

Nature, in general, takes pretty good care of itself. Healthy plants usually can ward off pest and disease attacks. Predatory insects and birds help control undesirable insect populations. An environmentally friendly approach to pest control is called Integrated Pest Management (IPM). IPM emphasizes :

- Using pest resistant plants
- Proper landscape management
- Natural enemies of pests
- The least toxic alternative if pesticides are needed

**Avoiding Pest Problems:**

Plan before you plant. It will take a lot of fertilizer and pesticides to protect plants weakened because they are planted in the wrong place. Planting the right plant in the right place will reduce these problems. If pest-resistant plant varieties are available, replace struggling plants with these types.

Use only minimal amounts of water and fertilizer. Too much water and fertilizer can cause excessive plant growth which is attractive to insects and diseases.

Mowing grass too short and pruning trees and shrubs too severely weakens them and invites pests and diseases.

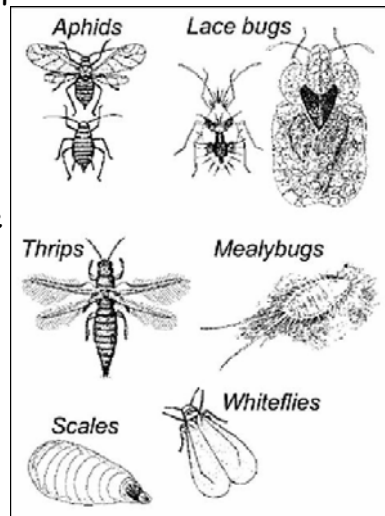
Mow at the proper height and remember that plants need leaves to produce food for the plant.

**Identify Pest Problems:**

Check plants regularly. Checking once a week will help you identify problems early, before they get out of control. Common pests to look for are aphids, mealy bugs, scales, white flies, thrips, spider mites and caterpillars. To identify small pests, hold a sheet of plain white paper under a small branch and give the branch a quick shake. Small pests will fall onto the paper. A 10X magnifying glass will help with identification. Look for scales and white fly larvae on the underside of plant leaves where they will attach themselves to the plant.

Insects can be classified based on the damage that occurs to plants.

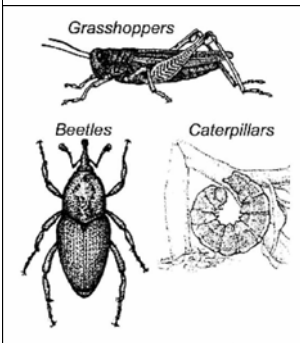
Insects that have beak-like mouthparts used for sucking plant juices include aphids, lacebugs, thrips, mealybugs, scales, and whiteflies.



Sooty mold on leaves indicates that piercing-sucking insects are present. While feeding, they secrete a sugary product called "honeydew." This honeydew encourages the growth of a black fungus called sooty mold. This fungus is harmless and will eventually wash away.

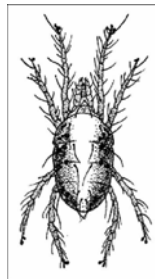
The presence of ants also indicates that pest insects are present. Ants feed on the honeydew and take care of the insects that produce it.

Another type of insects are foliage-feeders. These include caterpillars, beetles, grasshoppers and katydids.



These will consume entire leaves or eat holes out of leaves. Spider mites are in a separate category because they are not true insects but

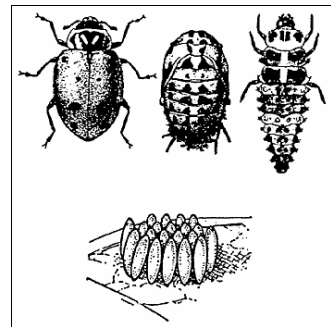
are more closely related to spiders and scorpions. Like aphids, they suck plant juices with piercing-sucking mouthparts.



If you notice extensive plant damage, but can't identify a great number of pests, it may mean that beneficial insects are already taking care of the pest problem. Lady bugs, lacewings, parasitic wasps, earwigs, and big-eyed bugs are beneficial insects that feed on pests.

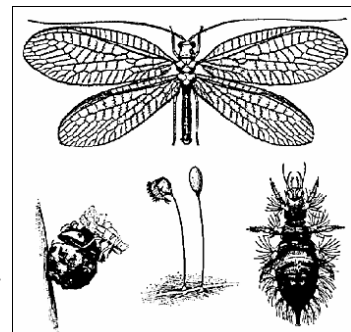
Tolerate some insect damage and leaf disease on plants because it is impossible to maintain a completely insect free yard. Remember that to have beneficial insects around, there must be some insect pests on which they can feed.

**Recognize Beneficial Insects:** It's important to know which insects are beneficial. There are many that will help keep pest populations in check but will be killed by traditional pesticides. For example, the picture on the right shows the adult, pupa, and larval stages of a common lady beetle



on the top row and below a lady beetle egg cluster. Adult lady beetles come in a variety of colors and often without spots. Larvae are often killed because of mistaken identity. Larvae are elongated and flattened, usually blackish or bluish with orange to yellow spots. Another beneficial is the lacewing pictured on the right. Adult lacewing is shown above, and from left to right, is a lacewing emerging from a pupa case, egg cases, and larva.

