

**Farm and Forestry
Production and Marketing Profiles:
Highlighting value-added strategies**

Avocado (*Persea americana*)

Citrus (*Citrus* species)

Fig (*Ficus carica*)

‘Ōhelo berry (*Vaccinium reticulatum*)

Rollinia (*Rollinia deliciosa* and *R. mucosa*)

Surinam cherry (*Eugenia uniflora*)

Yam (*Dioscorea* species)

By Craig R. Elevitch and Ken Love

EXAMPLE CROP 1

AVOCADO

(*PERSEA AMERICANA*)

EVALUATING LOCAL PREMIUM VARIETIES

Avocados must have to come to Hawai'i with the first traders. It is estimated that there are currently well over 200 named types in Hawai'i, with wide variation in taste and other fruit qualities. This genetic diversity is a basis for development of specialty varieties with outstanding qualities.

Uses

Avocado fruit is consumed in various ways around the world. In the U.S., it is commonly used in vegetable salads and sandwiches. Guacamole, a Mexican dish made with avocado, lemon, and spices, is also very popular. Some eat avocado sweetened with sugar. In Brazil, avocado is commonly added to ice cream and milk shakes. Oil expelled from the flesh is used as a healthy oil in salad dressings and is also a constituent in cosmetics. Several parts of the plant are used in folk medicine

Agroforestry

The tree casts a dense shade, so its use is limited as an over-story species to shade-tolerant crops. Even so, a few avocado trees are commonly found in coffee orchards in Kona, Hawai'i. The productivity of the fruit for home use or sales outweighs the reduction in area for coffee cultivation. Avocado makes an acceptable component in a multi-row windbreak, where wind damage of fruit is moderated.

Markets

Avocados are commonly available wherever produce is sold.

In Hawai'i, unique as well as commercially selected varieties are available at farmers markets and food retailers.

Adding value

As with all fruit, offering perfect, unblemished fruit is essential for reaching the highest value markets. Selling varieties with unique characteristics such as nutty, rich flesh will attract higher prices. Locally developed varieties can have an advantage in the marketplace, especially for those who prefer to buy locally grown produce. Organic certification may give an advantage in certain markets, such as health food stores, but this advantage may not translate into higher prices. High-quality varieties that fruit off-season may also fetch higher prices.

Description

Avocado trees can reach 18 m (60 ft) or more in height, but trees are pruned to keep them shorter than 6 m (20 ft) for ease of harvesting. Avocado is the only important fruit in the laurel family (*Lauraceae*). There are three races, West Indian, Mexican, and Guatemalan, each with distinct fruit characteristics. Commercial varieties have been selected from each of these three races, as well as from hybrids between them. Most marketed fruit come from the hundreds of these natural occurring hybrids grown throughout Hawai'i.

Environment

Each race has different environmental tolerances, with the West Indian race more tropical (heat tolerant and cold sensitive) and the Mexican and Guatemalan races are more subtropical (more heat sensitive and cold tolerant). The tree requires well drained soils and waterlogging for more than a day can be fatal. Although drought tolerant, continual soil moisture is required for good fruit production. Fruit set is poor in extended wet periods, due to anthracnose.



Left: Coffee agroforest in Kona Hawai'i with avocado, lychee, banana, and mango. Right: In appropriate environments, avocado is an abundant producer.



Left: Kona, Hawai'i farmer Ed Kaneko displays fruit from a superior tree that he selected. Top right: Display of named varieties at farm festival in Kona, Hawai'i. Bottom right: Consumer taste test of four avocado varieties conducted by the University of Hawai'i.

EXAMPLE CROP 2

CITRUS (*CITRUS SPECIES*)

NEW LIFE FOR LOCALLY SUPERIOR VARIETIES

With numerous species and varieties of citrus planted throughout the Pacific, there are many opportunities to develop locally superior varieties. A good example is the Rangpur lime, which became naturalized in Kona, Hawai'i, and developed into a new recognized variety called "Kona" lime. With a unique flavor profile and unusual orange color, Kona lime is an excellent example of a specialty crop developed from a locally adapted variety of citrus.

Citrus species commonly found in the Pacific.

