

CONTROLLING PESTS IN THE GARDEN

1. Integrated Pest Management (IPM)
 - A. Controlling (not eradicating) pest
 - B. First, do no harm: control using non-chemical means
 - C. Last resort is chemicals (pesticides) that target the pest
 - D. Goal: control pest selectively without damaging the environment
2. Healthy soil makes healthy plants
 - A. Feed the soil, not the plants
 - B. Soil is alive (bacteria, fungi, insect decomposers, worms, etc)
 - C. Soil amendments boost nutrients to help living things grow and reproduce, improve soil structure (clay begone!), and help water retention.
 - D. Pesticides: weaken plants, may kill non-target organisms, may contaminate groundwater, may cause resistance (pests thrive in presence of pesticide), disrupt the natural world
 - E. Healthy plants are better able to fight off insects and diseases
3. Diagnosing plant problems
 - A. Source of plant problem
 - i. Environmental (nonliving): moisture, light, pH, nutrient availability, soil texture, etc.
 - ii. Living things: insect pests, plant disease pathogens (bacteria, fungi, nematodes, viruses); some insects transmit disease
 - iii. **Symptoms:** evidence of pest damage, for example holes/chewed areas in a leaf
 - iv. **Signs:** indications that the pest was present, for example, insect poop or the insect itself can be seen
 - B. How do I know I have a gardening pest problem?
 - i. Scout the garden every day (journal, pictures)
 - ii. Know what a "normal" plant looks like
 - iii. Evidence of insects (eggs, chewing-sucking-boring damage, etc), look especially on the undersides of leaves

- iv. Look for disease = the "unhealthy" look, for example, leaves slightly yellow when they shouldn't be normally
- v. Most plants can tolerate some damage; how much damage can YOU tolerate?

C. You see damage...now what?

- i. Identify the culprit (take samples to help desk for ID): insect, disease, both together?
- ii. If pest is an insect, learn life cycle; who is doing the damage (caterpillar, adult?)
- iii. If you can't tolerate the damage done, control is needed.
- iv. Do no harm: first...try controlling the pest without pesticides; last resort is pesticides

D. Physical/mechanical pest control

- i. Handpick insects/egg masses and kill in soapy water
- ii. Water stream knocks insects from leaves/stems
- iii. Prune out diseased parts or remove diseased plants and discard (do not compost)
- iv. Hand pull/hoe weeds (take water and nutrients away from your plants)
- v. Add row covers to protect your plants by separating egg-laying female insect from its host plant
- vi. Use baits (slugs love beer), netting, fencing, tree bands
- vii. Keep tools clean and sharp; clean with 99% alcohol; dirty tools can be contaminated and transfer diseases

E. Cultural pest control

- i. Rotate garden vegetables
- ii. Interplanting (companion planting) so different pests have to look for plants of interest; no monoculture
- iii. Dispose of weeds/sites where insects can overwinter
- iv. Use plants known to be resistant to pest damage, for example, tomato plants resistant to fusarium wilt

- F. Biocontrol using organisms that normally feed on other animals/plants (bacteria, nematodes, beneficial insects and mites, birds, frogs, etc)
- i. Intersperse native with non-native plants to encourage biodiversity
 - ii. More plants means more places for nesting, shelter, food sources
 - iii. Add water (birdbath, fountain, etc)
- G. Pest control with pesticides
- i. All pesticides are toxic to some degree
 - ii. When you buy a pesticide, you must follow the label instructions. It is the law!
 - iii. Botanical insecticides are made from plant parts (for example Neem oil is made from Neem tree seeds),
 - iv. Synthetic pesticides are manufactured (for example, Sevin, a broad spectrum insecticide
 - v. Generally, botanical insecticides are less toxic and disappear from the environment more rapidly than synthetic pesticides.
 - vi. Pesticides should be a last resort, when other types of control do not manage the pest

For up-to-date information about pest controls, go to pubs.ext.vt.edu and insert 456-018 into the search box. This is the **2019 Pest Management Guide: Home Grounds and Animals**.