

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

Oil Crops: Avocado, Macadamia Nut, Pili Nut Part 15 of 24

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: Oil or fat supplies our bodies energy and help us absorb fat soluble vitamins. Avocados are high in oil, highly productive, locally adapted and very easy to prepare. Macadamia nut and Pili nut are extremely high in oil and have a long shelf life but do require more processing. Coconut is a great oil crop covered in next class.

Avocado:

Importance: Easiest source of fat, no husking, prolonged drying, or shelling needed.

Anatomy: Large dense tree casting deep shade, can reach 60 ft if not pruned, plant 30-40 ft apart, fairly shallow rooted, different varieties have different habits, some spread more, often kept pruned around 15-20 ft tall for easier harvest.

Niche in a Food Forest: Full sun, overstory tree, not ideal for most climbing vines.

Varieties: Fruit quality and bearing season are major factors that should be taken into account when choosing varieties for a home garden. Season extension with the goal of having fruit ripening year round is crucial. Spring, summer, fall, winter bearers exist.

Propagation: Seedling trees highly variable, maybe good maybe not. Grafted trees are often higher quality, more regular bearing (fruit every year) trees are usually started from seed and then grafted at pencil to finger width. Ideally under 4000ft elevation.

Cultivation: Does not like waterlogged soil. Select high points for planting to increase drainage if dense soil. If soil is mucky/sticky add black cinder up to 50%. Planting into mounds can also be beneficial. Tolerates a wide variety of soil types and is relatively drought tolerant. Keep well mulched, especially during establishment. Prune only to keep low enough to harvest, ideally after fruiting. Excessive pruning will decrease fruiting

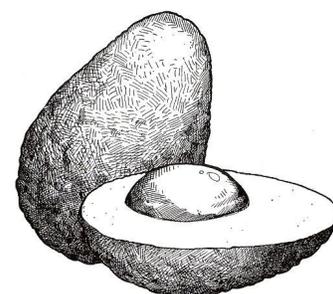
Diseases / Pest Control: Phytophthora root rot, more prone in waterlogged soil identified by dieback in the canopy, leafless branch tips, small and yellowing leaves, normally plentiful surface roots will be fewer, absent or black. Mulching with woody material is most beneficial, apply gypsum or calcium carbonate, Twig borers

Harvest: 3-5 years for grafted trees 3-7 years for seedlings. Stem immediately above fruit turns brown, skin often becomes duller, skin may turn black, or purple or red depending on variety. First fruit of the season have lower oil content. Oil content increases in the height of the bearing season.

Usage, Storage & Preservation: Avocados are harvested when mature and allowed to sit until ripe. Ripeness is usually indicated by softness though with some harder skin varieties it may be harder to determine ripeness, the stem will easily come off when touched when hard skins are ripe. Avocados can be frozen whole or prepared and frozen. Avocados are rarely cooked.



Figure 248. 1-8. *Persea americana* Mill. 1. Flowering branch. 2. Flower. 3. Longitudinal section of flower. 4. Fruit. 5. Stamen from first or second whorl. 6. Stamen from third whorl. 7. Stamens. 8. Fruit. 9. Fruit (1/100). 10. Fruit (1/1000). 11. Fruit (1/10000). Modified by (2008) G. Zhang & P. Peng.



Macadamia Nut:

Anatomy: Large dense tree to 40-50ft

Niche in a Food Forest: Overstory tree casts deep shade.

Varieties: Grafted trees may be able to produce 300-400% more than seedlings.

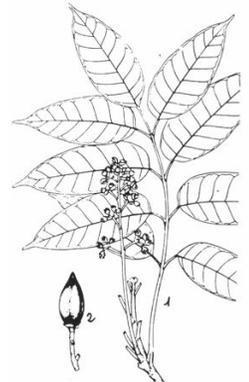
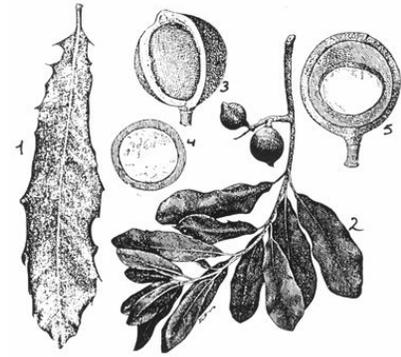
Propagation: Seedling trees will still produce, but much less. Bears in 5-7 yrs.

Cultivation: Likes good drainage. Somewhat drought resistant. Best below 2500ft.

Diseases / Pest Control: pigs and rats will eat fallen ripe nuts.

Harvest: Allow nuts to ripen on tree and fall, then pick up off the ground.

Usage, Storage & Preservation: Collected nuts should be spread out and allowed to dry. The husks will turn brown and crack at which point they can be removed. The hard shell can then be cracked and the nuts can be eaten raw or roasted. Keep best in the shell up to 2 months or more. Nutrition: Per 100g 76g fat, 8g protein, 32% rda Magnesium, 20% iron, 15% B-6, 8% calcium



Pili Nut:

Anatomy: Tall upright tree usually with fewer low branches can get 60 ft+ tall

Niche in a Food Forest: overstory, wants full sun. Can be used in a windbreak.

Propagation: From seed. Fairly variable from seed. Long germination time.

Planting: plant at least 2 trees for best fruiting (cross pollination), tap rooted.

Cultivation: Benefits from mulch and water, widely adapted. To 1200 ft elevation.

Diseases / Pest Control: few pests and diseases. Pigs and rats will eat fallen nuts.

Harvest: Allow nuts to ripen and fall on their own then collect off ground.

Usage, Storage & Preservation: remove husk then allow to dry, then crack open. Do not eat brown seed coat.

<u>Nutrition</u>	<u>Grams</u>		<u>%RDA</u>				
<u>Crop</u>	<u>Fat</u>	<u>Protein</u>	<u>Magnesium</u>	<u>Iron</u>	<u>B-6</u>	<u>Calcium</u>	<u>Carbs</u>
Avocado	15g	2g	7%	3%	15%	1%	9g
Mac Nut	76g	8g	32%	20%	15%	8%	14g
Pili Nut	80g	11g	75%	19%	5%	14%	4g

Further Reading: Specialty crops for pacific islands at agroforestry.org

Next Class: May 11 part 16 of 24. **Oil Crops: Coconut**

Learn all about this amazing multipurpose “tree of life” including how to make coconut milk, and how to use the nut in various stages of ripeness. Roles of dwarf, semi-dwarf and tall.

Become a member of the new Puna Chapter: Hawaii Farmers Union United

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