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## 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)

- includes aphids, mealybugs, scale and whitefly listed below

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

**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.

| Type Microorganism | Appearance/Symptoms on Plant |
|---|---|
| **1) fungi**<br>long, multicellular filamentous microorganisms composed of membrane-bounded cells surrounded by cell walls | • moldy or powdery appearance on leaf<br>• causes necrotic spots |
| **2) bacteria**<br>usually rod shaped, single-celled (may form filaments) microorganisms composed of a membrane-bounded cell surrounded by a cell wall. | • causes soft, mushy, odorous regions on leaves or stems, "soft rot"<br>• causes circular, ringed lesions |
| **3) virus**<br>rod-shaped, spherical or crystalline-shaped microorganisms composed of strands of nucleic acids surrounded by a protein coat. | • causes yellow mosaic or mottling of leaves |
| **4) mycoplasma and spiroplasma**<br>pleomorphic (means takes on shape of the organism it is in) microorganisms with membrane-bounded cells, but without cell walls. | |
| **5) rickettsia-like organisms**<br>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

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