

'Ulu

Use this information to help verify student knowledge and answer student questions during the 'Ulu Discussion in the Lesson Introduction. See the 'Ulu Mo'olelo Sign for a story about the cultural significance of 'ulu.



Q: Is 'ulu an important food plant in the Pacific?

A: Yes. 'Ulu has long been an important staple food in the Pacific where hundreds of named varieties have been cultivated. Breadfruit is one of the highest-yielding food plants, with a single tree producing up to 200 or more fruits per season. The world's largest collection of breadfruit varieties (over 120 varieties) exists outside of Hana, Maui and was established by Diane Ragone from over 20 years of travel in the Pacific. The collection is managed by The Breadfruit Institute (at the National Tropical Botanical Garden), which was founded in 2003. Today, breadfruit is grown in close to 90 countries around the world. This "tree of bread" has the potential to play a significant role in alleviating hunger in the tropics.

Q: When and where did 'ulu originate?

A: This crop was first domesticated over 3,000 years ago in the western Pacific.

Q: When did 'ulu arrive in Hawai'i?

A: One species (*Artocarpus altilis*, the common seedless 'ulu) was brought to Hawai'i from the Society Islands in the late 1300s or earlier. Other varieties were introduced to Hawai'i from Samoa, Tonga, the Society Islands, and Micronesia during the late 1800s and throughout the 20th century.

Q: What cultural significance does this plant have in Hawai'i?

A: A number of Hawaiian legends exist about the origin of the 'ulu tree. One of these relates that the god Kū bid farewell to his earthly wife during a famine and disappeared into the ground. From there a breadfruit tree grew, providing fruit for his wife and child. Upright breadfruit trees were viewed as kinolau (one of the many forms taken by a supernatural body such as a Hawaiian god or goddess) of Kū, one of the four major Hawaiian gods. The "bushlike" or so-called female breadfruit plants were closely associated with the goddess Haumea, mother of Kū and patron of childbirth. Breadfruit is also sacred to Kāne, the Hawaiian deity responsible for introducing cultivated plants to humans.

Q: How are 'ulu trees propagated?

A: 'Ulu is typically propagated vegetatively using root shoots or rarely, root cuttings. (Vegetative propagation is reproduction through asexual means, i.e. not from seed, either naturally through budding, rhizomes, runners, bulbs, etc., or artificially through grafting, layering, or taking cuttings.) Other methods of 'ulu propagation include air layering, grafting, and infrequently, seed propagation. The Breadfruit Institute has developed micro-propagation methods for breadfruit which makes it possible to produce large quantities of healthy, vigorous plants that tend to become compact, low-branching trees. In general, 'ulu grown from seed will fruit in 5 to 10 years or longer, while plants grown from root shoots produce fruit in 3 to 5 years. Micro-propagated plants can begin bearing as soon as 2 to 3 years.

Q: Do 'ulu trees have a beneficial impact on the natural environment?

A: Yes. 'Ulu trees create a lush canopy that shelters a wide range of cultivated and native plants. In the Pacific, the trees are often grown on steep hillsides, protecting the soil from erosion. 'Ulu trees create organic mulch, shade, and a cooler microclimate beneath the canopy. They give shelter and food to important pollinators and seed dispersers such as honeybees, birds, and fruit bats. Bees are attracted to and harvest droplets of latex from the surface of the fruit as well as pollen. However, pollination is not required for fruits to develop.

Q: How do you plant an 'ulu tree?

A: 'Ulu trees prefer light or medium, well drained soils. Plant the tree in full sun or partial shade, preferably at the onset of the rainy season. If the weather is dry, water as needed for the first 3 to 6 months of establishment. Before planting, carefully trim the lower leaves reducing their size by 1/2 to 2/3. Do not remove or damage the growing tip where new leaves develop. Dig a hole the same depth of the container and twice as wide as the container. Add about 1 cup of vermicast to the bottom of the hole and mix it with soil. Carefully remove the tree

from the pot. Place the tree in the hole, add soil no higher than the level of the plant in the pot, top dress with compost, and water well. Place a layer of mulch around the tree, 4 to 6 inches deep and kept away from the trunk to avoid rotting. Mulching young plants is beneficial for helping keep the soil moist, adding a steady supply of nutrients, and controlling weeds around the root system. Do not use herbicides or pesticides on or near the tree or any school gardens.

