# Developing Online Programming

## Review of GoFarm Hawaii and the Master Gardener's Online Modules

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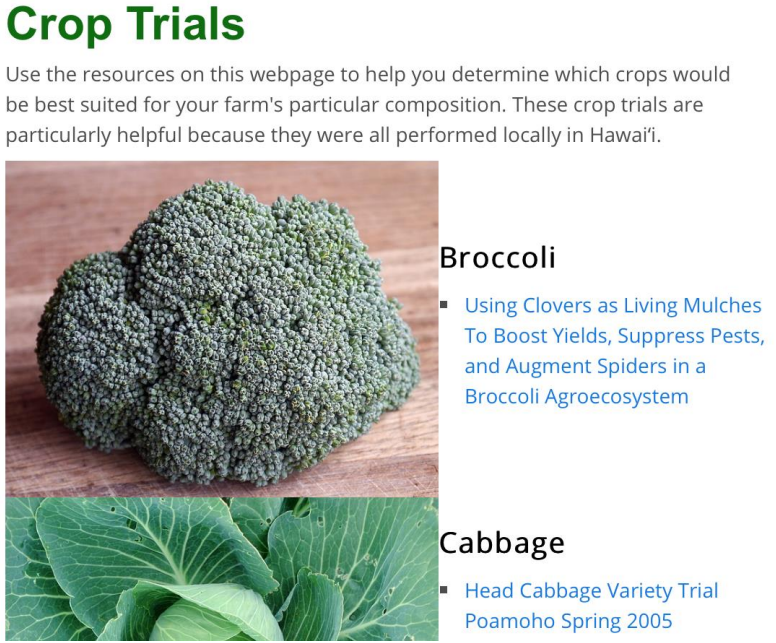
# Online Module Benefits

- Can be used to supplement face-to-face sessions
- Allows students throughout the state to learn from experts
- Build community within the program
- Centralized Hawaii specific information



# GoFarm Hawaii

- Started development in 2014
- Provided training and support in Laulima, Camtasia, and CMS
- Developed interactive plant activity and flow chart
- Support GoFarm sites across Oahu, Maui, Kauai, and Big Island

# Soil and Crop Nutrition

## General Overview

The ultimate goal of a sustainable farming venture in Hawai'i is to integrate components so that overall biological efficiency is improved, biodiversity is preserved, and the system's productivity and its self-regulating capacity is maintained. The goal is to design a system that mimics the structure and function of local natural ecosystems; one that promotes nutrient recycling and high soil cover to prevent resource losses. By designing farming systems that mimic nature, optimal use can be made of sunlight, soil nutrients and rainfall.

To achieve good yield and quality, nutrient balance has to be maintained. Nutrient imbalance may result in deficiencies, toxicities or interference of one nutrient with the absorption of others. This may result in stress to the crop, causing a decrease in quality and/or yield. In this module, we will go over crop nutrient requirements and learn the essential elements vital to a plants life and vigor. We will consider the symbiotic relationships involved in nutrient production and delivery. We will appreciate the intricacies involved in a sustainable farming system unique to the Hawai'ian Islands.

## Student Learning Outcomes

Students will be able to...

- define pH and describe its effects on nutrient availability


### General Overview

Soil health is the foundation of productive farming practices. The goal of good soil management is to meet essential plant needs for water, nutrients, oxygen, and provide a medium to hold their roots with as little management as possible. Fertile soil provides essential nutrients to plants. Important physical characteristics of soil-like structures and aggregation allow water and air to infiltrate, roots to explore, and biota to thrive. Diverse and active biological communities help soil resist physical degradation and cycle nutrients at rates to meet plant needs.

This module will consist of an introduction to soil components such as structure, texture, pH, and other qualities that make up a healthy, high quality soil.

## Student Learning Outcomes

Students will be able to..

- describe the process of soil development and formation
- demonstrate and describe qualities of soil texture and structure
- describe the effects of pH on soil and crop health
- propose ways to change pH to optimize crop production
- evaluate the pros and cons of till, no-till, and minimum till approaches

### Weekly Quiz

All AgSchool quizzes are administered through Laulima. If you are unfamiliar with Laulima, please watch this video first.

- Sample Soils Quiz with answers

### Lecture Content

Please go over the following resources before class. These will help you with your weekly quizzes.

