THE NATURAL LAWN & GARDEN

Healthy Landscapes for a Healthy Environment

Natural Pest, Weed & Disease Control

2013

Why Manage Your Garden Naturally?

Insects, spiders and other crawling or flying creatures are a vital part of healthy gardens. Most perform important jobs like pollinating flowers, recycling nutrients and eating pests. In fact, less than 1 percent of garden insects actually damage plants. Unfortunately, many pesticides used to control problem pests and weeds are also toxic to beneficial garden life—and may harm people, pets, salmon and other wildlife.

Follow These Basic Steps to Natural Pest, Weed and Disease Control

- **Create a healthy garden to stop pest problems before they start.** Healthy plants and soils not only resist pests and diseases, they also attract and feed beneficial garden life.
- **Identify pests before you spray, stomp or squash.** When you see damaged plants or what appear to be pests, use the Natural Pest Control Resources on pages 10 and 11 to identify the "suspects" first. What you think is a pest may actually be a beneficial insect!
- **Learn to live with a few insects.** Most bugs in your garden are actually helpful. Trying to kill them all eliminates the beneficial insects, too, making pest problems worse.
- **Use the least toxic pest controls available.** You can often control pests with traps, barriers, hand-picking or removal of infested plant parts. These methods do not harm beneficial garden life or the environment. Find out which least toxic methods work best against the pests in your garden. Use pesticides as a last resort and always closely follow the label directions. "Target the pest, protect the rest." To learn which products are least toxic, visit www.growsmartgrowsafe.org.

Start With Prevention: Create A Healthy Garden

- **Build healthy soil to grow healthy plants.** Amend soil with compost and place mulch over bare soil to grow vigorous, pest-resistant plants. See the *Growing Healthy Soil* guide* for more details and mulch options.
- **Plant right.** Place each plant in the sun and soil conditions it prefers. Select varieties known to thrive in your garden's conditions and that resist pest and disease problems. See the *Choosing the Right Plants* guide* and *The Plant List* for help in selecting plants ideal for each spot in your garden.
- **Give your plants some space.** Good air circulation can prevent or reduce many disease and pest problems. Space plants so they have plenty of room to grow. Remove some if they become too crowded.
- **Water wisely.** Overwatering and underwatering are two of the most common causes of plant problems. Observe plants and check the soil before and after watering to make sure plants get the water they need when they need it. To prevent diseases that grow on wet leaves, water early in the day or use soaker hoses. For more details, see the *Smart Watering* guide.*
- **Clean up.** Remove weeds and yard debris that can harbor pests and disease. Fallen leaves and fruit from diseased plants should be put in curbside yard-waste collection containers—not in home compost piles, ravines, forested areas, streams or lakes.
- **Diversify and rotate annual crops.** Growing a variety of plants reduces pest outbreaks, as well as attracts pest-eating insects and birds. Do not plant the same type of vegetables in the same spot each year; crop rotation prevents pests and diseases from building up in the soil.

* Refer to the back of this guide for a list of all Natural Lawn & Garden guides and how to obtain them.

Beneficial insect: Lady beetle larva

Insect pest: Aphids

When Is It A Pest?

- **Pest** refers to an insect, animal, plant or microorganism that causes problems in the garden.
- **Beneficials** are organisms in the air, on the ground or in the soil that do good things for your garden like pollinating flowers, feeding on insect pests or improving soil.
- **Some pests are also beneficials.** For example, although paper wasps can be painful to humans, they are predators of garden pests. Think twice before using pesticides.

What To Do If A Pest Problem Develops

Step 1: Identify Pests When A Problem Arises

Between 60 to 70 percent of all plant problems are not caused by insects or diseases. To be sure you are treating the real problem, seek help to properly identify and diagnose the cause. Local diagnostic resources include Master Gardeners, (425) 357-6010, and certified nursery or landscape professionals. Refer to resources on pages 10 and 11.

Step 2: Use Physical Controls First

Many pests can be kept away from plants with barriers or traps, or controlled by simply removing infested plant parts. These controls generally have no adverse impact on beneficial garden life, people or the environment.

Washing aphids from underside of leaf

◆ Removal

Pests and diseased plant parts can be picked, washed or pruned off the plants to control infestations. In fact, pulling weeds is a natural pest control!

— **Handpicking** can be effective for large pests like cabbage loopers, tomato hornworms, slugs and snails.

— **Pruning out infestations** of tent caterpillars is effective on a small scale. Control leaf miners on beets or chard by picking off infected leaves. Put infestations in curbside yard waste collection containers—not in home compost piles, which do not get hot enough to destroy pests.

