

# TEXAS FRUIT & NUT PRODUCTION

AgriLIFE EXTENSION

Texas A&M System

## Pomegranates

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### Introduction

The pomegranate, *Punica granatum*, is native from Iran to the Himalayas in northern India and has been cultivated since ancient times throughout the Mediterranean region of Asia, Africa and Europe. The fruit was carried in desert caravans for its thirst-quenching juice, appears in Egyptian mythology and art, and is referenced in the Old Testament of the Bible. From Spain, it was introduced into the Americas by Spanish missionaries during the sixteenth century. Its



colorful, orange-red flowers and dense, bushy growth habit make pomegranate an attractive ornamental. Pomegranate has renewed interest today as a commercial orchard crop, because of the health promotions associated with its high level of antioxidants in the pulp or juice.

Pomegranate is a member of the Lythraceae family which includes about 620 species. The family also includes the widely cultivated crape myrtle trees. While pomegranate can be trained as a small tree, it is more commonly grown as a bushy shrub. The leaves are deciduous, usually glossy and dark green. The plant usually has spines (thorns) along its branches.

The fruit may be yellow to bright red in color, and up to about 4 inches in diameter. The rind is smooth, but leathery, with a persis-



tent, tubular calyx at the blossom end. The numerous seeds are surrounded by a white, pink to purplish or crimson pulp which is juicy, sweet and variable in acidity acid. In fact, some can be quite tart.

Pomegranate is common to the tropics, subtropics and subtemperate regions, and is well adapted to areas with hot, dry summers.

It is more cold hardy than citrus but less hardy than many other deciduous fruits when grown in temperate regions. Some varieties can tolerate temperatures as low as 10 degrees Fahrenheit but others may be damaged at 18 °F. For best flower and fruit formation, pomegranates



should be grown in full sun.

Because of its variance in cold hardiness, some varieties may survive typical winters in north central Texas, especially the ornamental types which produce only small, obscure or no fruit. Fruiting types should survive most winters throughout south, central and southeast Texas, but may be damaged regularly in northern parts of the state. The frequency and occurrence of severe freeze events in Texas is very erratic.

### **Soil Adaption**

Pomegranates are well-adapted to most every soil that has good internal drainage. They grow very well on the moderately alkaline soils of south Texas and northern Mexico, as well as slightly acidic soils in East Texas.

Some pomegranates have more salt tolerance than many other commercial fruit crops, but varietal differences among the many new varieties in Texas are unknown. Soil nutrition and salinity on new sites should be tested to aid in appropriate future water and nutritional management decisions.

### **Site Preparation and Planting**

Orchard sites should be prepared well in advance of planting by killing out perennial weeds and grasses and deep ripping the soil to insure break-up of any hard pans. Space plants 12 to 15 feet apart in rows, with rows 15 to 20 feet apart. Overcrowding of adjacent plants will hinder light interception and production.

Since pomegranate plants will most likely be sold as container-grown in soilless media, it is best to wash most of this potting medium from the root ball so as to expose the peripheral roots to the soil in which they must go. Such plants should commence growth soon after planting, in contrast to those that are simply planted directly from the nursery container with the entire root-ball intact. The plants should be thoroughly watered at planting and again every few days for the first couple of weeks, after which the interval between waterings can be lengthened gradually and should be tailored to the water-holding capacity of the soil.

### **Propagation**

Pomegranates root readily from hardwood cutting taken in winter when pruning;. Size of rooting wood does not seem to matter although pencil sized cuttings are easiest to work with. Cuttings should be about 6 to 14 inches long, dipped in rooting hormone and stuck in containers with a well drained potting soil. The cuttings can be left outside to callus. In spring after growth commences the cuttings can be stepped up into gallon containers and allowed to grow 4 to 6 weeks before going to the field.

### **Cultivation**

At establishment, the plants shouldn't require watering more frequently than every 7 to 10 days. To facilitate watering, construct a ring of soil several inches thick and high, a couple of feet in diameter, around the newly planted tree. Then just fill the ring with water as necessary. The ring will melt into the surrounding soil within a few months, by which time the young plant will have become established. If using drip irrigation, one, 1 -gallon per hour

emitter per tree should be sufficient the first year or two; gradually increase this to at least four emitters when the plants are 4 to 5 years old. Plants come into production in 3 to 4 years and are long lived.

Fertilize lightly with nitrogen after growth commences. Generally, one to two cups of ammonium sulfate in the first year should be sufficient, especially if it is split into three to four applications. Use about twice as much fertilizer in the second year and three times as much in the third year. Split applications in February, May and September are adequate. Fertilize established plants as needed to maintain 12 to 18 inches of terminal growth. For most plantings, nitrogen fertilizer will be the only nutrient applied annually. Soil tests should be taken when growth does not respond to good management and fertilizer.

To enable rapid establishment, all other vegetation should be removed within a one to two-foot circle of the young pomegranate. Turfgrass can be killed initially with a systemic contact herbicide, followed by mulching with organic material or fabrics to prevent weed and grass competition as well as to conserve soil moisture.