Species	common name	Size and spines
<i>C. aurantifolia</i>	lime	shrub/small tree to 4 m (13 ft), spiny
<i>C. aurantium</i>	sour orange	tree to 10 m (33 ft), short spines
<i>C. grandis</i>	pummelo	tree to 12 m (40 ft), spiny
<i>C. hystrix</i>	Kaffir lime	tree to 5 m (16 ft), short spines
<i>C. limon</i>	lemon	tree to 6 m (20 ft), stout spines
<i>C. macroptera</i>	wild orange	tree to 5 m (16 ft), spiny
<i>C. medica</i>	citron	shrub to 3 m (10 ft)
<i>C. mitis</i>	calamondin	tree to 12 m (40 ft), spiny
<i>C. paradisi</i>	grapefruit	tree to 15 m (50 ft)
<i>C. reticulata</i>	mandarin	tree to 9 m (30 ft), usually spiny
<i>C. sinensis</i>	sweet orange	tree to 12 m (40 ft), often spiny

Uses

All *Citrus* species are important for their fruit, which is eaten fresh or processed in numerous ways in cooked dishes, sauces, and beverages. The fruit is preserved in many forms including marmalade, jam, or candied. The pulp and other by-products from juice production are used as cattle feed. An industrial extract of grapefruit seeds and pulp is used to produce a potent topical anti-bacterial and fungicidal agent. Citrus is one of the most important honeybee forage plants in many parts of the world. Oils in the peel, leaf, and flower are used in cosmetics and as medicinals. Citrus species are important in traditional Pacific Island medicine.

Agroforestry

Citrus trees can be grown together with shade-tolerant crops such as coffee and vanilla with appropriate spacing to avoid over-shading. Citrus trees are very common in mixed perennial gardens around homes, where three to four species are often found for fruit, juice, flavorings, and as ornamentals. Thorny types may be useful for living fences, especially when trimmed as dense hedges.

Markets

Markets are found in all areas for fresh fruit. For unique varieties, farmers markets and restaurants may be most lucrative. For example, a specialty market for the orange-fleshed Rangpur "Kona" Lime (*Citrus* × *limonia* Osbeck) has recently been developed in Kona, Hawai'i among chefs. Citrus preserves are commonly found in farmers markets, grocery stores and in gift shops. Citrus trees loaded with bright color fruit are an essential component of agtourism or "you pick" destinations.



Left: Calamondin is grown throughout the Pacific and used for juice and preserves. Right: Sheep grazing to maintain ground cover in a citrus orchard in Queensland, Australia.



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Top left: Unique tasting or looking fruit can give a marketing edge. Bottom left: Kumquat marmalade with an informative label. Right: Kona lime juice has a refreshing taste and unique color for lime.

Adding value

Proper tree pruning can increase percentage of perfect fruit. Most citrus can be stored from 2 to 4°C (36–39°F) for up to 5 months. Building a regional identity for a unique variety, such as Rangpur “Kona” Lime, can add value by increasing recognition and therefore demand. Knowing the stories behind the different citrus types and varieties will help increase sales at farmers markets. For example, people appreciate the story of how pummelo was used by the Chinese as currency when trading with India in the 1400s.

Description

Citrus are shrubs to medium-size trees up to about 6 m (20 ft) in height, although some species can reach 15 m (50 ft). Rootstocks can greatly affect the height of grafted trees. Trees have thin, smooth, and gray-brown to greenish bark. Most species are single-trunked with very hard wood. Canopy widths range from slender to broad, depending on species. Many cultivated species are pruned so that the canopy is as wide as the tree is tall.

Environment

Suitable climates for citrus are the tropical and subtropical humid regions of the world. In the subtropics, citrus grows between sea level and 750 m (2450 ft) above sea level. In the tropics, citrus does well below 1600 m (5250 ft). Mean annual rainfall is 900–3000 mm (35–120 in). Without irrigation, 900 mm (35 in) per annum is typically needed for any significant fruit production. Optimum daytime temperatures are 25–30°C (77–86°F), but temperatures can reach 43°C (110°F) in Southern California and other citrus-growing regions. Citrus tolerates a wide range of soils, from almost pure sands to organic mucks to heavy clay soils (Rieger 2002). The trees do not stand waterlogged soils but grow well in freely draining soils.

Further information

For information on culture, pests and diseases, and yield, see Manner et al. (2006). For market and cost of production info, see Love 2007 (Rangpur and Kumquat).