#### Readings

- Introduction and Chapter 2 from *Building Soils for Better Crops* by SARE
- Pages 97-102 from *Gardening at the Dragon's Gate* by Wendy Johnson
- Fact Sheet 18: Record Keeping by New Entry Sustainable Farming Project

#### Recommended Videos

- Introduction to Soils by Jay Bost
- Understanding and Managing Soils for a Healthy and Productive Landscape by Dr. Jonathan Deenik
- *Symphony of the Soils.* Click here to view the trailer on Youtube.

#### Study Guide

- Introduction to Soils
- Student Workbook
- Glossary

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# WHAT'S WRONG WITH MY COMPOST PILE?

*Start by picking a general problem area*

## Moisture

Is your pile wet?

- Oh, yeah!
  - **Too compacted, and not enough oxygen!** Fluff it up! Turn your pile, and shake materials apart to aerate it.
- It's as dry as a desert!
  - **Your pile is thirsty!** Turn your pile and add water. Moisten new materials before adding. If the pile is out and open, cover it with straw or a plastic cover. Your whole pile should be as damp as a wrung-out sponge.
- Only in the middle
  - **Your compost pile may be too small** Gather enough materials to form a pile 3 ft. x 3 ft. x 3 ft., or insulate the sides and cover the top

## Temperature

Is the pile warm?

- Not at all!
  - Is the pile small?
    - Yes
      - **Your compost pile may be too small** Gather enough materials to form a pile 3 ft. x 3 ft. x 3 ft., or insulate the sides and cover the top
    - No
      - Is the pile damp and sweet smelling?
        - Oh, yeah!
          - **Your compost pile needs oxygen** Try turning or fluffing the pile first. If that still doesn't work, then mix in fresh grass clippings, manure, blood meal, or other nitrogen-rich materials. If it's difficult to turn the pile, poke holes, and add the materials that way.
        - Not really
          - How's the weather?
            - Cold!
              - **Your compost pile may be too cold** Try increasing the pile size, or insulate it with straw or a plastic cover
            - Same as usual
              - **Your compost might be done!** If the pile was built over several months, don't worry about it. Let the pile compost "cold." When it looks dark and crumbly, and smells earthy, it may be done, and you can use it!

## Odor

Does it smell like

- Nope!
  - **Too compacted, and not enough oxygen!** Fluff it up! Turn your pile, and shake materials apart to aerate it.
- No, more rancid
  - **Too compacted, and needs aeration** Break up the layers with a garden fork, or shred them, and then re-layer the pile. Avoid adding heavy layers of leaves, grass clippings, hay, or paper.

## Pests

## Decomposition

Describe your pile: large undecomposed items, or layers of undecomposed grass and leaves?

- Large items!
  - **The size and composition of your materials need work** Screen out the undecomposed items. Reduce the size if necessary, and use them in a new pile.
- Leaves and grass!
  - **Too compacted, and needs aeration** Break up the layers with a garden fork, or shred them, and then re-layer the pile. Avoid adding heavy layers of leaves, grass clippings, hay, or paper.


https://www.ctahr.hawaii.edu/courses/GoFarm/plant_sort2/plant_sort2.htm

# Fungus

- 85% of plant diseases are caused by fungal or fungal-like organisms
- Symptoms:
  - Below the soil, the plant may have rotting, swollen, or dead roots
  - Above the soil, plants may display leaf spots, mildews (white or gray powdery patches), rusts and wilts
  - The stems of new seedlings can rot and flop over


*This hydrangea plant has Cercospora fungi*

# Diagnosis Practice

Virus

Vector

Submit

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# Diagnosis Practice



Correct! The tomato plant on the left is infected with the Yellow Leaf Curl Virus and the corn plant on the right is infected with Banks Grass Mites.

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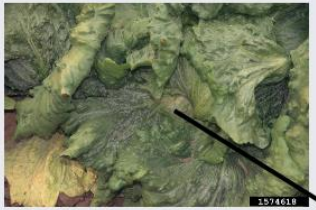
# Review: Check Your Understanding




Nutrient Deficiency

Fungus

Bacteria

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# Where Are We?

