



## Tree Tomato (Tamarillo)

Scientific name: *Cyphomandra betacea* (Cav.) Sendt.

Family: Solanaceae

Origin: Peruvian Andes and Bolivia

The tree tomato is a shallow-rooted tree that can reach a height of 20 feet. The wood is brittle and the trees are short-lived, usually lasting from 12 to 15 years. The almost heart-shaped leaves can reach a foot or more in length and a width of up to 5 inches. The fragrant flowers, up to ½-inch in diameter, can be pink, light blue, or white and are usually borne near the tips of the branches. The red, yellow, orange, or purple fruit is long-stemmed, 3 inches long by 1½ inches wide, and generally ovoid with somewhat pointed ends. The seeds are thin, flat, and hard. The tree is related to poha, tomatillo, and lulo. The name tamarillo was devised in 1967 in New Zealand for marketing purposes.

Poha (*Physalis peruviana*) was observed growing in Hawai‘i by the naturalist Andrew Bloxum in 1825. Sharing a geographic point of origin with tree tomato, there is some speculation that it might have been introduced to Hawai‘i around the same time, both fruits having been referred to as “lost crops of the Incas,” who cultivated the trees prior to Columbus finding the New World.

### Cultivars

The tree tomato does not grow true from seed, resulting in wide variation in fruit color and size. In New Zealand, ‘Red Beau’ (1991) and ‘Kaitaia Yellow’ (1981) are popular cultivars. Selections found in California and Florida include ‘Rothamer’, ‘Oratia Red’, ‘Inca Gold’, and ‘Ecuadorian Orange’. Breeding programs in Brazil have also produced local selections.

### Environment

The tree tomato is a subtropical plant that is usually found at from 1000 to 10,000 feet elevation in its native envi-

ronment. In Hawai‘i it is found at 200–4000 feet elevation. Trees at lower elevations tend to produce more but smaller fruits. The plants grow best in a lightly compacted soil with good drainage. The roots will not tolerate standing water, which may kill the tree in a matter of days. Protection from wind is essential for these shallow-rooted trees. Brittle branches are also susceptible to winds, especially when laden with fruit. Trees will produce fruit after 18 months, but it is considered advisable to sacrifice the first year’s crop to strengthen the root system and develop the plant. Trees in New Zealand’s large commercial plantings are short-lived, lasting only 4–6 years. In Hawai‘i, trees will produce for up to 15 years with proper care and nutrition. On average, a cluster of 20 flowers will produce only four or five fruits. Flowers will abort if not pollinated. It takes approximately 25 weeks from fruit set to maturity.

### Horticulture

New Zealand’s commercial harvest of tamarillo averaged 1500 metric tons in 2004 with 100 tons being exported and 100 being processed. The remainder was sold as fresh fruit.

Seedlings are field-planted when they are 2–5 inches tall and are spaced 6–10 feet apart. In windy areas, they are often planted closer together. The first year’s flowers are often removed. Bone meal is commonly used when planting in New Zealand. Trees are cut back severely each year to a height of 3–4 feet to encourage branching. In Hawai‘i, a quarterly application of ½ pound of organic 6-6-6 fertilizer is recommended. In the fifth year of growth, additional application (2–3 pounds) of mixed phosphate, nitrate of soda, and sulfate of potash

is recommended. Annual pruning should be done to remove branches that have previously fruited. Judicious pruning can also help to extend the fruiting season and facilitate harvesting. Irrigation is needed only in periods of drought. Mulching will alleviate tree stress under drought conditions. The tree grows best in organically rich, light soils.

### **Pests and diseases**

The tree tomato is susceptible to a number of problems, which can be controlled with proper care. Fruit flies will attempt to lay eggs in the fruit. The tough skin offers protection, but this makes the fruit unattractive for marketing as fresh fruit. Use of strategies recommended by the Hawai'i Area-Wide Fruit Fly Pest Management Program (HAW-FLYPM) can be very effective in preventing damage to fruit. The most common problem, powdery mildew (*Oidium* sp.), can be addressed with applications of commercial insecticidal soaps and neem oil sprays. Root-knot nematodes (*Meloidogyne* sp.), root rot, crown rot (*Phytophthora* sp.), and wilt from *Pseudomonas solanacearum* also affect the plant. Good cultural practices should help to stave off these problems.

### **Propagation**

Tree tomatoes can be propagated by cuttings of 1–2-year-old growth and by seed. Tissue culture is practiced in New Zealand. Seeds tend to produce taller trees, better suited to protected areas, while trees from cuttings tend to be shorter and bushier, making them better for windy areas.