EXAMPLE CROP 3

FIG (*FICUS CARICA*)

VARIETY TRIALS

Believed to be indigenous to Asia Minor, the fig spread beyond the Mediterranean region before recorded history. Hiram Bingham first reported the fig in Hawai'i in 1825. There are about 1,000 varieties of figs worldwide, which are usually described by their size, fruit color, and leaf shape. The most common types found in Hawai'i are Brown Turkey and White Kadota. Currently, field trials are underway to select additional varieties with unique color, flavor, and texture in Hawai'i. The best of these varieties will become high-value specialty figs for the local fresh market.

Uses

Figs are generally consumed fresh, peeled or unpeeled. Fresh fruit is also used in many cooked dishes such as cakes and pies, pudding, and bread. Figs are also preserved in various ways such as dehydration, jam, and as whole fruits in sugar syrup. Off-grade figs have been roasted and used as a coffee substitute or fermented to produce alcohol. Figs are high in fiber that is good for lowering blood pressure and controlling cholesterol. Being high in fiber they also give a feeling of fullness, which can be useful for weight-loss diets. Figs are a good source of potassium and vitamin B₆. Fruit, leaves, and latex have been used in various folk remedies in Latin America.

Markets

The most promising markets in the Pacific are for fresh fruit sold in farmers markets, grocery stores, and restaurants. The most lucrative markets for newly introduced varieties with exceptional color and taste may be in the visitor industry, i.e., hotel restaurants and visitor gift boxes. Catering to chefs may also be a specialty market, as they often have special requests (such as for 80% ripe fruit), which can be filled as a unique product.

Adding value

Figs lend themselves to a wide variety of value added products as noted under "Uses" above. Unblemished and optimally ripened figs have the highest value. This requires regular picking, preferably daily. Figs are fragile and should be placed in containers at the time of harvest so that they do not touch each other. Latex from the stem end should not be allowed to touch the fruit skin, as it will cause discoloration. Fully ripe figs are very perishable and should be chilled as soon as possible after harvest at $-1-0^{\circ}\text{C}$ ($30-32^{\circ}\text{F}$) degrees and 90–95% relative humidity for storage up to 30 days. Protection from birds by bagging fruit or netting the tree is essential to ensure unblemished fruit. Fruit fly traps may aid in reducing fruit fly damage where problematic. Matching variety to elevation and other environmental conditions is important to ensure reliable and high yields, in addition to fruit quality.

Description

In Hawai'i the tree grows rapidly and can achieve heights of 9 m (30 ft) or more. In many growing regions, figs are pruned severely after harvest to stimulate new growth for fruit production and to facilitate harvesting. Fig belongs to



Left: A well pruned tree with shiny objects placed to scare away birds. Right: Bagging fruit helps protect from bird and rodent damage.



Top left: Well displayed certified organic figs for sale a farmers market. Top right: High quality perfect fruit for high-end fresh market. Bottom left: Whole figs preserved in balsamic vinegar. Bottom right: Specialty fruit and nut cake based on fig.

the Moraceae family, which includes breadfruit (*Artocarpus altilis*), jackfruit (*Artocarpus heterophyllus*), and mulberry (*Morus* spp.).

Environment

Some types of figs are cultivated from sea level to over 1,500 m (5,000 ft) and can be grown in many microclimates.

The trees can grow in most soils with good drainage. They are tolerant of some salinity but do not like highly acidic soils. Figs are drought tolerant.

Further information

For information on fig culture, pests and diseases, yield, and cost of production, see Love (2007)

EXAMPLE CROP 4

‘ŌHELO BERRY (*VACCINIUM RETICULATUM*)

NATIVE PLANT DOMESTICATION AND VARIETY SELECTION

‘Ōhelo berry, native only to Hawai‘i, has not been domesticated until recently. A project undertaken by the USDA has developed types both for berry production and for ornamental use. As a native plant, ‘ōhelo berry has unique appeal to chefs and others who are always looking for specialty ingredients with a Hawaiian character.

Uses

‘Ōhelo berry is a small native Hawaiian shrub related to cranberry and blueberry. It is endemic to Hawai‘i, i.e., found nowhere else in the world. (Now being introduced to Oregon) The cranberry-like fruit is used primarily to make jam and jelly, but is also used in various dishes and baked goods. New markets for ‘ōhelo as an indigenous ornamental plant are also being developed.

Agroforestry

Because ‘ōhelo berry has only recently been brought into cultivation, there are no examples of integrating the plant in agroforestry systems. However, due to its natural tendency to colonize disturbed or exposed drier lava sites, it has potential to be grown as an understory crop in an open orchard on such sites.