Adult lacewings occur in both green and brown and have pretty lacy wings. The larvae stage is



the beneficial stage and feed on an assortment of insects.

**Pest Controls:** Handpicking or spraying with water are effective controls for many insect pests. Many times problems can be reduced by pruning off the few affected leaves or plant parts.

Avoid spraying the entire yard. If pests are present, spray only the infected plants. Avoid using "broad-spectrum" pesticides. These products kill a wide range of insects, including beneficials. Avoid routine applications of pesticides. Spray only when there is a problem.

Safer alternatives for pesticides include:

- Insecticidal soaps--These are made from plant oils or animal fat and can be purchased at your local garden center. Soaps are effective on soft bodied insects like aphids, some scales, psyllids, whiteflies, mealybugs, thrips, and spider mites. Some plants are sensitive to soap sprays, especially those with hairy leaves. Spray according to label directions on affected plants and repeat when necessary.
- Horticultural oils--These are also available in garden stores. Look for ultra-fine or refined oils and make sure to follow label directions. Oils are effective at controlling insects

like aphids, mites, thrips, scales, mealybugs, and their eggs.

- *Bacillus thuringiensis* (Bt)--This is a bacteria that infects and controls caterpillars. It is available in garden stores in both liquid and powder forms.
- Neem or Neem Oil—Neem is extracted from seeds of the Neem tree. It acts as an insect-feeding deterrent and growth regulator. The insect is unable to molt to its next life stage. It is effective on leafminers, sweet potato whiteflies, thrips, loopers, caterpillars, mealybugs, and powdery mildew (oil formulation).

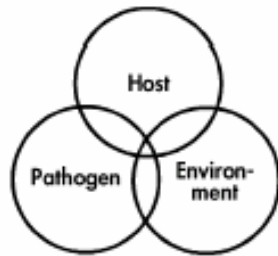
If you use a pest control company or landscape maintenance company, ask your contractor to:

- Inspect for pests rather than routinely applying sprays that may not be needed.
- Notify you before spraying chemicals in the yard.
- Determine if safer alternatives can be used instead of chemicals.
- Apply slow-release fertilizer and apply it only when fertilizer is needed.
- Avoid fertilizers containing weed killers or insecticides.
- Leave grass clippings on the lawn and use other yard waste as mulch or compost.

- Selectively prune shrubs rather than shear them. There will probably be an additional charge for this service.

### Plant Disease Management:

Plant diseases are caused by either fungi, bacteria or viruses. For a disease to occur, there must be a plant host, a disease pathogen, and a suitable environment.



Prevention is the most practical and effective means for homeowners to protect plants from diseases. Here is a list of avoidable conditions that favor plant disease:

- Plants not adapted to the site will be weak and more susceptible to disease. Do not plant full-sun plants like crape myrtle, roses and citrus in shady areas. Nor should you plant shade-loving plants like azaleas in full sun.
- Susceptible plants are those that are prone to disease problems. Roses, photinia, and Indian hawthorn are very susceptible to leaf spot diseases. *Pittosporum* is susceptible to both leaf spot diseases and root rot. Be selective when choosing varieties as some are more resistant to disease than others.

- Over watering/poor drainage is a common landscape problem which causes root diseases. Plants with root disease may appear to have nutritional deficiencies because they are unable to take up nutrients. Plants should be watered on an as-needed basis, at the first signs of wilt.
- Overhead irrigation should be avoided because wet leaves favor plant leaf diseases. If you must use overhead irrigation, water early in the day to decrease the time leaves are wet.
- Nutritional problems can be caused by too much fertilizer or a nutrient deficiency. In either case, plants are more susceptible to disease.
- Mechanical injury can promote plant diseases. Examples include mowing lawns too short or with a dull blade, heavy or improper pruning, or soil compaction.
- Lack of sanitation. When using tools around diseased plants, be sure to disinfect tools by dipping the cutting surfaces in a solution of one part bleach to four parts water.

Improper use of pesticides may damage plants. The concept of "more is better" is not true with pesticides. No pesticide should be applied in the heat of the day, in dry, windy conditions, or when plants are drought-stressed.

## Acknowledgments

The Florida Yardstick Workbook; ed. Billie Lofland; University of Florida Cooperative Extension Service; Bul. 325.

A Guide to Environmentally Friendly Landscaping, Florida Yards and Neighborhoods Handbook; Allen Garner, John Stevely, et.al.; University of Florida Cooperative Extension Service; 1996.

University of Florida Publications:

- Natural Products for Insect Pest Management; Eileen A Buss and Sydney G. Park-Brown; ENY 350, January 2002.
- Natural Enemies and Biological Control, Hugh A. Smith and John L. Capinera, ENY-822, July 2000.
- Landscape Integrated Pest Management, C.W. Scherer, P.G. Koehler, and D.E. Short; ENY-298. March 2000.
- Homeowner's Guide to Integrated Plant Disease Management; ENY-295. July 1997.

Web site for the University of Florida, Institute of Food and Agricultural Sciences <http://edis.ifas.ufl.edu>