

Tropical and Subtropical Fruit

Citrus, Pineapple and Guava

Citrus - the main subtropical juice crop

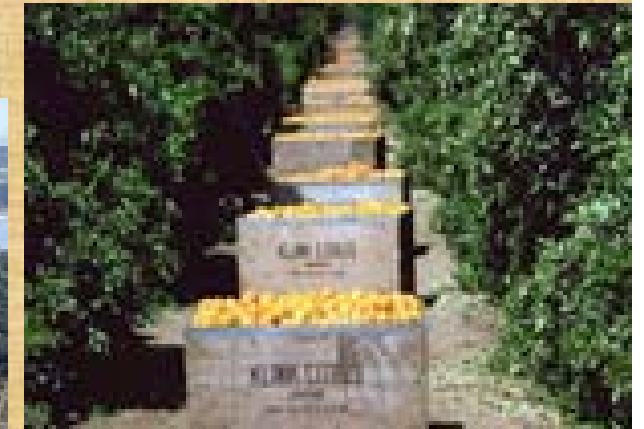
Citrus sinensis - sweet orange,
China

Citrus limon - lemon , India

Citrus aurantifolia - lime, India

Citrus paradisi - grapefruit, a
pomelo X sweet orange found in
West Indies

Citrus trees are 2 to 8 m tall, evergreen, spines on seedlings.



Climate subtropical best, 0 to 40 N/S latitude, cool dry period to initiate flowers

Fruit is a berry, with many juice sacks, hi vit.C

Trees usually grafted for size control, flavor, disease

Pruning for size, shape, and disease control.

Tree life 25 to 40 yrs, lime less

Limonene is a byproduct of orange juice processing and used a solvent in cleaning products

World Production 2009

Oranges Citrus sinensis origin China/India

68 M Mt

Brazil, 18 M Mt

USA, 8.3 M Mt (\$1.6B)

India, 5.2 M Mt

Limes, *Citrus aurantifolia* (key lime) continental southeast Asia

C. latifolia (Tahiti lime), Lemon *C. limon*

14 M Mt

India, 2.6 M Mt

Mexico, 2. M Mt

China, 1 M Mt

US 0.8 M mt (\$330M)

Grapefruit and Pomelo

World production 6.6 M mt

China 2.8 M mt

US 1.2 M mt (\$266M)

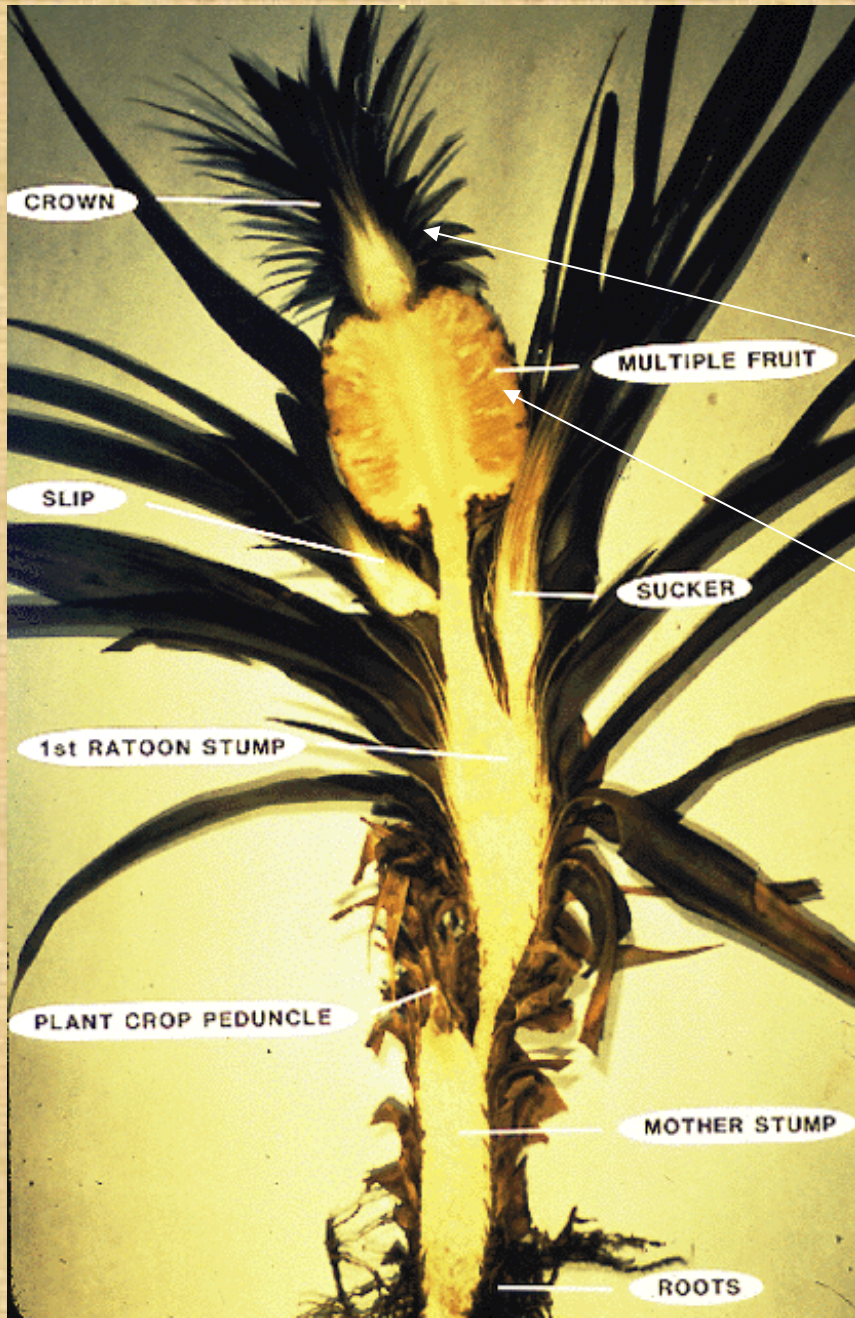
Mexico 0.4 M mt

Pineapple - Hawaii's contribution

- *Ananas comosus* from South America to HI in 1813, commercial by 1850, Dole starts in 1900.
- Perennial herb, 1 m tall
- Adapted to low rain- 50 to 200 cm/yr, sea level to 800m
- Fruit is fused fruitlets lacking seeds unless cross-pollinated.
- Flowering induced by spraying hormone- ethylene



Hawaii pioneered commercial production based on canning the acidic 'Smooth Cayenne' sweeten with sugar cane. Then production moved to lower cost countries growing sugarcane to sweeten product
HI switched to low acid 'gold' types for fresh and minimally processed products which require excellent



World Production, 18.2 M Mt
 Philippines 2.2
 Thailand 1.9 M Mt
 Costa Rica 1.9 M Mt
 Hawaii, 0.2 M Mt
 (\$50M)

Guava

- *Psidium guajava* native to American tropics, in HI 1820
- Shrub to 6-9 m tree, single perfect flower
- Fruit is many seeded berry, hi vit. C
- Pruning is to control height and in HI to induce flowering.
- No world data- India 1.8 M mt, Mexico 0.3 Mmt, Brazil 1 M mt
- Production 2009
 - Hawaii 0.0001 M Mt
 - US imports Brazil, 0.002M Mt
 - US imports Ecuador, 0.002 M Mt
- Uses
 - Sweet types are dessert fruits
 - Acid types like ' Beaumont' are for juice,
 - both high in vitamin C, a leaf tea is used for controlling diarrhea



Before and after pruning to induce flowering



Harvesting by hand and shake harvesting.