



Plant Aloha Sustainable Farming Series

Thursday, January 26th 2017

Wade Bauer of Malama Aina Permaculture facilitating

hawaiiansanctuary.com/plantaloha

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

Part 4 of 24 Building Soil with Mulch & Nitrogen Fixers:

Learn how to turn the “weed trees” and plants around you into food for the plants you want to grow using “chop and drop”. Nitrogen fixing coppice crops including, pigeon pea, crotalaria, ice cream bean, and gliricidia, will be covered.

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 this amazing FREE program. Please give what you can: hawaiiansanctuary.com/donate

Introduction: In the tropics most nutrients are held in the vegetation, not in the soil, so we need to frequently cycle the nutrients to make them available to plants, mulching is one of the main ways this is done. Plants need, sun, water, a place to grow roots (usually soil), and food. Most places in east Hawaii get enough sun and rain for plants, so soil and nutrients are usually the limiting factors for growth. Mulch feeds the soil. Think of a plant’s roots as its stomach and a plant’s mouth is around its dripline.

Mulch: is plant material placed on the ground, can be fine like wood-chips or coarse like branches and logs. Green leafy material is high in nitrogen, brown woody or dry materials are higher in carbon. Mulch breaks down to hummus, an organic part of the soil that holds nutrients and moisture.

Coppicing: is aka “chop and drop” cutting back woody plants (usually to waist high), mulch to the dripline of the nearest fruit tree, let stump regrow and repeat... Cutting is usually done with a machete, but hand saws, and chainsaws, or kamas (sickles) can also be used depending on the material being cut..

Mulch functions: 1. Suppress weeds 2. Preserves moisture 3. Feeds soil organisms and plants

Mulch Sources

1. Existing “weed trees” cane grass, melastoma (puna rose) palm fronds, coconut husks, tree trimmings, leaves, grass clippings, branches, logs, cardboard, etc
2. Plants that we plant specifically for mulch (nitrogen fixers and mulch plants below)
3. Hilo mulch, green waste recycling pre-composted and ground yard debris
4. Wood chip, from tree trimmers
5. Macadamia nut husks, or composted mac nut husks from local macnut farm or gravel yard

Trees to avoid as mulch: avoid trees that root extremely easily from cuttings such as african tulip and rubber tree, panax, ti, ironwood is allelopathic (inhibits growth of other plants)

Frequency of application: keep soil covered, every 6 mo for hilo mulch, when flowering before seeding

Mulching Gardens: Rake fallen leaves and cut fresh leaves, comfrey, vetiver (like straw), weed trees, etc, Hilo green waste mulch, Macadamia nut compost can bring in

Mulching Fruit Trees

- Where? Around drip line (edge of canopy)
- Keep mulch very thin (1 inch) against trunk of tree,

- Create doughnut of mulch ~ extending 2ft before dripline and 2ft past dripline and 6in or deeper, and keep mulch shallow 1 in deep for 1ft diameter around the trunk .

Sheet Mulching: smothering weeds with cardboard or newspaper then placing mulch over the top. Can make holes and plant through mulch and cardboard into soil immediately.

Mulch Plants: placement can be clumps of plantings between crops, contour hedgerows between crops
Existing “Weed trees” (long lived): melocia, cercropia, gunpowder, albezia (n fixer), guava,

Nitrogen fixing trees (long lived 15+ yrs) (coppice with machete or saw)

- Gliricidia, from woody cuttings (can be living fence posts), plant ~10-20ft+ from crop, cut at 15ft
- Icecream bean, from seed, sun to part shade, 60+ ft not cut, plant~10-20ft+ from crop, cut at 15ft

Nitrogen fixing shrubs (short lived 2-5 yrs)

- Crotolaria, aka “Rattle pod” , from seed, 6-8ft tall-wide, plant 8-15 ft from crop
- Pigeon pea, spacing as coppice, from seed 10ft tall-wide, plant 8-15 ft from crop

Nitrogen fixing groundcovers: (long lived, shade tolerant, mowable)

- Perennial peanut, sun to shade, from cuttings, to 1ft tall spreading, mow or kama
- Creeping desmodium, sun to part shade, to 6in tall spreading, mow

Non N-fixing mulch herbaceous plants (can be used as border to exclude creeping weeds)

- Vetiver, from division, sun, 4ft wide by 6 ft tall, plant 10-15ft from crop, or on border
- Comfrey, from division, sun-part shade, 2.5 ft wide by 2ft tall, plant 1-3ft from plant, or border
- Lemongrass, full sun, from division, 3ft wide 3ft tall, plant 3-10 ft from crop, or on border

Non N-Fixing shrubs: Perennial sunflower, from woody cuttings, 15 ft tall sprawling, 10-20 ft from crop

Further Reading: agroforestry.net by Craig Elevitch and Kim Wilkinson, 1. “Working With Weeds In The Tropics” <http://agroforestry.net/free-publications/working-with-weeds>, 2. “Nitrogen Fixing Trees - Multipurpose Pioneers” <http://agroforestry.net/free-publications/nitrogen-fixing-trees> 3. “Sheet Mulching” <http://agroforestry.net/free-publications/sheet-mulching>

Homework: Coppice a weed tree and mulch it around the dripline of a fruit tree.

Next Thursday Feb 2nd part 5 Organic Soil Amendments & Fertilizers for Hawaii:

Learn how to correct the most common local ph, mineral, and nutrient imbalances to enhance plant growth. How to fertilize plants, where to source local amendments, and where to get a soil test.

To register for upcoming classes please email: plantaloha@hawaiiansanctuary.com

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 and links to further reading and educational materials available below)



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