— **Washing aphids off plants** with a strong spray of water from a hose can reduce damage. Repeated washings may be required, as this process does not kill the aphids, but knocks most off the plant.

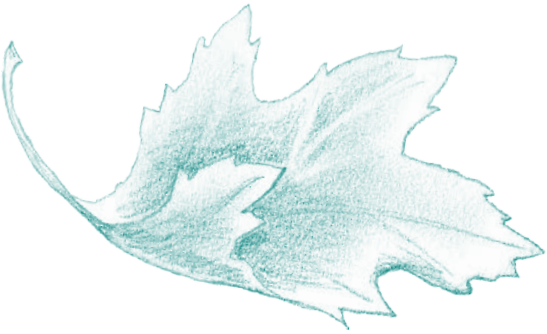
Drowning slugs in beer traps

◆ Traps

It is possible to trap enough pests like moths and slugs to keep them under control. You can also use traps for monitoring pest numbers to determine when controls may be necessary. Two simple and effective pest traps are:

— **Yellow, blue or red sticky traps** attract and trap insects that are drawn to specific colors. For example, yellow attracts white fly and fungus gnats, blue attracts flea beetles, and red attracts apple maggot flies. Check the product label for a list of pests most attracted to the sticky trap color.

— **Slug traps** drown slugs in beer or in a mixture of yeast and water.



◆ Repellents

A variety of commercial preparations are registered for use in Washington. Most are used to discourage animals. Some gardeners find success with repellents, while some do not.

— **Garlic oil and other extracts** are used to repel a variety of pests.

◆ Barriers

It is often practical to physically keep pests away from plants. Barriers range from 2-inch cardboard "collars" around plants for keeping cutworms away to 8-foot fences for excluding deer.

— **Floating row covers** are lightweight fabrics that let light, air and water reach plants, while keeping pests away—they are useful for pests like rust flies on carrots, leaf miners on spinach, and root maggots on cabbage, broccoli and cauliflower. Be sure to use crop rotation techniques. Bury edges of the row cover to keep flying insects out.

— **Mesh netting** keeps birds away from berries and small fruit trees.

— **A band of sticky material around tree trunks** stops crawling insects from climbing up to cause damage.

Protecting a crop with a floating row cover

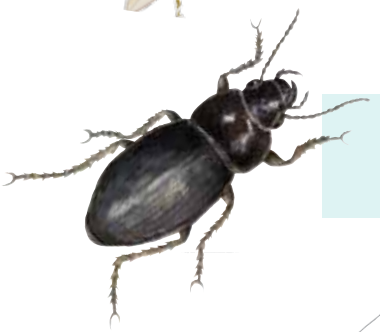
Meet The Beneficials!

Learn to identify beneficial insects that are already hard at work in your garden. View the Good Bugs Guide at www.GrowSmartGrowSafe.org/BugsGuide.aspx.

Attract beneficials to your garden by planting diverse plants, building healthy soil and avoiding pesticide use. Spraying any pesticide may kill more beneficials than pests. Think twice before you spray.

Lady beetle larvae and adults feed on soft-bodied insects such as aphids, mealybugs, scale insects and spider mites, as well as insect eggs.

Yellow jackets are effective predators of many garden pests. However, traps may be necessary if they pose a threat to people or pets.



Ground beetles eat slug eggs and young, plus other pests.

Lacewings and their alligator-like larvae eat aphids, scales, mites, caterpillars and other pests.

Centipedes may look scary, but they feed on slugs and a variety of small insect pests.

Step 3: Use Least Toxic Pesticides When Physical Controls Don't Work

The pesticides listed below have relatively low toxicities and break down quickly when exposed to sunlight or soil microorganisms. They are the least likely to have adverse effects. However, even these pesticides can be toxic to beneficial garden life, people, pets and other animals—especially fish. They should be used carefully and kept out of streams, lakes and Puget Sound. Refer to resources on pages 10 and 11. **Always follow label instructions.**

Soaps, Oils And Minerals

- **Horticultural oils** smother mites, aphids and their eggs, scales, leaf miners, mealybugs and many other pests. Check before spraying, as oils can kill beneficials that are present.
- **Horticultural soaps** dry out aphids, white flies, earwigs and other soft-bodied insects. They must be sprayed directly onto the pests to work, so repeat applications may be necessary. There are registered soap-based fungicides, herbicides and moss-control products.
- **Sulfur products** control many fungal diseases such as scab, rust, leaf curl and powdery mildew without harming most animals and beneficials.
- **Potassium biocarbonate** is registered to control fungal diseases on roses and some edible plants.
- **Iron-phosphate slug baits** are considered less toxic than other slug baits.