Markets

‘Ōhelo berry is usually processed into jam or jelly and sold in farmers markets and grocery stores throughout Hawai‘i. One market is in higher-end restaurants who aspire to diversify their offerings by incorporating uniquely Hawaiian ingredients. The fruit is used both as a sweet and a savory at these restaurants.

Adding value

‘Ōhelo is sold unprocessed to hotel chefs and jelly makers, and is usually sold as preserves on the retail market. A wide range of products incorporating this fruit can be envisaged: sauces, flavorings, and fruit mixes. Its status as the only endemic Hawaiian fruit that is commercially used imparts a unique identity, which adds significantly to its value compared with similar exotic fruits.

Description

The small shrub reaches 10–130 cm (4–50 in) in height. Berries vary widely in color from yellow to red to dull black (Wagner and Herbst 1990).

Environment

‘Ōhelo berry is commonly found at 640–3,700 m (2,100–12,000 ft) on Maui and Hawai‘i islands, but also grows on Kaua‘i, O‘ahu, and Moloka‘i. It usually grows as a pioneer on exposed lava flows, such as alpine or subalpine shrubland (Wagner and Herbst 1990). When in season, Hawai‘i residents gathered ‘ōhelo berries from the National Parks and high elevations to process into jam, jelly and pie filling. Potential negative impacts of wild gathering activities may include spreading of invasive weed species, and competing for berries with the endemic nene goose (*Banta sandvicensis*).



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Left: Beautiful flowers of ‘ōhelo berry. Middle: ‘Ōhelo berry shrub with ripe fruit. Right: The beautiful foliage of ‘ōhelo berry lends itself to growing this plant both for fruit and ornamental purposes.



Top left: A 6-year-old domesticated 'ohelo seedling at the Volcano field plot. Bottom left: The original 'Kilauea' selected in 2006. Right: Tissue culture plants of 'Kilauea'.

EXAMPLE CROP 5

ROLLINIA

(*ROLLINIA DELICIOSA* AND *R. MUCOSA*)

INTRODUCING A NEW TROPICAL FRUIT

Thought to have originated in Northern Brazil along the banks of the Amazon, rollinia is now found growing in all tropical locations and rapidly becoming a favorite with tropical fruit aficionados. By introducing this unusual looking fruit to consumers, it has good potential to become a popular specialty fruit in new markets.

Uses

The fruit, often described as having a caramel, lemon custard pudding flavor, is usually eaten out of hand. Rollinia fruit can also be made into sauces, ice cream, flan and other dessert dishes. It is often juiced in Brazil and sometimes blended with milk for a drink. It has also been made into wine. The wood is hard and used in canoes, boat masts, and other durable uses.

Agroforestry

In favorable environments, rollinia grows quickly and can bear fruit within 2–3 years of planting from seed or grafting. This makes it a good candidate for early yields in a multispecies planting with other fruits and nuts that take longer to begin production. Appropriately pruned to maintain canopy size (and facilitate ease of harvesting), the tree can make a good companion to shade-tolerant understory crops.

Markets

Farmers markets and health food stores are primary mar-

kets. This fruit is rapidly gaining favor with chefs and larger groceries featuring locally grown produce for the adventurous consumer.

Adding value

Commercial fruit is generally harvested mature and beginning to ripen, when it starts to soften and turn yellow. Care in handling is highly recommended, as the fruit protuberances and skin will blacken considerably when touched.

Description

The fast growing tropical tree can reach heights of 15 m (50 ft). Under ideal conditions, the tree can fruit as early as 2.5 years from the time a seed is planted. The fruit is highly inconsistent in shape and size. It turns from green to yellow when ripe. The milky white flesh usually contains black seeds averaging a 1.2 cm (0.5 in) in length. Some seedlings will produce fruit in 2–3 years while others will produce in 5–6 years. In many parts of Hawai'i, fruiting occurs year around when rainfall is abundant. Rollinia is in the Annonaceae family, which includes other popular fruits such as cherimoya, sugar apple, and soursop.

Environment

Rollinia prefers hot, humid climates. The tree thrives where rainfall is evenly distributed throughout the year. It does not tolerate cold or extended drought. It prefers deep, rich, well drained organic soil and benefits from copious amounts of mulch. Rollinia tolerates poorer and highly acidic soils as long as there is sufficient water. In Hawai'i, trees can be found from sea level to 900 m (3,000 ft).