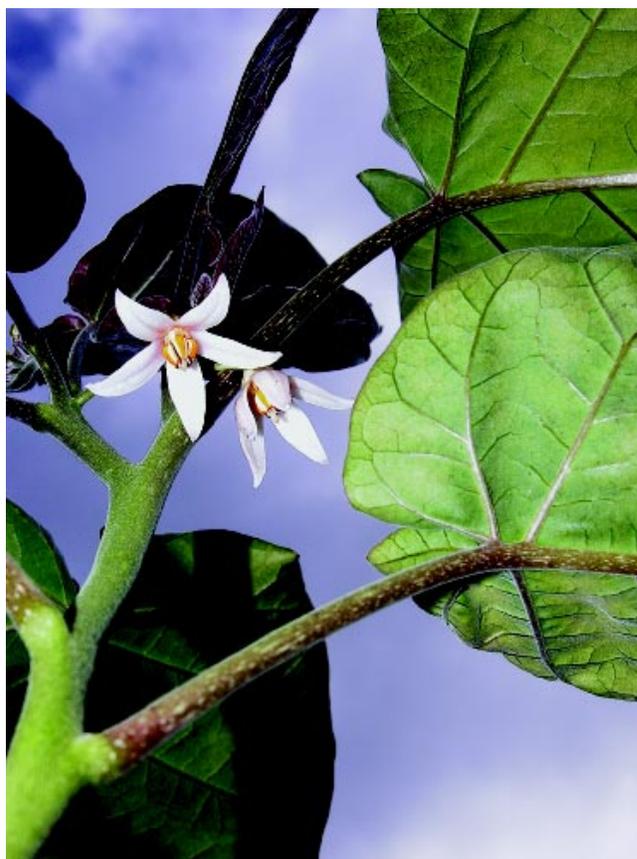
### **Harvesting and yield**

Fruit should be picked with the stem on or cut with a small piece of stem left intact. The tough skin lets pickers place the fruit into bags or directly into boxes. The fruit ripens over a 6–8-week period in Hawai'i, generally from September through May, depending on location and elevation.

Cultivated fields in New Zealand can produce more than 6 tons of fruit per acre. In Hawai'i, a single tree can produce more than 60 pounds of fruit annually.

### **Postharvest quality**

Tree tomatoes can be stored for up to 9 weeks if kept between 37.4 and 40°F with 90–95% relative humidity. The fruit suffers from chilling injury if kept below 37.4°F. Decay occurs if the fruit is stored above 40°F. Peeled fruit can be processed and frozen. It can also be placed into jars with sugar syrup to preserve it for future use; follow the USDA guidelines for preserving.



**Tree tomato flowers**

### **Packaging, pricing, and marketing**

In New Zealand the fruit is packed in egg-type cartons after being graded to size. Small, medium, and large fruits are sold direct to wholesalers, stores, and processors.

In Hawai'i, imported fruits sold individually retailed for as much as \$10.99 per pound. Locally grown fruits sold to groceries in the Kona district are packed three or four per plastic container and have wholesaled for \$5.00 per pound. Big Island hotel and restaurant chefs have purchased 10–20 pounds of fruit, packed in boxes, at a time.

### **Food uses and nutrition**

Tree tomatoes are highly versatile for culinary use. They can be used as a substitute for tomatoes, cut fresh in salads, served sweetened in desserts, or added to spicy sauces. Chutney made with the fruit is highly valued in New Zealand and often found served in place of tomato ketchup. West Hawai'i chefs have developed a number of recipes, curries, and chutneys using the fruit.

**Average degrees Brix**  
8–10 (California data)

**Nutritional value** per 100 g of edible portion\*

Moisture	82.7–87.8
Protein	1.5 g
Carbohydrates	10.3 g
Fat (ether extract)	0.06–1.28 g
Fiber	1.4–4.2 g
Ash	0.61–0.84 g
Calcium	3.9–11.3 mg
Phosphorus (with seeds)	52.5–65.5 mg
(without seeds)	13.1 mg
Iron	0.66–0.94 mg
Carotene	0.371–0.653 mg
(calculated as vitamin A)	540 I.U.
Thiamine	0.038–0.137 mg
Riboflavin	0.035–0.048 mg
Niacin (with seeds)	1.10–1.38 mg
(without seeds)	1.011 mg
Ascorbic acid	23.3–33.9 mg

\*Values compiled from various sources



**Banana-stuffed guava French toast with tree tomato sauce**

## Recipes

### Tree tomato rice

*Teri Wisdom*

Serving size: 6 to 8

2 cups sweet rice, washed and drained  
2 cups white rice, washed and drained  
8 cups water  
3 T vegetable oil  
3 cloves of garlic, crushed  
2 lb chicken, cut into bite-size pieces  
1 medium onion, diced  
3 chopped tree tomatoes  
1 cup chicken broth  
2 medium green bell peppers, sliced into thin strips  
1 T annatto seeds soaked in 1 cup water for 30 minutes  
1 T raisins  
1 tsp salt  
½ tsp pepper  
3 hardboiled eggs

*Procedure*

Cook rice.

Heat oil in large pot, sauté garlic until light brown. Add chicken, and brown.

Add onions and tree tomatoes; cook until onions are soft.

Add the chicken broth, cover, and simmer for 8–10 minutes or until the chicken is tender.

Remove seeds from water and stir in vegetables for the orange color. Be sure to not add the seeds.

Add the cooked rice, raisins, salt, and pepper, and mix well.

Cook 10 minutes more, stirring occasionally to prevent burning.

### Tree tomato sauce

*Chef Paul Heerlein*

6 oz ginger  
4 cups white wine  
36 oz passion orange juice  
1 orange zest  
3 quarts pineapple juice  
2 tsp brown cloves  
1 T allspice  
22 lb tree tomato

*Procedure*

In a saucepan, add white wine and ginger and reduce by half.

Add all remaining items except tree tomato and reduce half-way.

Add tree tomato and reduce to desired consistency.