

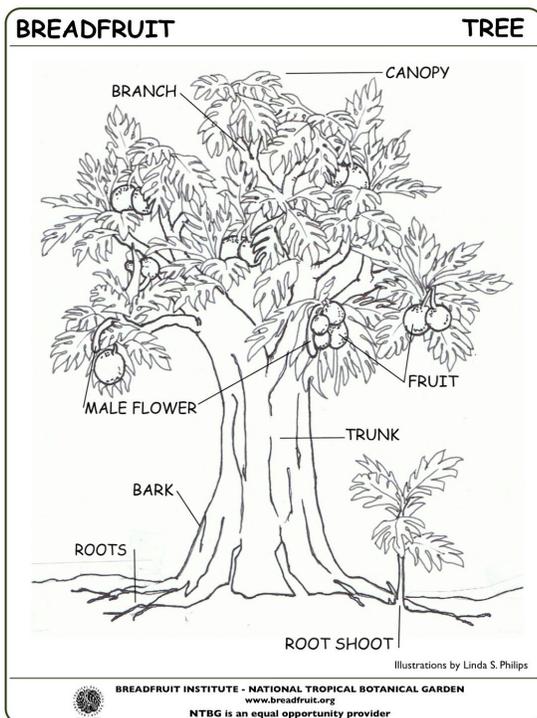
## How to Grow a Complete Diet with Permaculture Principles: Tropical Subsistence Gardening. 24 part class series



### Part 11 of 24 **Staple Tree Crops (carbs): Breadfruit/Ulu:**

**Acknowledgements:** A special thanks to Hawaiian Sanctuary, County of Hawaii Research and Development and all others involved to make these classes a reality! We are still looking for support to complete and enhance this amazing FREE program. <http://hawaiiansanctuary.com/donate>

**Introduction:** Staple crops are eaten frequently and make up the base of our diet supplying a large percentage of our energy and nutrient needs. Breadfruit or “ulu” in Hawaiian was one of the crops the polynesians brought with them to Hawaii known as a “canoe crop”. Cooked and eaten once mature but still firm they are like a potato and can be used in recipes as such. When fully ripe they turn sweet but most kinds must still be cooked.



**Anatomy of a ulu tree:** Ulu are generally large trees that can reach 60 + feet tall and 40 ft wide. The wood is soft and strong and the trees are fairly open. Pruning is important to keep the trees harvestable. Trees that are kept at 20-25 feet are easy to harvest with an extendable pole picker or pruning saw. Ulu grows best under 2100 ft.

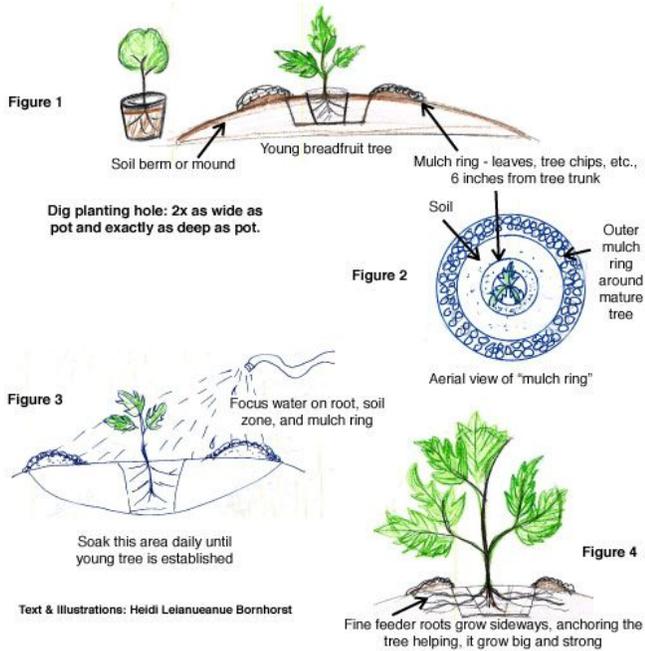
**Ulu Varieties:** There are over 100 named varieties of ulu worldwide, and around 20 or so on the island. Maafala is a very productive and compact spreading variety that has recently gained popularity. Maafala also has a multiple fruiting seasons per year so the harvest is spread out. “Hawaiian” is the original variety on the island and has a shorter bearing season and the trees get taller faster and require more pruning to keep harvestable. Other Varieties available on the island include, Otea, PiiPii, apuaa, ulu fiti, dug dug, samoan, and many more.

**Niche in a Food Forest:** Ulu is part of the overstory. They cast moderately dense shade but many other plants can be grown under or nearby them. They can handle some climbing vines like uhi, which will grow vigorously but then die back. Vanilla, black pepper and cultivated air potato are also suitable climbing

edible vines that can climb the ulu tree like a trellis without usually harming it. Pigeon pea and or crotalaria are nitrogen fixing shrubs are good companions as they can be cut for mulching the young tree and can protect young trees from wind. Taro and olena and many other crops can be grown around around the tree as well.

