

## PEST AND PEST CONTROL

**Pest**- any undesirable organism that is injurious to plants, either directly (ex. insects, or fungi) or indirectly (ex. weeds).

### THREE PREREQUISITES OF PEST DAMAGE OR INFECTION

- 1) **plant susceptible**
- 2) **pest present**
- 3) **proper environment**

### PEST DAMAGE CONTROL

- 1) **Plant Resistance**
  - a) **Genetic Resistance** - this is the "**ideal**" method of pest damage control
- 2) **Proper Environment**
  - a) **Favorable for plant**
  - b) **Unfavorable for pest**
- 3) **Eliminate Pest**
  - a) **Quarantine** - usually governmentally imposed
  - b) **Sanitation** - wash pots and tools, hoses off ground, propagate clean plants, etc.
  - c) **Physical Control** - bug traps, screens, sticky boards, etc.
  - d) **Biological Control** - the use of one organism to control another organism.
    - 1) *Bacillus thuringiensis* - a bacterium that controls caterpillars
    - 2) grass carp (or white amour) - a fish that eats submerged aquatic weeds
    - 3) predaceous mites - eat other mites and small insects
    - 4) parasitic wasps - lay eggs inside other insects
    - 5) *Trichoderma* - a fungus that controls other fungi
    - 6) **allelopathy** - secretion of chemicals by one plant that retards the growth of surrounding plants
  - e) **Pesticides**- chemicals used to control pests; ex. fungicide, bactericide, insecticide, miticide, herbicide.
 

**Modes of Action**

    - 1) **Contact Pesticide** (insects and weeds)
    - 2) **Systemic Pesticide** (insects and weeds)
    - 3) **Stomach Poison** (insects only)

**Integrated Pest Management (IPM)** - the use of all strategies of pest damage control (resistance, cultural, biological, environmental and chemical) to minimize the economic impact of pests.

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## TYPES OF PESTS - INSECTS

### INSECTS

#### Class Insecta

#### Characterized by:

- **6 legs**
- **3 body regions; head, thorax, abdomen**
- **1 pair antenna**
- **wings (may be reduced or vestigial)**

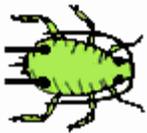
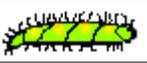
**Order Hemiptera** - very common insect pests on horticultural crops

#### Characterized by:

- **sucking mouth parts** that extract phloem sap
- secretion of **honey dew** - a sugary liquid secreted by Homoptera
- presence of **sooty mold** - a black to brown mold that grows on honey dew on the leaf surface

does not infect plant)

- o includes aphids, mealybugs, scale and whitefly listed below

	1) <b>aphid</b> - sucking mouth parts; small soft bodies, green, brown or black; around growing point; ants may "farm".
	2) <b>mealybug</b> - sucking mouth parts; soft bodies covered with cottony wax filaments
	3) <b>scale</b> - sucking mouth parts; covered by a hard shell
	4) <b>whitefly</b> - immature with sucking mouth parts; as translucent ovals under the leaf; adults as small white flies
	5) <b>thrips</b> - rasping-sucking mouth parts; cause lesions on young leaves and flower petals
	6) <b>leaf miner</b> - bore meandering tunnels through leaves
	7) <b>caterpillar</b> - have chewing mouth parts and eat whole tissues; leave droppings
	8) <b>grub</b> and <b>borer</b> - larva of beetles; feed on roots, bore into wood of stems
	9) <b>beetle</b> - have chewing mouth parts and eat whole tissues
	10) <b>grasshopper</b> - have chewing mouth parts and eat whole tissues
	11) <b>weevil</b> - feed mainly on stored grain.

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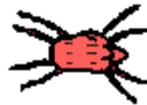
## TYPES OF PESTS - ARACHNIDS, NEMATODES AND MOLLUSKS

### MITES

**Class Arachnida** (mites, spiders, ticks, scorpions)

**Characterized by:**

- 8 legs
- 2 body regions; cephalothorax, abdomen
- no antenna or wings

	1) <b>spider mite, red spider or spotted mite</b> - very small; cause a fine yellow speckling on leaves where they feed, and form webs when severe
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**NEMATODES** - eel or wire worms (extremely small)

	<p>1) <b>root-knot nematode</b> - bore into roots and cause the root to have a swollen, knotted appearance.</p>
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**MOLLUSK**

	<p>1) <b>snails</b> - with shells; chew on young plant parts, soft tissue; leave slime trails</p>
	<p>2) <b>slugs</b> - without shells; chew on young plant parts, soft tissue; leave slime trails.</p>

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**TYPES OF PESTS - DISEASES CAUSING PESTS AND WEEDS****DISEASE-CAUSING PESTS**

**pathogens** - microorganisms that invade, infect and cause damage to another living organism.

Type Microorganism	Appearance/Symptoms on Plant
<p>1) <b>fungi</b> long, multicellular filamentous microorganisms composed of membrane-bounded cells surrounded by cell walls</p>	<ul style="list-style-type: none"> <li>• moldy or powdery appearance on leaf</li> <li>• causes necrotic spots</li> </ul>
<p>2) <b>bacteria</b> usually rod shaped, single-celled (may form filaments) microorganisms composed of a membrane-bounded cell surrounded by a cell wall.</p>	<ul style="list-style-type: none"> <li>• causes soft, mushy, odorous regions on leaves or stems, "soft rot"</li> <li>• causes circular, ringed lesions</li> </ul>
<p>3) <b>virus</b> rod-shaped, spherical or crystalline-shaped microorganisms composed of strands of nucleic acids surrounded by a protein coat.</p>	<ul style="list-style-type: none"> <li>• causes yellow mosaic or mottling of leaves</li> </ul>
<p>4) <b>mycoplasma and spiroplasma</b> pleomorphic (means takes on shape of the organism it is in) microorganisms with membrane-bounded cells, but without cell walls.</p>	
<p>5) <b>rickettsia-like organisms</b> bacteria-like organisms that can only live inside living cells</p>	

**WEEDS** - any plant out of place.

**Cause Damage by:**

- 1) **competition**
- 2) **allelopathy**
- 3) **expense**
- 4) **disease and insect hosts**
- 5) **contaminate foods**
- 6) **poisonous**
- 7) **aesthetically undesirable**

8) **parasite**, ex. dodder, mistletoe

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