Botanicals

These plant-derived insecticides degrade quickly in the sun or soil. However, most are initially toxic to people, animals, fish and beneficial garden life. *Use cautiously and follow label directions closely, just as when applying synthetic pesticides.*

- **Neem oil** kills and disrupts the feeding and mating of many insects, including some beneficials. Also an effective fungicide, neem oil is the botanical that is least toxic to people, animals, birds and fish.
- **Pyrethrins** can be effective against many insects, particularly those with soft bodies. However, they are quite toxic to beneficial insects and to fish. Do not use them where they may get into water. Use caution to prevent beneficial insect exposure. *These pesticides should only be used as a last resort.*

Biocontrols

- **Bacillus thuringiensis (Bt)** is a common, commercially available bacterium registered to control caterpillar pests, such as cutworms, tent caterpillars and loopers. It is not effective against sawfly caterpillars. Bt is not toxic to people, animals or fish.
- **Predatory nematodes** kill a wide variety of pests, including cutworms, armyworms, root maggots, crane fly larvae, root weevil larvae and other soil-dwelling pests. Proper soil temperature and moisture are required for nematodes to be effective.
- **Beneficial insects** like ladybugs and ground beetles are typically abundant in a healthy and diverse garden where pesticides are not used. Beneficials, such as aphid predators and lacewings, can be purchased and released.

Step 4: Use Synthetic Pesticides Only As A Last Resort

When physical and least toxic controls fail to control a pest, other pesticides may be used as a final resort. But first, consider your pest problem. Is it the result of poor plant placement? Is it likely to recur after pesticide treatment? Keep in mind that scientists have found pesticides every time they test local streams, some at high enough levels to harm fish and what they eat. Studies show that when pesticides mix in waterways, the resulting combination disrupts the biology and physiology of fish and other aquatic organisms.

- **Don't use services that spray insecticides or herbicides on a prescheduled plan.** Preventive sprays can disrupt natural controls and may do more harm than good. Fungicides are an exception because they only work when applied prior to the appearance of the problem—use the least toxic fungicides and only on plants which have been infected in previous years.
- **Look for the least toxic pesticide.**
  - — Consult www.growsmartgrowsafe.org for help identifying the least toxic pesticides for your pest problem.
  - — Most pesticide product labels include a signal word that describes its acute (short-term) toxicity. Of the three levels of homeowner products, those with "DANGER" are most toxic, "WARNING" is moderately toxic, and "CAUTION" is lower in toxicity. The only pesticide products that are not required by the U.S. Environmental Protection Agency (EPA) to display a signal word are those that fall into the lowest toxicity category by all routes of exposure.
- **Buy only as much as you need**. Unused pesticides are dangerous to store or dispose of, and expensive for local governments to dispose of.
- **Select ready-to-use (RTU) products,** which eliminate the need to dilute and mix pesticides or purchase special equipment.
- **Don't use broad-spectrum insecticides** that are likely to kill beneficial insects along with the pests. Their use can also result in a rebound of pest populations worse than before.
- **Avoid "weed and feed" and other pesticides that are broadcast over the entire yard.** Instead, spot apply the least toxic product, only where you have a pest or weed. If fertilizer is needed, apply it separately.
- **Read and follow label directions carefully.**
  - — Use pesticide only on the plants and pests listed on the label.
  - — Apply exactly according to label directions and heed all warnings.
  - — Wear specified protective clothing and equipment.
  - — Keep children and pets off application areas for the specified time period.
  - — Store and dispose of unused pesticides and containers properly.
- **Apply only when and where pests are present.** Timing is critical with all pest control. Most pesticides should not be used as a preventative, except fungicidal sprays.
- **Dispose of unused pesticides and containers properly.** Empty containers should be disposed of in your garbage according to label instructions. Dispose of unused pesticides at the Snohomish County Household Hazardous Waste Drop-Off Station; see resources on page 11 for more information.

Have You Seen These "Noxious" Weeds?

There are a few non-native "noxious weeds" that property owners are required to control by Washington State law to prevent their spread. Check the Snohomish County noxious weed listings at www.snoco.org and search for "noxious weeds."

Giant Hogweed

What About Weeds?

A "weed" is simply a plant in the wrong place. Some weeds compete with desirable plants; some spread invasively.

