INSTANT INFORMATION

COOPERATIVE EXTENSION SERVICE
COLLEGE OF TROPICAL AGRICULTURE
UNIVERSITY OF HAWAII

Fruits and Nuts Series #2

ORANGES FOR THE HOME GARDEN IN HAWAII

Orange trees grow well in Hawaii from sea level up to approximately 2500 feet as long as they have a warm, sunny location, adequate moisture, and well-drained soil. In wet, cloudy areas above 1500 feet elevation, the fruit quality is low, the acidity of the fruit is high, and the sugars are lower than in sunny areas. Cool night temperatures for 3 weeks or more during the ripening period are important for good fruit color; when the nights are warm, the fruit often remains green, the sugars are used up in respiration, and much of the acidity is lost, resulting in insipid or flat-tasting fruit at maturity. To avoid flatness, pick oranges before they are fully ripe and while they are still somewhat green.

Varieties: Navel oranges are most popular with the consumer because they are easy to peel and have few or no seeds. Washington navel is a widely planted cultivar in the home garden; it ripens from October to December at low elevations. Other navel oranges available are 'Thompson' and 'Robertson,' both bud sports of the Washington, and local Hawaiian selections, such as 'Tabata' and 'Cooksey.'

Navel oranges are mostly eaten out-of-hand. If made into juice, they should be consumed while fresh, because after several hours, the juice develops bitterness as a result of being exposed to air. Juice from immature fruit or from trees grafted on rough lemon rootstock is more likely to become bitter. However, bitterness is not a problem in Hawaii with varieties other than navels.

Common oranges, such as the 'Valencia,' are important commercial juice sources in Florida and California, but they are not very satisfactory in Hawaii. Common oranges hang on the tree and keep their quality longer than navels, but they have a higher heat requirement and are usually too sour for most tastes. The pigmented (blood) oranges are not recommended because red color does not develop in Hawaii's mild temperatures and high humidity. The so-called Hawaiian, or 'Kona Sweet,' orange, which was shipped to California in the gold rush days, is quite seedy but satisfactory for juice.

Rootstocks: Sweet orange propagated by air layers, rooted cuttings, or seedlings is not recommended because it is very susceptible to soil-borne diseases caused by Phytophthora species. Rootstocks tolerant or resistant to the foot rot and gummosis diseases caused by the Phytophthora organisms include 'Carrizo' and 'Troyer' citranges, 'Rangpur,' 'Cleopatra' mandarin, and Heennaran. Orange scions or buds used on these rootstocks should be grafted or budded 12 to 18 inches above the ground to prevent fungus contamination of the susceptible orange scions. When planting trees, make sure the graft union is 12 to 18 inches above the soil level. Another rootstock, rough lemon, is not recommended for oranges because of susceptibility to Phytophthora; in addition, it reduces the quality of fruit grown on it.

Planting: Orange trees need full sun at least half the day for good results. Each tree should be spaced 15 to 18 feet from walls, hedges, and other trees. Dig a hole about 2 feet deep and 3 feet in diameter for each plant in 5-gallon container size. Loosen the soil in the bottom and mix with it 1/2 pound of treble superphosphate and a few ounces of a complete garden fertilizer, such as 10-10-10 or 10-20-10. Replace half the soil removed from the hole. Some compost may be mixed in with the soil before replacement. Set the tree in the center, spread

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the roots out in all directions, and add the remaining soil. Press the soil around the roots to exclude air pockets, then water well. After the soil settles, the tree root crown should be at the same level as it was in the container. In windy areas or where the sun is hot, the tree should be protected with a burlap canopy and wind shield until well established.

Water and fertilizer: Make an irrigation furrow around each tree about 2 1/2 or 3 feet from the trunk. Check the tree daily, and water when needed. After 1 month add 2 to 4 ounces of complete fertilizer, broadcasting around the tree or in holes not closer than 18 inches to the trunk. Repeat this procedure every 3 months. Keep weeds and grass away from the tree and outside the watering furrow. When the tree is established, water weekly, soaking to 2 feet each time. The amount of water that is applied to lawns is usually not adequate for trees.

Fertilize bearing trees 2 or 3 times a year: in December or January before bloom time; in April or May when the fruit is rapidly increasing in size; and again in September. In high rainfall areas, smaller and more frequent applications are recommended. Phosphate moves very slowly in the soil, so place it in the root zone; apply 1 to 2 pounds of supplemental phosphate once a year in a 3- or 4-inch deep hole around the tree under the tips of the branches. Replace the soil, and water. Nitrogen and potash are more soluble and tend to move down with the water and can be applied on the surface.

Other nutrients: Magnesium, calcium, and sulfur are needed by trees in moderate amounts, and complete fertilizer usually supplies enough calcium and sulfur. Epsom salts are a good source of magnesium. These nutrients may be mixed into the soil before planting.

Elements needed in minute amounts (micronutrients) may be deficient if the soil is too alkaline, that is, above pH 7.0 or 7.5. Zinc, iron, manganese, and copper are in this class, and soluble (chelated) forms of these elements are available at garden shops; they may be applied as a foliar spray or mixed into the soil. Strongly acid soil, that is, below pH 5.5, may make phosphate, calcium, and magnesium less available (fixed) to the plants. If in doubt, have a sample of the soil tested for pH. Finely ground lime will sweeten acid soils.

Diseases and pests: Melanose, scab, and fruit rots may be controlled with fungicide sprays, such as benomyl (Benlate), zineb, or captan. Sanitation, such as removal of diseased fruit, dead branches, and other sources of infection, is essential for control of these diseases.

Aphids, Chinese Rose Beetle, scale insects, ants, and the newer pests, the citrus swallow tail and the orange spiny white fly can be controlled with insecticide sprays such as malathion, diazinon, and carbaryl (Sevin). A combination spray of 2 tablespoons of a superior type spray oil (Volck oil Supreme) plus 2 teaspoons of either malathion (50%-57%) liquid or diazinon (25%) liquid to each gallon of water has been found effective in controlling most pests of citrus. For rust, broad, and spider mite control, insecticidal sprays of wettable sulfur, chlorobenzilate, or kelthane may be used.

Read and follow carefully the instructions on the package.

Ref: The orange spiny whitefly in Hawaii, Farm & Home Insect Pests Entomology Notes No. 7, Aug. 1974 by Dr. Albert LaPlante.

Robert M. Warner
Professor of Horticulture

Warren Yee
Specialist in Horticulture