

## Tropical Crops - Section Review

Like the small fruits, tropical crops are a group of botanically unrelated crops. They are grouped together merely because they are the major crops of tropical/subtropical adaptation of importance in the world. While some of these are rather unfamiliar to us in the United States, they are major commodities worldwide, and form a substantial part of the export economy of several developing countries. Go back to the "Top 20" crops list and count how many crops are tropical!

While it is difficult to generalize about such a diverse set of crops, a few important concepts from this section are:

- Other than citrus fruits, all crops in this section are adapted to the hot, tropical lowlands. Citrus is of tropical origin, yet achieves its best quality when grown in the subtropics, or at higher elevations (cooler) of the tropics. The reason citrus does better in subtropics is that cool winters enhance fruit quality and help synchronize growth. Citrus in the tropics may produce new growth and flower several times per year, complicating management. In Florida and California, citrus produces growth flushes and flowers at predictable times. It is common to see all stages of development at any given time in banana/plantain, pineapple, and papaya, although mango trees generally bloom at a defined time even in the tropical lowlands.
- There is continuous harvest, hence supply, of banana, plantain, papaya, and pineapple. On these plantations, plantings are started at regular intervals so that as one field is harvested, another is just coming into maturity. The exception is papaya, which has all stages of fruit development present on any given plant, so not as much attention need be paid to the timing of planting there. Note that these plants are also all herbaceous, and fruit relatively soon after planting (several months), very different from the tree crops citrus and mango which require a few years to come into bearing.
- Polyembryony is found in citrus and Indochinese mangos. This results in multiple seedlings per seed, most of which are exact clones of the maternal parent. This is a boon for nurserymen who desire uniform, easy to propagate stock, but a bust for breeders as the zygotic embryo, derived from making a cross, rarely germinates and grows out. Thus, many cultivars of citrus and mango are chance seedlings or mutations, not the result of breeding efforts.
- Parthenocarpic fruit development is seen in banana, plantain, pineapple, and some citrus like Persian limes, navel oranges, and some tangerine hybrids. Take a minute to peruse "parthenocarpy" in the glossary.

- Tropical fruits as a rule are very high in vitamin C (pineapple is an exception). This compound is an “antioxidant”, and may be high in tropical plants due to the high temperature, high light climates in which they grow; these conditions promote oxidative stresses in plants.
- “Chilling injury” is a common theme in tropical fruits. Most temperate fruits store longest right around 32°F, and are injured only if they freeze. Many tropicals are injured by low, nonfreezing temperatures in the 55°-32°F range. Chilling injury results in surface pitting, browning of the peel and flesh, and generally faster post harvest decay. Thus, temperature control post harvest is more critical with tropical fruits than temperate fruits.
- Most tropical fruits are highly perishable, due to the higher storage temperatures (see last comment) and their general nature. Citrus, on the other hand, is a good example of a “non-climacteric” fruit, which ripens slowly and evenly, not going through a burst of respiration, softening, and color change right at the end of development. Thus, citrus can be “stored” on the tree for several months, widening the market window for the crop and allowing the grower greater marketing flexibility.
- Tropical fruit crops are obviously not very cold hardy; except citrus, all are killed by just a few hours in the upper 20's °F. Some citrus cultivars can survive into the low 20's to high teens. Also, tropicals do not have a chilling requirement as do temperate fruits, and never go into a truly dormant state. Even if the top of the plant is not growing, the roots generally are growing. However, most tropicals will stop growth when temperatures fall below 55°F due to unfavorable conditions *outside*, not a hormonally induced dormancy *inside* the plant, like temperate zone species.
- Pineapple, banana, and plantain are *monocotyledonous* plants, and thus are more closely related to grasses than other fruit crops, which are dicots. Note too, that these plants are herbaceous and lack vertical stems like many bunch grasses. The “trunk” of a banana “tree” is actually the concentrically arranged bases of the petioles, collectively. That’s why it’s called a “pseudostem”.