

Citrus – California's Sunshine

By Anne-Marie Walker

What says “sunshine” more than a bowl of citrus on our kitchen counter? Citrus is notable for fragrance found in blossom, leaf and fruit. Each of us has experienced the sudden fragrant and intoxicating haze created as we peel an orange. This volatile, flammable oil is generally toxic to bacteria and insects and is a plant defense mechanism. Fortunately, over time, we humans developed positive responses to citrus as do bees hungry for citrus nectar.

Citrus, native to Asia, was first introduced in the West by Alexander the Great in the Third Century BCE. Part of the Rutaceae family, Citrus was first planted in California by Franciscan missionaries in San Diego in 1769. Citrus was so successful in California that by 1869, just 100 years later, USDA records indicate 17,000 orange trees and 3,700 lemon trees flourishing in California. Today, there are approximately 430,500 bearing acres of citrus trees in California. Only Florida surpasses us in production with the majority of their crop made into juice.

Recent genetic data suggests lemons, limes, sour oranges, sweet oranges and grapefruit types are all hybrids of three primordial species in the citrus subgenus: the mandarin (*C. reticulata* Blanco), the citron (*C. medica*) and the pummelo (*C. maxima*). Most citrus flowers have both sexes within a single flower. Within the anthers, the pollen holds the male parts while the pistil, the female part of the flower, contains the ovary at its base. Each segment of citrus is a carpel or segment of the ovary.

Functional pollen and ovules differ among citrus varieties. Further complicating matters of citrus sex, many varieties are self-incompatible which means no fertilization or seed development unless, of course, the self-incompatible varieties are planted near other varieties that can cross-pollinate them. I discovered this in my garden where my navel oranges, which produce no functioning pollen and set fruit without that stimulus, are planted near my Meyer lemons, Bearss lime and mandarins. The result is an occasional seedy navel orange. Navel oranges are not the only fruit which can develop fruit without fertilization. This genetic trait is also shared with bananas and other “parthenocarpic” plants including seedless grapes.

Citrus trees are propagated asexually, grafting rootstock selected for hardiness with scion selected for high quality fruit. After grafting, the tree will produce fruit in about five years. Mature tree size depends on the scion and rootstock with standard growing to 30 feet tall, semi-dwarf to 15 feet tall and dwarf reaching 10 feet tall. The size of the fruit of each of these trees is much the same; that is to say an orange grown on a dwarf is the same as an orange grown on a standard. But, the fruit of the various hybrids varies greatly with some almost as big as a volleyball (pummelos also known as Chinese grapefruit) and others as small as caviar (Australian Fingerlime). The small Kumquat, by the way, is classified in the group *Fortunella*, a relative to the genus *Citrus*.

Since 1910, the University of California has fostered the Citrus Variety Collection located at UC Riverside, Irvine and Thermal, California. Over 1800 trees, two of each type, represent an invaluable genetic resource helping UC to fulfill its mission to acquire, preserve, distribute and evaluate genetic diversity within *Citrus*. For more information, go to www.citrusvariety.ucr.edu/citrus/index.html

The cultural requirements of citrus include:

- 6 hours of sun, preferably south facing exposure
- high summer heat to develop sugar
- low winter temperatures to cause acid levels to drop – but avoid freezing
- grow best with temperatures between 70 and 90 degrees F

Planting and care of citrus is as follows:

- Plant citrus preferably in spring permitting roots to establish before cold weather.
- Plant root ball just a bit above grade and build water basin wider than the spread of the leaves. Note, citrus do well in 5 gallon or bigger containers.
- Water about once a week during warm weather enough to moisten entire root area. Remember, roots of citrus extend up to twice as far as drip line and are shallow.
- Mulch – citrus do well with yard waste like grass clippings
- Fertilize at least four times a year. Monthly fertilization with citrus blend improves vigor.
- Prune in summer to shape trees, removing twiggy branches and crossed branches. Also remove stems appearing below graft union.
- Harvest oranges from December through May, limes from August through March, mandarins from January through April and lemons all year round. Remember you need not harvest the fruit all at once. Because citrus fruit contain little starch, they must reach a desired sugar-acid ratio before harvest. Once picked, they will not sweeten whereas citrus left on the tree will get sweeter.

Citrus trees have relatively few pest and disease problems. The best defense is proper irrigation and fertilization. Common citrus pests include whiteflies, thrips, mites, and rots. These bring black sooty mold on the rind of the fruit which can just be washed off. Snails and slugs will eat flowers and fruit. Pick them off in the early morning. Aphids, scale, or spider mites may infest a tree. Tanglefoot controls ants and hence, scale. If the tree suffers from scale, you can cut it out. Pruning to allow sun into the interior of the tree helps prevent scale infestations. Keep a look out for a new invasive, the Asian citrus psyllid. It is a small brown insect about the size of an aphid and can jump or fly. It causes irregular yellowing of leaves and inedible, bitter deformed fruit. There is no cure and the tree should be destroyed. Lastly, fruit quality can be impacted by several factors. Remember, citrus bloom largely in spring. Thick rind, puffy fruit and sheepnose can occur with off-bloom fruit, set from a summer or fall blossom. Simply discard this fruit. Fruit splitting is caused by dry weather followed by a good rain. Proper irrigation practices best mitigate these problems.