Further information

For information about culture, pests and diseases, yield, and cost of production, see Love and Paull (2011).



Left: Rollinia fruit on tree. Right: The fruit protuberances blacken when handled, reducing consumer appeal.

EXAMPLE CROP 6

SURINAM CHERRY (*EUGENIA UNIFLORA*)

CHEF-DRIVEN DEMAND

Surinam cherry is a juicy, sweet-tart fruit generally considered “kid’s food” for picking and eating out-of-hand. In Hawai’i tasting trials of unusual fruits several years ago, chefs were attracted to the strong, resinous flavors Surinam cherry and began developing unusual dishes highlighting it. By developing a market among chefs over a few years, Surinam cherry has increased in price from \$1.25/lb to \$6.50/lb.

Uses

Surinam cherry fruits are usually eaten out-of-hand, but are also often processed into jam, jelly, and relish. The fruit can also be pickled and the juice is fermented in wine or vinegar. Some chefs use the fruit as a base for exotic curry. Whole fruit or pieces can be used in pie, pudding, salad, and ice cream. The leaves contain a pungent oil that repels insects. Infused or decocted leaves have several medicinal uses.

Agroforestry

The tree can produce fruit well even in partial shade, and due to its small stature, it makes a good understory tree. Surinam cherry is also planted in hedges, which, when regularly pruned, can become dense and serve as living fences or boundary barriers in edible landscaping.

Markets

Surinam cherry sold as fresh fruit is generally harvested when fully ripe as the fruit contains more sugar and less resin. The fruit is edible, somewhat firmer and less susceptible to damage, when the color is orange or orange-red, but has a more resinous flavor. Fruit harvested for processing can be picked as soon as it becomes orange. Chefs and jelly manufacturing companies have expressed a desire for fruit at this stage.

Adding value

Due to the quick degradation of the fruit at ambient temperatures, the faster it can move from field to refrigeration, the longer its shelf life. Fresh fruit packaged for the consumer should be in vented clamshell containers with no more than a double layer of fruit. Packed fruit should be even colored and inspected carefully for defects and possible infestation. Fruit that leaks juice should be discarded or kept for processing. Fruit harvested for sale to processors should be washed. Freshly picked Surinam cherry chilled within an hour of harvest can maintain its integrity in the produce section of a supermarket for up to 14 days.

Description

Surinam cherry is a large shrub that can achieve heights in excess of 8 m (25 ft), although due to its slow growth it can take decades to reach this height. It is often referred to as a tree. A member of the Myrtaceae family, the plant is related to guava, jaboticaba, mountain apple and other members of the genus *Eugenia*, which includes many edible species. There are two distinct variations found in Surinam cherry, a common red colored fruit and a less resinous dark purple to black, often sweeter fruit. It produces fruit in full sun or partial shade.

Environment

The Surinam cherry is a tropical that can be grown in tropical or sub-tropical regions. It can be grown at sea level up to 1,500 m (5,000 ft) in elevation. The plant has a long taproot and can survive periods of drought. The plant thrives in most soils but produces more fruit in deep loamy soil. It is intolerant of saline conditions.

Further information

For information on Suriname cherry culture, pests and diseases, yield, and cost of production, see Love (2007).



Top: Surinam cherry fruits on tree. Bottom: Enjoying a fresh, ripe fruit out-of-hand.

EXAMPLE CROP 7

YAM

(*DIOSCOREA ALATA*, *D. ESCULENTA*, *D. BULBIFERA* AND *D. NUMMULARIA*)

A PROMISING TRADITIONAL STARCH CROP

Yam is one of the most important staple crops of the Pacific and ranks among the top root crops in the tropics along with cassava (*Manihot esculenta*) and taros (*Colocasia* and *Xanthosoma* species). It has high potential for Pacific Islander markets as well as certain niche markets in other cuisine, such as in Japan, where certain varieties are highly valued.