**Propagation:** Many varieties of ulu are seedless though some types do have a few to several seeds. Seeded varieties are not “true to seed” so propagation is usually done vegetatively. Seedless varieties are propagated through division of the root shoots, by sections of root, by air layering, and occasionally by grafting. Root shoots are usually the easiest way to propagate. Ideally root shoots are slowly separated from the mother tree by partially cutting through the root on each side of the shoot. Then after several weeks or months fully cutting through the roots and waiting again for the root shoot to grow its own roots, then digging it up and putting it in a pot in a shaded nursery for several months keeping well watered. Harden off and plant out.

## BREADFRUIT TREE PLANTING GUIDELINES



*Plant a Tree of Life - Grow 'Ulu is supported by a grant from the Ceres Trust*



The Ho'oulu ka 'Ulu project of the Breadfruit Institute of the National Tropical Botanical Garden and the Hawaii Homegrown Food Network aims to revitalize 'ulu (breadfruit) as an attractive, delicious, nutritious, abundant, affordable, and culturally appropriate food which addresses Hawaii's food security issues.

[www.breadfruit.org](http://www.breadfruit.org)

HAWAII HOMEGROWN FOOD NETWORK

[www.breadfruit.info](http://www.breadfruit.info)



**Planting:** Keiki should be planted at least 30-40 ft apart, in holes 1-2 feet deep and wide, and mulched with a doughnut shape, good drainage is important. Amendments can be mixed with the soil. Fill the planting hole with water if does not drain in a few minutes, black cinder or sand should be added to the existing soil so that it drains. Trees should be planted at the same depth as the soil in the pot. Halved coconuts may be buried at the bottom the planting hole to retain moisture, especially in dry areas. A cup or two of 4-3-2 fertilizer may be spread around the tree after planting.

**Cultivation:** Keep well mulched when young. Prefers some shelter from wind. Can drop fruit prematurely during drought.

**Pruning:** Often kept pruned to 20-25 ft for ease of harvest. Best pruned after finished fruiting. Use pruning seal on large cuts to prevent rot.

**Ulu Diseases / Pest Control:** Ulu has few serious diseases and pests here in hawaii.

**Harvest:** When ulu fruit is mature and ready to harvest it has several indicators: it starts to **drip white latex**, becomes **more yellowish in color**, may get **brown splotches**, **tiles on skin widen**. Immature fruit will not be starchy when cooked and most of the

stories about breadfruit being a poor food crop are due to people unknowingly eating immature fruit.

**Usage:** Mature ulu still hard can be cooked and used like a potato, boiled, baked, mashed, fried, etc. The simplest way to cook them is to wash, cut into wedges, and steam with the peel still on. As ulu ripens it becomes softer and sweeter. When it is ripe and soft can be made into pancakes.

**Storage and preservation:** Ulu ripening can be halted by storing in the refrigerator for up to a week so that they do not ripen and can continue to be cooked green. Unripe mature fruit can be frozen, or cooked, peeled, dried and ground into flour.

**Nutritional Data:** Breadfruit, baked *Artocarpus atilis* per 100g - Calories 103.0 - **Carbs 22.1g** - Protein 1.3g - Fat 0.6g - Vit. A 2.0mg - Vit.C 22.0mg - Calcium 18.0mg - Iron 0.3mg - Zinc 0.1mg

### Further Reading:

Breadfruit Project [http://www.uq.edu.au/School\\_Science\\_Lessons/BrProj.html#BrProjHEADING](http://www.uq.edu.au/School_Science_Lessons/BrProj.html#BrProjHEADING)

Breadfruit Species Profile [http://agroforestry.org/images/pdfs/Breadfruit\\_specialty\\_crop.pdf](http://agroforestry.org/images/pdfs/Breadfruit_specialty_crop.pdf)

Breadfruit Institute fact sheets & searchable database <http://ntbg.org/breadfruit/resources/display/cat/5/>

**Homework:** Mulch, prune or propagate ulu. If you can find a mature breadfruit cook it up.

**Next Class April 6th Part 12. Staple Root Crops (carbs): Cassava, Taro, Sweet Potato & Uhi:**

Learn everything you need to know to grow these 4 important root crops for Hawaii. Cassava is underutilized here and extremely drought resistant.

**Contact: Malama Aina Permaculture: Edible Landscape Design, Education & Nursery**

We provide consultation, design, install, maintenance, edible plants & work-exchange.

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(Past class notes, registration and links to further educational materials available below)

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