- Ongoing maintenance
- Adding new material
- Continued support to new cohorts of students

# Master Gardener

- Started development in 2016
- Provided training and support in CMS, and GMS
- Developed interactive beneficial insects module
- Support Master Gardener Sites throughout the State


**General Overview**

One reason we feel "lucky live Hawai'i" is our fruit! A walk through any neighborhood reveals an amazing array of fruit – mango, papaya, banana, citrus, and much more. In this unit you will learn how to care for the more commonly grown fruits of island home gardens, plus some basic skills long-term care. Learn a bit about pruning and grafting for care of tree crops like mango and avocado. Managing pests while protecting pollinator insects like bees and flowerflies will allow you to have plenty of fruit to share.

**Learning Objectives**

At the conclusion of this module, you will be able to:

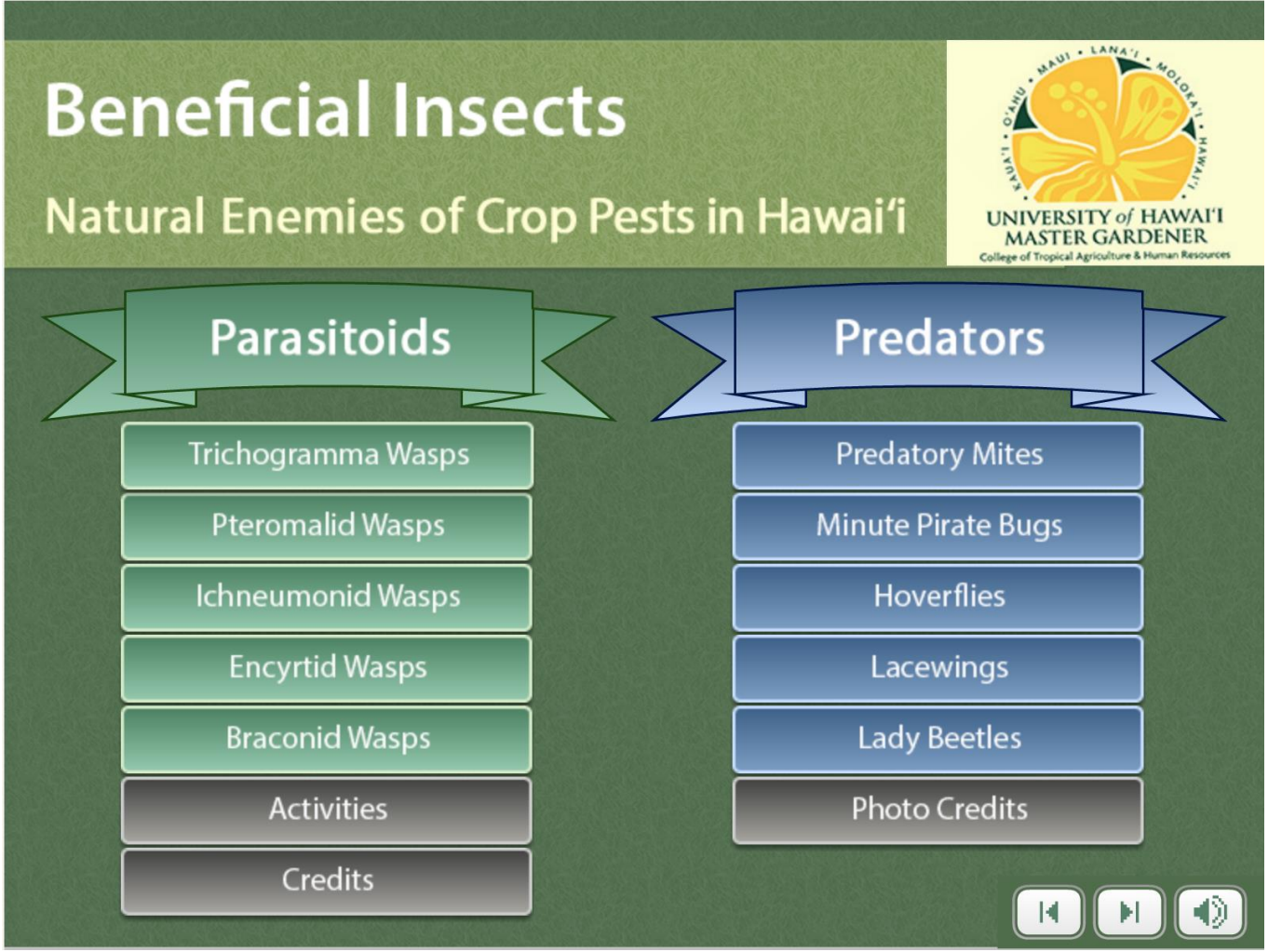
- Name 5-10 locally grown fruits in Hawaii.
- Locate science-based literature to distribute to home gardeners on how to grow 3-5 local fruits.
- Suggest 3 strategies to reduce poisoning polllinator insects.