- **Accept a few weeds in your lawn.** Target the problem weeds, and leave the others. For tips on maintaining a dense, healthy lawn that crowds out weeds, refer to the *Natural Lawn Care* guide.*
- **Prevention: Don't give weeds a chance.** Weeds thrive in bare soil and neglected garden areas. Cover bare soil areas with mulch. Plant a spreading ground cover to outcompete weeds, or smother weeds with cardboard or newspapers covered with lots of mulch. See the *Growing Healthy Soils* guide* for more information on mulches.
- **Physical control: Be a control freak with problem weeds.** A single weed flower can produce thousands of seeds. To prevent future infestations, remove weeds before they go to seed.
  - — **Cultivating with a hoe** works well on young or shallow-rooted weeds.
  - — **Long-handled, pincer-type weed pullers** work great for weeds with taproots like dandelion and thistle, especially when soil is moist.
  - — **Propane weeding torches** scorch and kill most weeds without damaging plants around them; repeated flame treatment may be needed for tough weeds. Be aware of fire hazards when using torches, as well as the potential to burn your feet. Spring and fall, when the ground is moist and weeds have just sprouted, are the safest and most effective seasons to use a torch.

Torches work on weeds in cracks or gravel

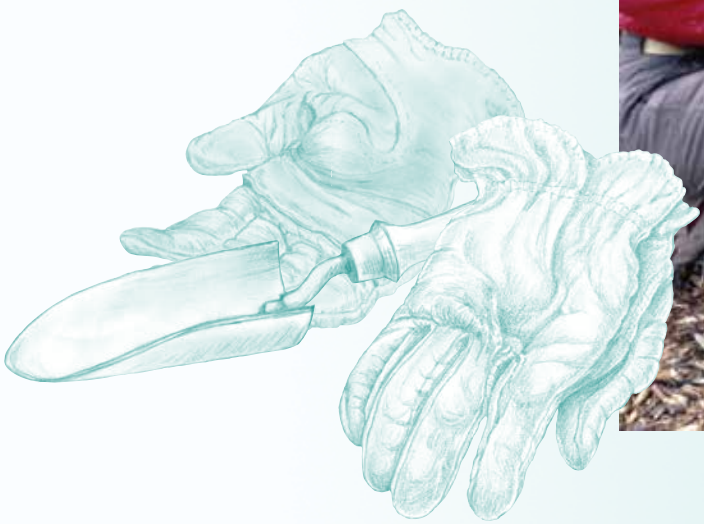
Using a weed puller

- **Least toxic controls: corn gluten, herbicidal soaps and citric acid.** Herbicides with low toxicity to beneficial garden life, people and wildlife include corn gluten (a milling byproduct), herbicidal soaps and products containing citric acid in combination with clove oil.
  - — **Corn gluten** prevents germination of weed seeds and adds nitrogen to the soil. Too much corn gluten results in over-fertilization which could contaminate water supplies. It also can attract rats. Corn gluten's effect is short-lived, so applications must be carefully timed to coincide with weed seed germination and dry weather.
  - — **Herbicidal soaps and citric acid products** damage leaf cells and thus dry out plants. However, tough weeds resist these herbicides or resprout from roots. Reapplication may be necessary.
- **The last resort: Spot apply synthetic herbicides.** When extreme weed problems require use of synthetic chemical herbicides, carefully apply them—only as directed on the label. Only treat the weed. Do not use broadcast products such as "weed and feed" or pre-emergents, as these are more likely to run off into streams and lakes and end up in Puget Sound. Carefully time herbicide use to avoid washing it off with rain or irrigation.

If you are applying an herbicide on a regular basis, there is probably a landscape design or soil problem that needs to be addressed.

Spot apply the least toxic herbicide

"Target the pest, protect the rest."
— Sharon Collman
WSU Extension Educator



Spreading mulch to prevent weeds

Natural Pest Control Resources

Choosing Safer Pesticides and Garden Products

- **Grow Smart, Grow Safe.** A regional, online consumer guide on pest controls and fertilizers. Includes product rating charts from lowest to highest hazards and ways to manage gardens naturally. Visit www.growsmartgrowsafe.org.
- **National Pesticide Information Center (NPIC).** Provides science-based information by professional toxicologists to enable people to make informed decisions. Includes fact sheets on pests and pesticide active ingredients, toxicity, safety, exposure and environmental effects. Call (800) 858-7378 or visit www.npic.orst.edu.

WSU Snohomish County Extension Resources And Services

- **Master Gardener Hotline.** Call (425) 357-6010 or email MG.help@wsu.edu.
- **Master Gardener Clinics.** Email or visit a clinic around the county to identify and diagnose your pest problem. For clinic locations, call (425) 357-6010, email MG.help@wsu.edu or visit http://snohomish.wsu.edu.
- **Master Gardener Demonstration Gardens.** See organic techniques for growing vegetables, fruit and landscape plants, and to learn about pest-resistant varieties. For locations, descriptions and directions, visit http://snohomish.wsu.edu/mg/gardemo.htm.
- **Local WSU Resources.** