Understanding Integrated Pest Management

Integrated Pest Management

- ***Integrated pest management (IPM)*** is a pest management strategy that uses a combination of best management practices (BMP) to reduce pest damage with the least disruption to the environment.

IPM

- ***Best management practices (BMPs)*** are those practices that combine scientific research with practical knowledge to optimize production and increase crop quality while maintaining environmental integrity.

IPM

- The key to a successful IPM program is ***scouting***, which involves regularly monitoring pest populations and crop conditions.
- A scout collects data about which pests are causing damage, what stage of life each pest is in, and whether the pest population is increasing or decreasing.
- Knowing how to identify key pests and their biological characteristics is important.

IPM

- The benefits of IPM to the horticulture industry:

  a. There are reduced pesticide costs in addition to fewer pesticides used with IPM.

  b. Application costs are reduced due to time, and the cost of labor for pesticide application is reduced.

  c. Less pesticide resistance develops within populations of insects, weeds, and diseases.

IPM

- IPM also benefits the environment, which is made more sustainable and friendly to people.
- Benefits of IPM to the environment:

  a. Reduced contamination and degradation of the environment occurs through the use of IPM.

  - Pesticide residues do not build up in soil, water, and other natural resources.

  b. Cancer-causing residues are present in smaller amounts or are not on food at all.

  - Less pesticide residue on food products means a decreased chance of people ingesting pesticides.

IPM

- Healthy greenhouse crops are essential to a successful greenhouse business.
  - ***Plant health*** refers to the condition of plants.
  - Healthy plants are free of pests and disease.
  - They have clean foliage and flowers, along with a good rate of growth.
  - It is important that plants be healthy while they are growing and developing.
  - It is also important that their health be maintained after they are sold.

IPM

- Healthy plants have a greater capacity to defend themselves against plant pests than plants under some type of stress.
- Plant stress is usually associated with environmental conditions.
  - Improper watering weakens a plant's ability to fight off infectious diseases, including root rots.
  - High humidity in greenhouses is ideal for many fungal diseases.

IPM

- Growers have control over many environmental factors that can help keep plants healthy.
  1. provide a growing medium with the desired drainage, aeration, and pH.
  2. Plants can be planted at the proper planting depth.
  3. Optimum nutrient levels can be maintained with fertilizers.
  4. One of the most important factors is to follow recommended watering practices & ppm.
  5. Temperature, light intensity, and air quality can be adjusted to meet the needs of specific crop.

IPM

- No matter how well crops are grown, pests and diseases will become problems from time to time.
  - The very nature of greenhouse crop production leads to some disease problems.
  - In most cases, crops are of the same species, variety, or cultivar.
  - Being of identical genetic makeup, they are vulnerable to infectious disease that can easily spread from one plant to another.
- Greenhouses also tend to be humid, which is ideal for many fungal diseases.

IPM

- The IPM program for greenhouse crops must be year-round.
- IPM control measures for a specific crop (e.g., poinsettias) should begin before the plants enter the greenhouse.
  - Four broad areas of control include sanitation, cultural/physical control, biological control, and chemical control.

Pests

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Pests

- ***Insects*** are a group of animals with an exoskeleton and three body parts.
- Most insects have six legs and four wings.
- More than 800,000 kinds of insects have been identified.
- Insects are capable of producing large numbers of offspring in a short time and can cause economical loss by feeding on horticultural crops.

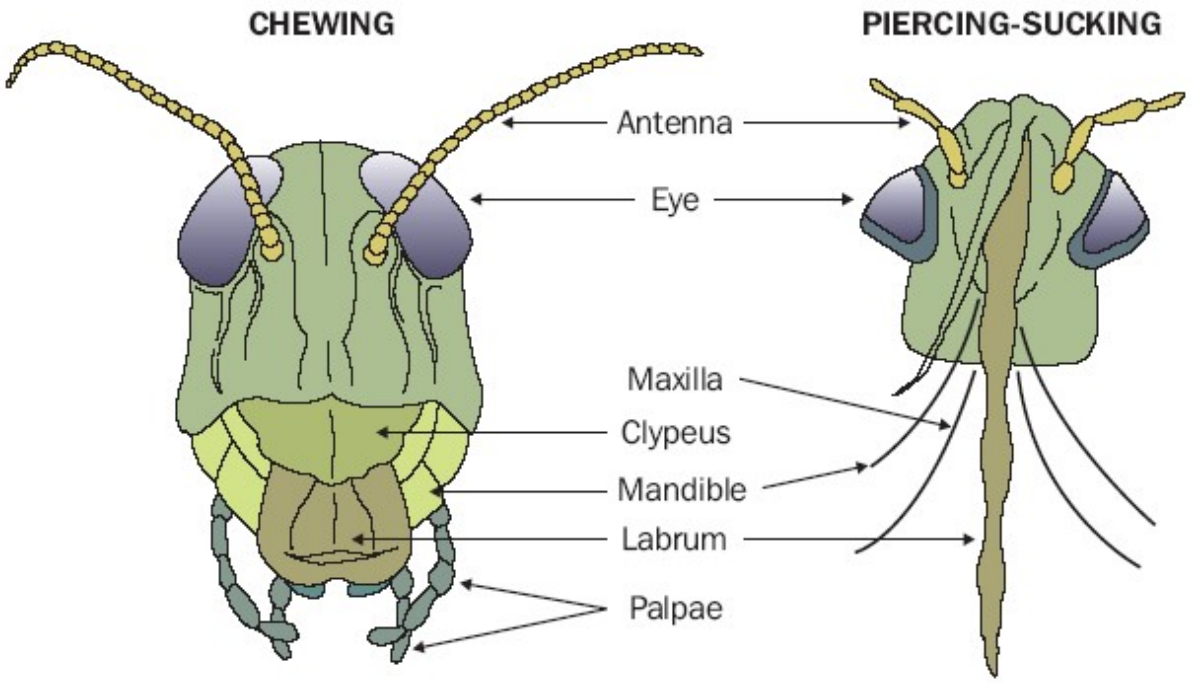
Pests

1. Insects have either chewing or sucking mouthparts.

- Damage symptoms caused by chewing insects are leaf defoliation, leaf mining, stem boring, and root feeding.
- Insects with sucking mouthparts produce distorted plant growth, leaf stippling, and leaf burn.