Uses

Yams (*Dioscorea* spp.) are largely seasonal crops primarily cultivated for their edible tubers, which are consumed as a staple food. Although the most important species, such as the greater yam (*D. alata*), lesser or sweet yam (*D. esculenta*), and the thorny or wild yam (*D. nummularia*) produce large underground tubers, some species, such as the air yam (*D. bulbifera*) produce edible bulbils or aerial tuber-like structures that form on the above-ground stems. Most species and cultivars must be cooked by boiling, frying, or roasting prior to consumption to denature toxic alkaloids. In addition to consumption as a starchy carbohydrate in dishes, yam can also be processed into flakes or flour for storage and use in food preparation. Purple-fleshed varieties are used in ice cream and confectioneries. Yam tuber also makes suitable poultry and livestock feed. Parts of the plant are used



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Left: Yam trellised onto a log leading to the canopy of a breadfruit tree in a Samoan agroforest that includes poumuli (*Flueggea flexuosa*), banana, and coconut. Right: Newly harvested yam in Tongan agroforest of giant taro (*Alocasia macrorrhiza*), and coconut.

in various folk remedies. The tubers are of great ceremonial significance in many areas of the Pacific, such as Papua New Guinea, Vanuatu, Fiji, Tonga and Pohnpei, where they are considered the most chiefly staple food. Because of their seasonal nature, yams are often the central focus of the traditional calendar, with the equivalent terms for year in Fiji and Tonga, *yabaki* and *ta'u*, being the names for the annual yam harvest in both countries.

Agroforestry

Yams are often grown within agroforestry systems throughout the Pacific. Yams generally have a 7–9 month growth cycle, at the end of which the vines die back and the tubers are harvested. Yam plants are commonly started in deep holes under raised mounds of well-worked, friable soil. They are also normally grown onto trellis made of tree branches, bamboo or other material and some varieties, particularly the thorny yam (*D. nummularia*), are often trellised onto trees such as breadfruit, using a long pole to guide the emerging yam shoots into the canopy. Because the vine dies back after a few months, it does not significantly reduce the vigor of the tree it is trellised into by shading.

Yams are very commonly interplanted with other staple food plants, supplementary food crops and a range of food trees and other multipurpose trees, many of which are pollarded or coppiced, but not killed to allow for regeneration. Yams, which require high quality soils, are normally the first crop in the succession of a shifting agricultural garden, which after harvesting are succeeded by taro, sweetpotato, or cassava before a plot of land is allowed to revert to fallow. In Tonga, yam is often planted in large intercropped communal gardens known as *toutu'u 'ufi*, where a landowner will allow a large number of farmers to use the land for planting yams, to be followed by other crops. The most common crop combinations in these *toutu'u* are a number of greater yam cultivars (*'ufi*), interplanted with taro (*talo tonga*, *Colocasia esculenta*), giant taro (*kape*, *Alocasia macrorrhiza*) and the Pacific plantain (*hopa*, *Musa* AAB group). The entire garden is normally planted within an existing coconut plantation with other scattered useful trees. Sweet yam (*'ufilei*), hibiscus spinach (*Abelmoschus manihot*) and pandanus are often planted along the borders.

Because yams require good soils and due to anthracnose wilt, the rose beetle and other diseases, yams, as suggested above are normally the first in the planting sequence and only occasionally planted two or more years in succession on the same plot of land.

Markets

Local farmers markets, retail stores, and restaurants are the primary markets, although an increasing amount of yam is exported to New Zealand from Tonga and Fiji, often through family networks. Markets may be developed for yam starch, flour, or flakes to be used in special diets. For example, starch grains of *D. esculenta* are particularly small, making them more easily digestible by people with digestive disorders.

Adding value

Avoiding mechanical damage when harvesting, handling, and transporting is important, as yam is susceptible to bruising, which limits longevity of tubers in storage and reduces the value of fresh product in the marketplace.

Description

Yams are perennial vines that are usually grown as annuals for their edible tubers and bulbils. The characteristically spiraling, winged or ridged stems, which can grow to 2–12 m long, typically twine and climb on other vegetation during the growing season. The strongly veined leaves are usually heart shaped. Tubers vary widely in size depending on species and variety. *D. alata* tubers range from cylindrical and up to 1.5 m in length, to stout, fingered or lobed. The flesh is white, cream, or purple.

Environment

Yam grows in tropical to warm temperate, frost-free climates. It prefers well-distributed rainfall of 1,500 mm. Although drought tolerant, even soil moisture is required for good tuber production. Optimum average temperatures during the growing season are 25–30°C. Yam does not tolerate water logged soils and thrives best in well-drained, fertile soil rich in organic matter.

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Specialty Crops for Pacific Island Agroforestry (<http://agroforestry.net/scps>)

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