Pomegranates are best grown as bushes. Select 3 to 5 suckers or trunks as growth begins and remove all the other shoots. Because pomegranate suckers profusely from the crown, frequent sucker removal will be necessary. Annual pruning of bearing pomegranates should be performed to maintain the major scaffold branches and to thin out the growth as well as remove dead or damaged shoots. Concentrate on removing interior shoots so as to maintain the major scaffold limbs.

Increased growth should result in increased fruit production. Fruit maturation will occur in September for early ripening varieties and continue through October for later-ripening ones. Appearance is important, especially where pomegranates may be purchased primarily to enhance table arrangements and other fall (harvest-time) decorations. Too much sun exposure causes sunscald;



Sunburned fruit

brown, russeted blemishes and roughening of the rind. Applications of a sunburn material such as kaolinite clay may be needed in many locations.

Pomegranates are commonly eaten fresh, but one emerging trend in the commercial industry may be to sell bags of arils for fresh consumption. Some of the new varieties have soft seeds which could be consumed with the fleshy pulp. Fruit can also be juiced as the juice has many healthy properties. The juice may be made into a beverage or syrup, and can be blended with other juices. The pomegranate is equal to the apple in having a long storage life. It is best maintained at a temperature of 32° to 41° F.



Heart rot

### Pests

Excessive rain during bloom and the ripening season may induce soft or heart rot, *Rhizopus arrhizus*.

Minor problems are leaf and fruit spot caused by *Cercospora*, *Gloeosporium* and *Pestalotia* sp.; also foliar damage by whitefly, thrips, mealybugs, stink bugs and scale insects; and defoliation by *Euproctis* spp. and *Archyophora dentula*. Termites may infest the trunk. In some countries, paper or plastic bags or other covers are put over the fruit to protect

them from borers, birds, and rodents.



Leaf-footed bugs attacking fruit.

The most serious problem with pomegranate is the occurrence of a fungal disease which affects both the leaves and the fruit, causing premature leaf loss and also resulting in fruit splitting on the plant. While the leaf drop may be tolerated, fruit splitting cannot, since the splitting usually occurs just as the fruit begins to mature. Copper fungicide use during fruit development of late spring through summer may alleviate the problem, but control of the disease is presently not fully understood.

## VARIETIES

**Wonderful**, an American variety has been the main commercial variety to date. It produces a vigorous plant with a consistent number of fruit. Fruit are large and process well though there tends to be a bit of waste. A lack of sufficient cold hardiness and splitting of the fruit near maturity has been an ongoing problem in Texas.



**Salavatski**, originates from Russia, and is a large red fruit with reddish arils. Taste is typically sweet with just



a hint of tartness. It has good cold hardiness and ripens in mid October. This variety is also called Sal and/or Russian 8.

**Surh Anor**, also Russian in origin, is consistently productive and produces a large fruit. Arils are usually alternately clear and red speckled. Ripens in mid October and has a high sugar content.



**Al – Sirin – Nar**, from Russia has glossy red fruit which contain rosy-pink arils with a sweet-tart taste. It is a vigorous plant that has produced some of the best yields date. It ripens in late October.



**Russian 18** is a cold hardy plant that produces medium to large fruit with a bright red skin and a very good sweet-tart taste. It appears to be adapted over a wide area of Texas and bears at an early age. It too comes from Russia.



**Spanish Sweet-Uvalde** produces large red fruit and arils with hard seed. The fruit has a sweet, but very tart taste. The plant is cold tolerant and very productive and rip-



ens in mid October. This variety was disseminated as “Spanish Sweet” from the Texas AgriLife Research and Extension Center at Uvalde.

**Sumbar** is an early ripening variety with sweet fruit and soft seeds. It has survived very cold winter conditions in the Fredericksburg area, but one should be aware of potential cold injury problems if moved too far north. Sumbar come from Turkmenistan.



As there is no quarantine on pomegranates, named varieties are available through mail order from out-of-state nurseries if you cannot locate plants locally.

### **Rootstocks**

Plants root readily from hard wood cuttings in the dormant season and plants have performed well on their own roots to date, so rootstocks have not been necessary.

### **Harvest**

Fruit ripening normally occurs 6 months after bloom with the best fruit development occurring during high temperatures. The fruit is non-climacteric and should only be picked after it has reached full maturity. Fruit ready to pick may make a metallic sound when tapped lightly. Fruit are harvested by cutting the fruit from the plant as opposed to pulling. Cut the fruit off as close as possible to avoid leaving a stem which could rub and injure other fruit.

Pomegranates store best at 40 to 45 degrees F with a relative humidity of 85 %. Fruit can be stored for up to three months. The first economical harvest occurs in about the fourth year when a small crop of 20 - 25 fruits (10 lbs) per tree may be harvested. In the 10th year, it rises to 100 - 150 fruits (50 lbs). The average yield in well managed orchards may be as much as 200 - 250 fruit per tree or about 75 lbs.

### **For More Information**

<http://aggie-horticulture.tamu.edu/fruit-nut>