

# LESSON 7

## Weeds, Pests and Disease

Because you've created fertile, healthy soil for your garden, it will be a great place for all things to grow including weeds! What's a weed? Anything you don't want in your garden. Fortunately, there are a variety of ways to manage weed growth naturally. Plant pests and diseases will vary depending on your location, garden management, weather, and other factors. Early identification of weeds, pests, and diseases will be key in preventing, reducing and eliminating their impact on your garden. The earlier you identify garden problems, the quicker you can use appropriate natural management techniques and strategies to mitigate them.

### Learning Objectives

1. Understand the concept of Integrated Pest Management.
2. Know several methods that prevent and treat weed problems naturally.
3. Recognize common symptoms of pests and plant diseases.
4. Know several methods that prevent and treat pests and diseases naturally.
5. Know several human, written and online resources to use when problems arise.

### Integrated Pest Management (IPM)

IPM is a system for dealing with pest issues, the goal of which is to have the most effective pest control with the smallest harm to humans, the environment, and non-target organisms. IPM involves using a variety of management techniques that complement one another, rather than using just a single one. As a last resort it can involve the judicious use of some chemical pesticides. When using pesticides, it is very important (in fact it is the law) to follow the directions and not over-apply them with the hope that applying more has added benefit. Additional chemicals may leave the garden via the air, water, or on animals, creating pollution. While chemical treatments can be a part of IPM, VGSD discourages the use of all non-organic pest-management solutions.

### Weeds and Natural Weed Management

Weeds are simply any plant that is growing where we don't want it to grow. Weeding reduces competition for resources that are needed by our edible plants and also reduces habitat for pests.

1. First, get to know your weeds: Identifying weeds in your garden will tell you a lot about your garden and help you know which ones are problematic. Weeds will vary depending on your site. Use a resource such as those listed below to help identify weeds:

[www.landscape-america.com/problems/weeds/photo\\_id.html](http://www.landscape-america.com/problems/weeds/photo_id.html) or  
[www.ipm.ucdavis.edu/PMG/weeds\\_intro.html](http://www.ipm.ucdavis.edu/PMG/weeds_intro.html)

2. Armed with the knowledge about specific weeds, you can do prevention. Here are practices you can use to prevent weeds from sprouting:
  - a. *Mulching*: involves putting down a layer of organic material, such as chipped tree trimmings and coarsely chopped woody plants, (Get to know your local tree trimmers). Mulch on the surface of the soil and around plants to reduce light and space for weeds. Mulching is best used for preventing weeds but it can also be used to smother existing weeds.
  - b. *Targeted watering*: Watering plants directly at their base or at their leaf line minimizes the water available for weed seeds to germinate.
  - c. *Solarizing*: involves laying clear plastic tightly over the bed before planting it. When there is sufficient sunlight, the soil become heated and the weed seeds are killed. This process may also kill beneficial soil organisms, so before planting, be sure to remove the plastic and amend the soil with compost.
3. Dealing with weeds that do grow: It's unlikely that your prevention methods will be 100% effective, so you can use the following practices to deal with weeds that sprout:



- a. *Pulling/digging*: is the primary method for removing weeds that have already sprouted. Weeding is another reason to visit your garden frequently. Try to remove the entire weed including its roots.
- b. *Composting weeds*: Weeds can be a source of nitrogen in the compost pile, but you must be careful not to allow sprouting of weeds in the compost. Weeds should be composted only in a hot compost pile (135 degrees F or more). For particularly invasive weeds, such as Bermuda grass, compost them in a separate “weed” bin and take care where that compost is used.

### Common Pests and Diseases

Garden pests can be vertebrates (rodents, birds) or invertebrates (insects, snails/slugs, nematodes, fungi, viruses). With practice you will be able to identify the symptoms of various pests and plant diseases, which will help you treat them. The following are just a few common symptoms and their possible pest/disease causes:

1. Chewed/shredded leaves, fruit, etc indicate indicate that birds, rodents, rabbits, slugs, grasshoppers may be present.
2. Wilted plants indicate fungal disease (root rot or vascular wilt) and/or soil nematodes.
3. White powder on leaves is probably powdery mildew (fungal disease).
4. Curled or distorted leaves indicate a virus or aphids.