Q: What kind of care does an 'ulu tree need?

A: 'Ulu is a relatively trouble-free plant to grow. It is best to remove and compost any damaged fruit that has fallen to the ground in order to discourage fruit flies. Keep the tree mulched (e.g., with wood chips) in order to preserve soil moisture and prevent damage to the roots from lawn mowers and other equipment. Feed the tree (e.g., with composted chicken manure placed on the soil and covered with mulch) at the beginning and end of the fruiting season to help maintain health and vigor. Remove any dead and damaged branches from the tree and ground. Have the tree pruned once a year after the fruiting season.

Q: When and how is the fruit harvested?

A: Different varieties of 'ulu have different fruiting seasons. However, in Hawai'i, the fruits are generally most abundant from July to February. Fruits are generally picked when firm and mature but not yet ripe. The skin will be greenish-yellow with slight brown cracking or crusting and a few splotches of dried sap. The flesh will be firm and creamy white or pale yellow in color. (Immature fruits are bright green and bleed the sticky white sap when cut; the flesh is pale green beneath the skin). Cut or twist the stem of the fruit (hua) to snap it from the branch. Use a picking pole (e.g., sharp scythe attached to a sturdy pole with a basket or net attached for catching) for fruits that are higher off the ground. Turn the fruit upside down to let the sap drain from the end of the stem. Immature and mature fruit will soften within 1 to 3 days after harvest. Fallen fruits will soften sooner.

Q: How are 'ulu prepared for eating?

A: 'Ulu is a very versatile food and is prepared and eaten at all stages of development. 'Ulu can easily substitute for starchy root crops, pasta, potatoes, or rice. Small, immature fruit can be boiled, pickled or marinated, and has a flavor similar to that of artichoke hearts. The mature fruit is similar to a potato and can

be baked, steamed, boiled, fried, grilled, barbecued, and more. Soft ripe fruit are sweet and can be eaten raw or used to make smoothies, pies, cakes, and other desserts and sweets. The possibilities for breadfruit are endless! Use it to prepare tasty appetizers, salads, soups, stews, casseroles, main dishes, breads, desserts, and much more. Breadfruit can also be dried and ground into gluten-free flour. The nutritious seeds resemble chestnuts in flavor and texture. They are boiled, roasted, or ground into meal. Even the male flowers can be eaten as a sweet when candied.

Q: Why is 'ulu called breadfruit?

A: The cooked fruit has a texture, fragrance, flavor, and nutritional makeup (carbohydrates and fiber) similar to fresh-baked bread. Similar to bread, which is a dietary staple in many regions around the world, breadfruit is a dietary staple in the Pacific, Caribbean and other tropical regions.

Q: What are the nutritional benefits of eating 'ulu?

A: The fruit is high in complex carbohydrates and a good source of dietary fiber, calcium, copper, iron, magnesium, potassium, thiamine, and niacin. Some breadfruit varieties are also good sources of antioxidants and carotenoids.

Q: Are there other uses for 'ulu besides food?

A: Yes. All parts of the tree are used. A breadfruit tree yields food, construction materials, medicine, cordage, glue, insect repellent, and animal feed. The wood is light and durable and is used in the construction of houses, furniture, and canoes and carved into attractive bowls, statues, handicrafts, and other items. The sticky white sap has been used for glue, caulk, and even chewing gum. The inner bark, or bast, can be made into bark cloth or cordage. The leaves are used as fans, to wrap foods that are cooked in traditional earth ovens, and as biodegradable plates. 'Ulu leaves, petioles, bark, and latex (sap) are all used medicinally.

Q: What is the scientific name for 'ulu?

A: *Artocarpus altilis*. Breadfruit is a member of the Moraceae (fig) family.

