

**Plant Aloha** <http://hawaiiansanctuary.com/plantaloha>

Thursday, September 7, 2017

Wade Bauer of [Malama Aina Permaculture](#) facilitating



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

### **Pest and Disease Management** part 22 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:**

If you grow it they will come. These are just a few of the major pests and diseases that can affect food plants in Hawaii. Fire ants will not be covered today. An entire class will be devoted to them this sat.

#### **Slugs and Snails**

**Anatomy:** Several varieties of slugs, semi-slug, cuban slug, giant african snail. Young slugs can be very small. Slugs and snails can be a host for rat-lungworm disease which can be debilitating and even fatal to humans.

**Habitat:** Snails and slugs like moist crevices, things to hide under, etc.

**Control methods:** **barriers**-cinder or low mowed grass areas around garden can help exclude, reduce preferred habitat around garden areas. **traps**- a board or palm frond base can be placed in the garden, slugs and snails will seek refuge under it, flip over during day and collect and kill. **Bait**- organic slug and snail poison often made with iron phosphate can be used around garden beds. **Handpicking**- can reduce populations especially with snails, be sure to use gloves. I recommend a combination of all of the above for good control. Cooking food for 5 minutes will destroy the pathogen. Copper barriers and moats can be expensive and may work to varying degrees on very small raised beds built on stilts.

#### **Feral Pigs**

**Habitat:** Diverse, widespread. Some areas may not be affected, though most are.

**Damage:** Starchy root crops, taro, sweet potato, cassava, uhi can be eaten by pigs. Pigs may till and wreak havoc in gardens and around fruit trees where they will dig through soil and push piles of mulch to eat the insects under them. They can till up lawn. They can girdle(chew the bark off all the way around) young trees, very young palms may be chewed off, and breadfruit trees and pili nut tree trunks seem to be especially attractive, they can eat entire banana plants.

**Control:** Fencing, pig fencing, electric fence, 4 strand low barbed wire. Trapping and hunting can help reduce the population and turn these destructive pests into a protein and fat rich resource.

#### **Rodents**

**Habitat:** will build nests in trees or brush, racks of bananas, crawl spaces, etc, etc..

**Damage:** will eat near ripe fruit of many varieties, bananas, avocado, lilikoi and many other sweets fruit. Sweet potatoes, pumpkin, etc. Can spread diseases to humans, such as leptospirosis.

**Control:** cats can help reduce population, don't feed them too much so they will hunt. Traps. Poison can inadvertently poison dogs, cats and raptors. Picking fruit promptly when it is just ripening is extremely important to beat the rodents to it. Aluminum rings around trunks of trees may exclude rodents.

#### **Root Knot Nematode**

**Anatomy:** parasitic nematode, that can infect plant roots.

**Habitat:** poor soils low in organic matter. Fill soil may be infected. Affects many fruits and vegetables.

**Damage:** causes nodule like growths on roots of many different plants. Can stunt growth or be fatal.

**Control Methods:** add compost, mulch and other organic matter. Solarization can be done by tilling soil and covering with a tarp to heat. Nematicidal marigolds, french marigolds, mustard, or crotalaria can be grown nearby susceptible plants, and or cut and tilled into soils, or used as mulch.

### **Phytophthora Root Rot**

**Anatomy:** Fungal-like, effects feeder roots of trees, avocado and others,

**Habitat:** heavy clay or waterlogged soils can contribute to occurrence, plant high and increase drainage.

**Damage:** large areas of trees leaves may suddenly wilt, leaves brown and drop, leaving areas defoliated.

**Control Methods:** adding compost and mulch, calcium, gypsum, increasing drainage if possible, trees can survive after infection and recover though lifespan may be reduced, some rootstocks are resistant.

### **Banana Corm Borer**

**Anatomy:** Weevil, lays eggs on banana corm, larvae burrow through roots, black tunnels on corms.

**Damage:** general decline of plant, slow growth, reduced or no fruiting, toppling plants.

**Control:** avoid planting infected starts. Starts can be trimmed of roots and dipped in 10% bleach solution for 5 minutes to sterilize. Traps of halved sections of trunk laid on ground attract weevils then hand pick.

Neem cake as biocontrol, 60-100g every 6 months, keep 2ft around bases of trees clear.

### **Banana Bunchy Top Virus BBTV**

**Anatomy:** Viral, spread by aphids. Infected aphids can be blown in high winds, or transported on plants.

**Habitat:** inside host plants, banana, heliconia, ginger, ti may be alternative hosts.

**Damage:** new leaves bunched together, no fruit or deformed or stunted fruit.

**Control:** No cure. Can spread rapidly. Monitor plants for symptoms to contain outbreaks. Kill aphids on infected plants first with soapy water spray or they can spread disease. Then inject plant with poison (glyphosate recommended by county) or cut down entire entire patch and dig up and kill corms, leaving roots in ground and covering with weed-mat for a long period may work but patch will try to regrow.

### **Coconut Heart Rot**

**Anatomy:** Fungal, spread by spores by wind, rain and soil. Especially in very windy wet weather.

**Damage:** central leaf dies first then radiates outward till entire crown is dead. Almost always fatal.

**Control:** remove and destroy infected trees, especially their crowns, leaves bud etc.. Burning is recommended. Standing dead trunks may spread disease, bottoms of trunks may not be infected.

**Tool Sterilization** with rubbing alcohol can help prevent the spread of many diseases.

**Insect Sprays** BT for caterpillars, insecticidal soap for aphids, neem for a wide range of problems, including fungus and insects.

**Next Class:** Thursday Sept.14th. **Home Orchard & Food Forest Design:** part 23

### **Malama Aina Permaculture:**

#### **Edible Landscape Design, Education & Nursery**

Providing consultation, design, install, maintenance & edible plants

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Malama Aina Permaculture

**Tonight: HFUU Puna Chapter Meeting**

5:00-6:30 Locavore Potluck (Pule at 5:30)

6:30-7:00 Plant Auction and Crop Sale

7:00-8:00 Education Session and Movie: Business Development and Aina ~ That Which Feeds Us