### Pest Prevention and Treatment

Below are some strategies to help prevent and treat common garden problems:

1. *Healthy soil*: Plants grown in a healthy, living soil will be better able to withstand and fight off damage by opportunistic pests and disease. Nutrient-rich soil grows nutrient-rich plants, which are more resistant to diseases and pests.
2. *Interplanting*: The planting of different plant species near each other can help prevent the spread of pests and diseases. The diversity of plants may confuse some pests and attract beneficial insects (see below).
3. *Reduced debris* Keeping beds clear of debris like woodpiles, reduces habitat for pests.
4. *Encouraging beneficials*: Beneficials are species, typically insects, that counteract a problem pest. A good example is the ladybug, which eats aphids. Planting plants that attract ladybugs, such as marigolds, clover, yarrow, and fennel, will help keep an aphid population in check. For more on beneficial insects, see [www.gardeninsects.com](http://www.gardeninsects.com).

5. *Barriers*: Physical barriers can prevent pests from reaching plants – for example, use fences and traps for larger pests, such as rodents. To block insects from young plants, cut apart plastic soda bottles and cups to make protective collars around plants. For snails and slugs, place copper screen around a plant; the copper reacts chemically with the snail’s slime to cause a shock. If you know there are burrowing pests, such as gophers, near your garden, using raised beds lined with hardware cloth or chicken wire will prevent them from entering the garden from below.
6. *Picking pests off plants*: For larger insect pests, simply pick them off plants when you see them – another reason to be in your garden daily. Be careful not to pick off beneficial insects- the larval ladybug looks very different from an adult ladybug, and it’s easy to mistake for a pest if you don’t know what it looks like.
7. *Sprays*: Organic sprays include solutions of soap, compost tea, chile oil, peppermint oil, and Neem oil. These can be sprayed on plants to suffocate pests and deter future infestations. Spray when pests are present but beneficials are not, since you want to protect the beneficial population. You can also find sprays of BT (*Bacillus thuringiensis*), which are naturally-occurring insecticidal bacteria. To treat powdery mildew, apply a spray of 2% milk to infected leaves to prevent further spread of the disease. Any pesticides, including those that are organic, should be used judiciously, carefully, and as instructed on packaging to avoid contaminating yourself and the garden’s environment.
8. *Disease-resistant plant varieties*: The best way to avoid viral and fungal diseases is to plant disease-resistant varieties. Some tomato varieties, for example, have letters appended to their names that indicate their resistance to certain diseases and pests: **V = verticillium wilt fungus**, **F = fusarium wilt fungus**, **N = root knot nematode**, and **T = tobacco mosaic virus**. For information on disease-resistant varieties, see <http://vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm>.



### ACTIVITY 1

**For those with some gardening experience, share stories of effective pest/disease prevention and treatment with the group.**



## References

1. Cornell University.  
"Vegetable MD Online."  
Available at: <http://vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm>  
*Lists disease-resistant varieties of many garden vegetables.*
2. Landscape-America.  
"Common Lawn and Landscape Photo Weed Identification."  
Available at: [www.landscape-america.com/problems/weeds/photo\\_id.html](http://www.landscape-america.com/problems/weeds/photo_id.html)  
*Photos of several common garden weeds with descriptions of growth and management.*
3. Garden Insects.  
"A Comprehensive Guide to Safe Biological Pest Control."  
Available at: [www.gardeninsects.com](http://www.gardeninsects.com)  
*A thorough list of common garden insect pests, with photos, and their most effective beneficial insect controls.*
4. University of California Cooperative Extension Online IPM Program.  
Available at: [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)
5. Vinje, E. Planet Natural.  
"Natural Born Pest Killers: Home remedies for pest control."  
Available at: [www.planetnatural.com/site/xdpy/kb/natural-pest-controls.html](http://www.planetnatural.com/site/xdpy/kb/natural-pest-controls.html)  
*Products and remedies for pest control.*

