with cracked fruits. Insects such as whiteflies, thrips, mealybugs and scale have been identified but none are considered serious. The Leaf-footed plant bug has been found in home grown fruit in Nevada (Crites, Robison, Mills, 2004) and Utah. These do not seem to penetrate the rind but are associated with cracked, overripe fruit. Commercial growing areas of California have reported a half dozen or so pests but only a couple that may require treatment. Fruit cracking is often reported in home culture. The best way to prevent cracking is to provide regular irrigation. Pomegranates will take up water rapidly when available, especially after periods of drought. The rapid uptake will frequently split the rind exposing the soft seeds (arils). This makes

them vulnerable to fungal spores and insects looking to feed on the juices and lay eggs inside the fruit. Late summer and early fall rains will encourage cracking. It may become severe the closer rains occur to harvest.

## **CULTIVARS**

(California Rare Fruit Growers, 1997)

### **Balegal**

Originated in San Diego, CA. Selected by Paul H. Thomson. Large, roundish fruit, 3 inches in diameter. Somewhat larger than Fleshman. Skin pale pink, lighter than Fleshman. Flesh slightly darker than Fleshman, very sweet.

### **Cloud**

From the University of California, Davis, pomegranate collection. Medium-sized fruit with a green-red color. Juice sweet and white.

### **Crab**

From the University of California, Davis, pomegranate collection. Large fruit have red juice that is tart but with a rich flavor. A heavy bearing tree.

### **Early Wonderful**

Large, deep-red, thin-skinned, delicious fruit. Ripens about 2 weeks ahead of Wonderful. Medium-sized bush with large, orange-red fertile flowers. Blooms late, very productive.

### **Fleshman**

Originated in Fallbrook, CA. Selected by Paul H. Thomson. Large, roundish fruit, about 3 inches in diameter, pink outside and in. Very sweet flavor, seeds relatively soft, quality very good.

### **Francis**

Originated in Jamaica via Florida. Large, sweet, split-resistant fruit. Prolific producer.

### **Granada**

Originated in Lindsay, CA. Introduced in 1966. Bud mutation of Wonderful. Fruit resembles Wonderful, but displays a red crown while in the green state, darker red in color and less tart. Ripens 1 month earlier than Wonderful. Flowers also deeper red. Tree identical to Wonderful.

### **Green Globe**

Originated in Camarillo, CA. Selected by John Chater. Large, sweet, aromatic, green-skinned fruit. Excellent quality.

### **Home**

From the University of California, Davis, pomegranate collection. The fruit is variable yellow-red in color, with light pink juice that is sweet and of rich flavor. Some bitterness.

### **King**

From the University of California, Davis, pomegranate collection. Medium to large fruit, somewhat smaller than Balegal and Fleshman. Skin darker pink to red. Flavor very sweet. Has a tendency to split. Bush somewhat of a shy bearer.

### **Phoenicia (Fenecia)**

Originated in Camarillo, CA. Selected by John Chater. Large fruit, 4 to 5 inches in diameter, mottled red-green skin. Flavor sweet, seeds relatively hard.

### **Sweet**

Fruit is lighter in color than Wonderful, remains slightly greenish with a red blush when ripe. Pink juice, flavor much sweeter than other cultivars. Excellent in fruit punch. Trees highly ornamental, bears at an early age, productive.

### **Utah Sweet**

(Also known as Dixie Sweet)

Very sweet, good quality fruit. Pink skin and pulp. Seeds notably softer than those of Wonderful and other standard cultivars. Attractive pinkish-orange flowers.

### **Wonderful**

Originated in Florida. First propagated in California in 1896. Large, deep purple-red fruit. Rind medium thick, tough. Flesh deep crimson in color, juicy and of a delicious vinous flavor. Seeds not very hard. Better for juicing than for eating out of hand. Plant is vigorous and productive. Leading commercial variety in California.

## References

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