Pests

MOUTHPARTS OF CHEWING AND PIERCING-SUCKING INSECTS



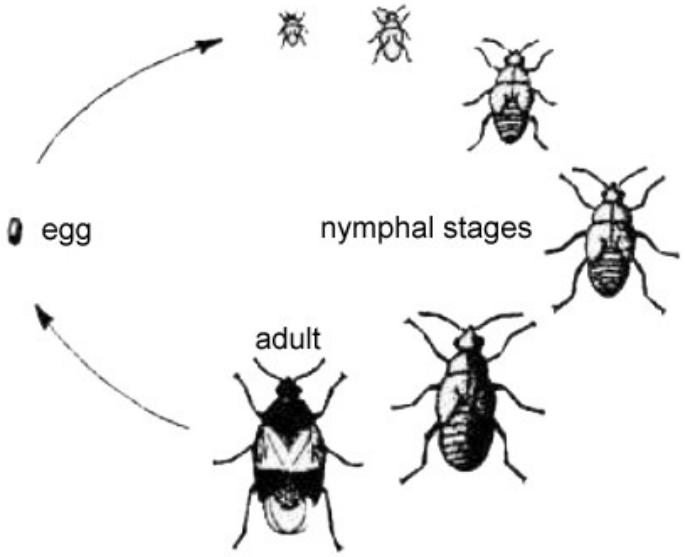
Pests

2. As an insect grows from an egg to an adult, it passes through several growth stages, which is called metamorphosis.

- Two types of metamorphosis exist: *incomplete & complete*.

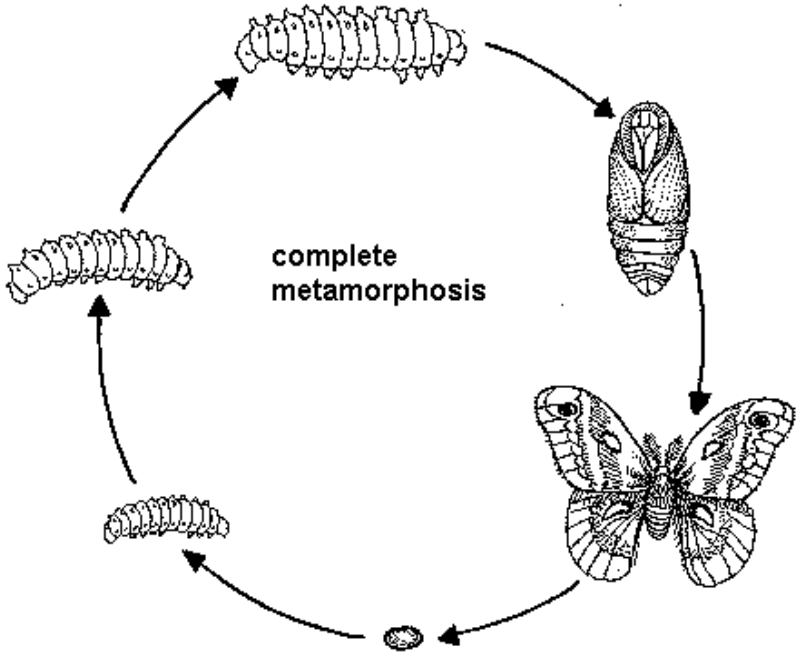
Pests

- a. *Incomplete metamorphosis* consists of three life stages: egg, nymph, and adult.
  - As a nymph, the insect grows and passes through several *instars* between molts.
  - Each time the insect molts or sheds its exoskeleton, it passes into the next instar.



Pests

- b. Complete metamorphosis consists of four life stages: egg, larva, pupa, and adult.
  - The larva stage is the period when the insect grows.
  - The pupa is a resting period where a dramatic morphological change from larva to adult occurs.



Pests

- ***Aphids*** are pear-shaped, soft-bodied, usually wingless insects.
- They are often green or yellowish in color.
- Aphids have the ability to reproduce very rapidly.
- *They give birth to live young that are pregnant*!
- Aphids use their mouthparts to pierce the plant & suck out juices.
- Aphids attack a wide variety of greenhouse plants.

Aphids

Pests

- ***Fungus gnats*** are long-legged, winged, gray-black insects less than 1/8 inch long.
  - The larvae of fungus gnats feed on root hairs & tunnel into plant stems.
  - They prefer a growing medium that is constantly damp.

Pests

- Many types of ***scale*** insects infest greenhouse plants.
  - Typically, they have flat, oval, often brown bodies.
  - They may or may not be covered with armored shells.
  - Scale insects pierce plant leaves, stems and suck juices.
- ***Western flower thrips*** are small dark brown insects with two pairs of fringed wings.
  - They have rasping mouthparts that scrape plant tissue.
  - The damage they cause to many kinds of plants often appears as whitish discoloration.

Pests

- ***Whiteflies*** are small white insects.
  - They generally camp out on the undersides of leaves, where they pierce the tissues and suck juices.
  - Their flat, scale-like larvae feed on the undersides of leaves.

Whitefly