**Lesson Materials**

- California Manual, Chpt 18: Citrus
- Banana & Plantain by Jeff Daniells, Lois Englberger, & Adelino Lorens
- Citrus for Hawai'i's Yards and Gardens by CTAHR Extension Service
- CTAHR Publications: Fruit
- Fertilizers for Fruit Trees in the Home Garden by Wade W. McCall & C. L. Chia
- Mango by C. L. Chia & D. O. Evans
- Why Some Papaya Plants Fail to Fruit by C. L. Chia & Richard M. Manshardt
- REVIEW: Easy as 1-2-3: Fruit Fly Suppression for the Backyard Grower by Hawaii Areawide Fruit Fly Pest Management Program

**Resources**

- Avocado by C. L. Chia & D. O. Evans
- Breadfruit by Diane Ragone
- Non-Invasive Fruit Trees for Gardens in Hawai'i by Patti Clifford & Kent Kobayashi
- Pruning Landscape Trees and Shrubs
- Grafting Avocados Part 1: Theory and Tools (Ty McDonald)
- Grafting Avocados Part 2: Making the Graft (Ty McDonald)
- California Manual, Chpt 17: Temperate Tree Fruit and Nut Crops
- California Manual, Chpt 19: Avocados

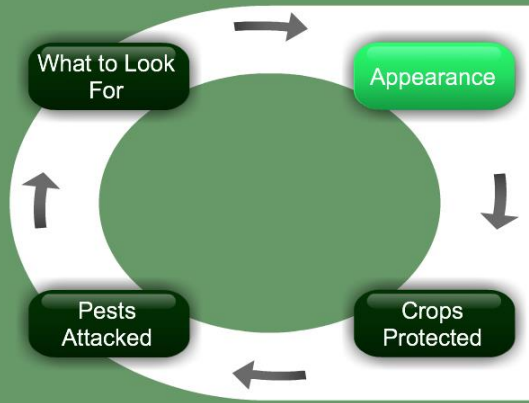



https://www.ctahr.hawaii.edu/courses/test/beneficial_insects/beneficial_insects.htm

# Ichneumonid Wasps

Parasitoids

Ichneumonid wasps are attracted to the food source of their host pests, primarily vegetable crops, and to sources of available nectar, such as shallow, open-faced flowers, daisy-family flowers, and angelica.




Adults range from 1/8 inch to 5 inches long, including their stinger-like, egg-laying ovipositor.

Their bodies are tan, brown, or black, and their wings may be shaded with blue and brown.

# Predatory Mites

Predators

Adult predatory mite with spider mite eggs.

# Drag and Drop the Insects in Correct Cans!

Parasitoids

Predators

True/False

Question 9 of 14

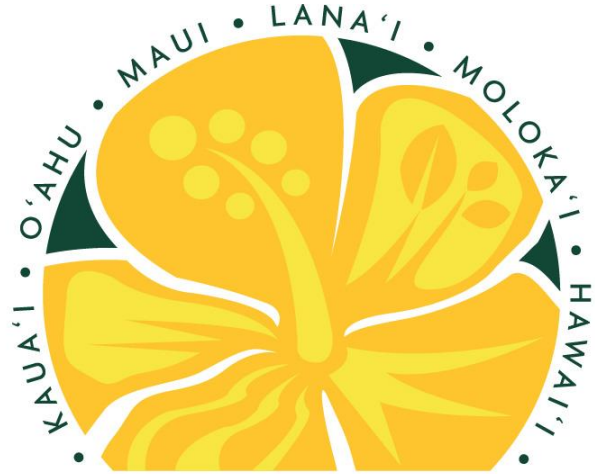
**If you see an insect on your plants, you should immediately spray it with an organic pesticide.**

- A) True
- B) False

Submit

# Where Are We?

- Adopted by all MG Coordinators
- Inviting MG Trainees and Alumni
- Pilot Test 3 Modules



# Mahalo

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