Plant Aloha Sustainable Farming Series
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Hawaiian Sanctuary
hawaiiansanctuary.com/plantaloha

How to Grow a Complete Diet with Permaculture Principles: Tropical Subsistence Gardening. 24 class series, part 7

Plant Propagation & Home Nursery Maintenance:

Learn how to grow all kinds of food plants from seed, cuttings, division, and more. Learn which trees are "true to seed" and which need grafting to produce.

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. Please give what you can: hawaiiansanctuary.com/donate

Introduction: Different plants require different methods of propagation.

Propagation from Seed:
Planting seeds: As a general rule for planting depth, plant seeds 2.5 times their width. Keep soil moist but not waterlogged. Potting soil has ideal drainage and moisture retention and is free from weed seeds and diseases.
Direct seeding: Fast growing garden plants (often with larger seeds) are usually planted directly into their permanent location. For example, beans, pumpkin, radish,
Seed in nursery: Plants that are slow growing in the begining may be easier to start in 3-4 in. pots in the nursery and then planted out when about 6 in. tall. Ex. kale, tomatoes, eggplant, peppers, or if fruit trees potted into bigger pots till they are 1 to 3 ft tall.

Planting fruit trees from seed: Many varieties of tropical fruit trees seeds may die if allowed to dry out. Planting seeds as quickly as possible is a good rule of thumb.

"True to seed" means the plant that grows from it will be very similar to the parent plant you got the seed from. If a plant is not "true to seed" the plant that you grow from seed may be similar or may be very different from it's parent.

Generally True to seed varieties: Soursop, Lilikoi, Breadnut, Peach Palm, Surinam cherry, Mamey sapote, Abiu, Rollinia, Chico Sapote, Eggfruit, Jaboticaba, Mountain apple,White guava, Cacao, Mangosteen, Star apple, Sour Tamarind, Brazilian cherry, Rangpur lime, Bumpy lemon, Calamondin, key lime

Avocado and jackfruit are sometimes good from seed and sometimes not… it's rolling the dice so to speak. You have to wait 3-7 years for them to fruit to tell. If you have a lot of room you can plant these from seed and "cull" or cut down bad ones and keep the good.

Vegetative propagation: (cloning)
Cuttings: Many plants can be propagated from a piece of stem with most of the leaves trimmed off to reduce transpiration(moisture loss). Rooting powder or hormone is seldom necessary. Ex. basil, okinawa spinach, Brazilian spinach, etc.
Tip cuttings:keep the growing tip of the plant intact, use on plants with hollow stems to prevent stem from collecting water and rotting. Ex. edible hibiscus, chaya
Root cuttings: some plants can be grown from a section of root. Comfrey, breadfruit

Woody cuttings: Some plants need to be propagated from woody (brown or grey)cuttings with green stem and leaves trimmed off. <Ex. katuk, gliricidia, mulberry

Division: generally used on clumping plants, identify stem bases and separate, keeping stem with roots. Ex. Banana, comfrey, lemon grass, vetiver grass, breadfruit.

Air-Layering: Some plants that are not easily propagated by cuttings, division, grafting or seed, can be induced to grow roots before being separated from the mother plant.
A small+woody branch ~1 in. in diameter is girdled(bark removed) from a 1 in wide section from all the way around the branch. The debarked area is treated with rooting hormone and then surrounded with a baseball to softball size wad of moistened sphagnum moss. The moss is covered in plastic and tied at each end and covered in tinfoil to reflect light and heat. Wait 1 to 3 months, check to make sure moss stays moist when roots have filled moss ball, cut from tree and plant into a pot, allow a couple more months for roots to grow into soil before planting.
Often air layered: citrus, longan, lychee, breadfruit, guava, mysore raspberry

Grafting: Fruit trees that are not true to seed are often grafted to ensure the new tree is exactly the same as the parent plant. This involves taking a bud or a cutting from the desired variety "a scion" and splicing it onto the another tree "the rootstock." The rootstock tree is often in a pot and is usually planted from seed. Mature trees of poor quality fruit can be "top worked" or grafted with a new cultivar, eg. Avocado.

Fruit trees best grafted: Avocado, most citrus varieties, jackfruit, mango, longan, lychee, durian, Rambutan, Star Fruit, White sapote, Mamey apple.

Home nursery: nurseries need frequent care, water, soil, pots, tables, shade cloth, labeling,dry storage for fertilizers, etc. Using existing shade can save $ or you can put up a shade structure. Part of the roof can be tarp and part shade cloth to reduce the need to water. Nursery in zone 1, where you see it alot so it gets daily care.
"Up-potting: to avoid "Root bound ": plants allowed to stay in pots too long may become "root bound" (roots curve around and get impacted inside the pot) this can severely affect the future health of the tree. Avoiding "root bound" trees by transplanting them into bigger pots "up-potting" (or into the ground) as soon as roots start to grow out of the bottom of the pot.
Hardening off: before planting plants into the ground from the nursery it's best to slowly acclimate them to the sunnier conditions in the garden or field.

Further Reading: Permacopia by Hunter Beyer volume 1+ 2
Fruits of Warm Climates by Julia Morton
https://hort.purdue.edu/newcrop/morton/index.html

Homework: Propagate plants by seed, cutting, and division. Identify an ideal place for your nursery.

Next Thursday Feb 23rd part 8. Creating Garden Beds & Holes For Fruit Trees:
Learn how to build a variety of styles of garden beds and easier methods for planting trees on rocky ground. Obtaining and balancing soil, hugelkulter, and amending included.

Contact: **Malama Aina Permaculture: Edible Landscape Design, Education & Nursery**
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(Past class notes, registration and links to further educational materials available below)
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