Sustainable Resources 11

INTEGRATED PEST MANAGEMENT

What is a Pest?

Pest is an organism that reduces the availability, quality, or value of some human resource.

Examples of Pests

- 1. Insects (aphids, whitefly, fungus gnats)
- 2. Vertebrates (coyotes, mice, deer, birds)
- 3. Microorganisms (bacteria, viruses, fungi)
- 4. Weeds



Beneficial or Biologicals

An organism that is used to control pest populations.



Predators and Parasitoids



1. Predator: Hunts and eats its prey, killing it.

2. Parasitoid: Young stages develop on or within the host, killing it

Insects, Predatory Mites (Acari), Nematodes

What is a Resource?

A resource is a plant or animal grown for food, fiber, or pleasure.



What is Integrated Pest Management

- 1. Integrated Pest Management (IPM) is a decision-making process that uses all necessary techniques to suppress pests effectively, economically and in an environmentally sound manner.
- 2. Conventional: relies mostly on pesticides
- 3. Organic: uses no pesticides

Objectives of IPM

- 1. To reduce reliance on pesticides
- 2. Minimize disruption of environment
- 3. To provide a self supporting, sustainable approach to managing pests

Sardis Greenhouse IPM

"The Bug Factory" is a company that specializes in IPM. They are supporting us through products and expertise.



Pests in Sardis Greenhouse Let's go to "<u>The Bug Factory</u>" website for descriptions.





Insects life cycle METAMORPHOSIS (Transformation)

change form





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METAMORPHOSIS



1. Complete: 4 stages egg, larva, pupa, adult

2. Incomplete: 3 stages egg, nymphs, adult



Incomplete and Complete Metamorphosis



Aphids Incomplete



http://www.ohp.com/Pest_Solution s/SFC_Nursery/aphids.php Ladybugs Complete



Why knowing bug life cycles ?

1. Pest and Natural enemy identification 2. Beneficial insect can be stage specific 3. Beneficial insect may feed/reproduce on the pest at certain stage 4. Design a biocontrol strategy (combo) 5. Timing natural enemy releases or chemical treatments





I.D. Pests
Visually
Yellow Sticky Traps
Keep records

2. Proactive vs. ReactiveVaccinesLess \$



What can growers do to implement biological control ?



Banker plants (alfalfa, barley plants)
Repellent plants (basils, marigolds)
Trap plants (eggplants, bean plants)

Plants that will sustain the biologicals (BUG GARDEN)

What can growers do to implement biological cont

- Use a combination of parasitoids and predators when available
- Start bio releases as soon as weather permits (require time to establish)
- Follow rate recommendations and application instructions

Pests in our Greenhouse

- 1. Aphids: extract nutrients, leave residue, transmit viruses and toxins.
- 2. Whitefly: larvae eat plant sap, leave residue that can get moldy.
- 3. Thrips: pierce plant cells and eat contents.
- 4. Spidermites: They suck plant sap.
- 5. Caterpillars: Eat plant leaves.

Aphids









Whitefly

















Spidermites







Beneficial Insects at Sardis

- 1. Cucumeris-Amblyseius: is a predator of thrips.
- 2. Adali Bipunctata: (Ladybugs) are predators of aphids.
- 3. Aphidius colemani: is a parisitoid of aphids.
- 4. Encarsia formosa: is a parisitoid of whitefly.
- 5. Cryptolaemus montrouzieri: is a predator of aphids

Assignment:

Do IPM worksheet