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
   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.

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

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

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

1) root-knot nematode - bore into roots and cause the root to have a swollen, knotted appearance.

**MOLLUSK**

1) snails - with shells; chew on young plant parts, soft tissue; leave slime trails

2) slugs - without shells; chew on young plant parts, soft tissue; leave slime trails.

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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.

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<th>Type Microorganism</th>
<th>Appearance/Symptoms on Plant</th>
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| 1) fungi           | moldy or powdery appearance on leaf  
|                    | causes necrotic spots          |
| 2) bacteria        | causes soft, mushy, odorous regions on leaves or stems, "soft rot" 
|                    | causes circular, ringed lesions |
| 3) virus           | causes yellow mosaic or mottling of leaves |
| 4) mycoplasma and spiroplasma | pleomorphic (means takes on shape of the organism it is in) microorganisms with membrane-bounded cells, but without cell walls.
| 5) rickettsia-like organisms | bacteria-like organisms that can only live inside living cells |

**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