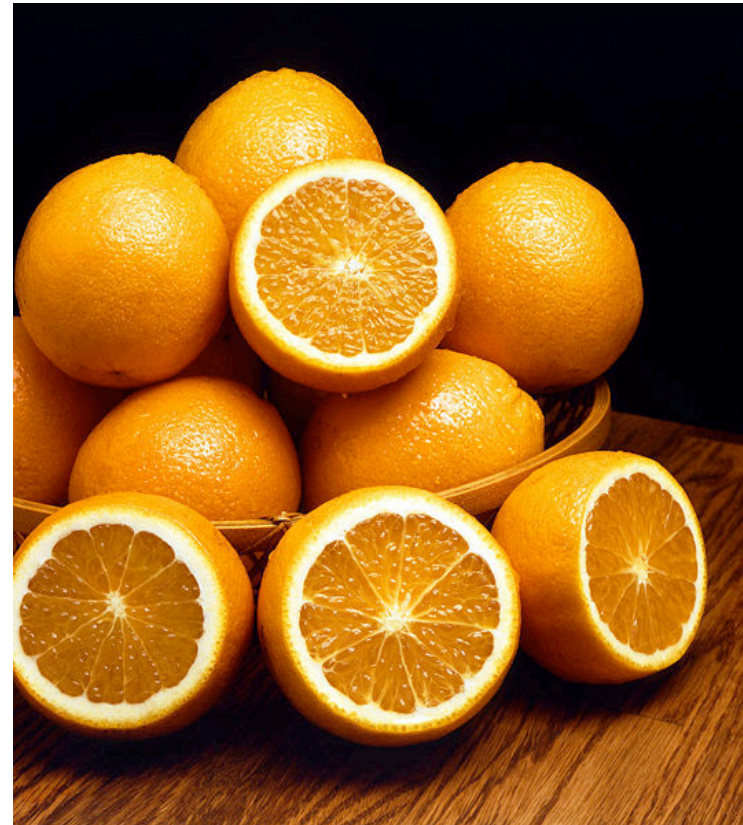


Citrus sinensis: the sweet orange



Family: Rutaceae

Small trees and shrubs

Most important genus is

Citrus

highly fragrant flowers

divided into four or five parts,

insect pollinated, radially

symmetric, generally

hermaphroditic



Sweet Orange tree:

Alternate evergreen leaves, 10m tall

After blooming, fruit development takes between 5 and 18 months

Fruit is a berry: produced from single ovary, ovary wall becomes fleshy pericarp



Hybrid Origin:



3 “True” *Citrus* species:
C. reticulata (Mandarin), *C. maxima* (Pumello), *C. medica* (Citron)

Citrus sinensis = *C. reticulata* + *C. maxima*

Evidence suggests hybrid origin occurred in Southeast Asia, Northeast India, and Southeast China

Sweet Orange Cultivars

- Common Oranges
 - Known as “round oranges” in Florida, “blond oranges” in Europe
- Navel Oranges
 - Small, secondary fruit embedded in stylar end of primary fruit
- Blood Oranges
 - Distinctive red flesh, primarily grown in Mediterranean
- Acidless Oranges
 - Minor importance, many say they are sweet but insipid



Historical Uses



- Citron seeds found in Mesopotamian excavations dates to 4000 BC
- earliest references to oranges found in ancient Chinese manuscripts, about 2200 B.C

- Introduced into Europe after Indian conquests of Alexander the Great
- Survival and spread in the Mediterranean is a fringe benefit of the Jewish diaspora (etrog used in Sukkot ritual is a citron)
- Japanese believed citrus blossoms represented chastity
- Arab women used it to color gray hair
- Nostradamus wrote about how to use its blossoms and fruit to make cosmetics
- Hercules so valued it, he stole the golden fruit from Hesperides, who protected it as the primary food of the ancient Roman and Greek gods

'Drink an Orange'



Albert Lasker

- Early 1900's, advertising tycoon, sold slogan to Sunkist
- Invented orange juice in response to overproduction of citrus fruit
- Cultural/Scientific Prerequisites of pasteurization and efficient distribution mechanisms

- Valencia orange is the leading cultivar in Florida as well as around the world
- Natural orange juice costs, wholesale, between \$5-\$6. US market alone is about \$9 billion

Florida Citriculture

\$9 billion industry

Florida produces about 80% of US sweet oranges

95% of Florida oranges used for processing (mainly for juice)



The threat of frost: When the air temperature remains below 26 degrees F for at least 3 hours, the juice inside freezes

In late 1984/early 1985, the entire citrus industry in Florida destroyed by frost. First frost, fruit crop lost. Second frost less than one month later, trees died.

It took 16 years to return to previous production level



Citrus Canker

- Caused by the bacterium *Xanthomonas axonopodis*
- Originated in Southeast Asia, but has infected more than 1 million trees in Florida
- 3 strains, spread by wind-driven rains



- Nontoxic: Does not affect the flavor or maturation of fruit, but the appearance of it.
- In 2002, FL governor Jeb Bush made executive decision to destroy diseased trees

Citrus as Medicine



- Folic Acid: 12% of daily value for growth factor per fruit
- Calcium: 19mg/100mL of juice
- Polyphenols as antioxidants: Vitamin C (ascorbic acid)
- Phenolic antioxidants: inhibit proliferation of a number of different cancer cell lines. Citrus flavanoids help to prevent breast cancer
- OJ fortified with plant sterols reduces levels of LDL cholesterol

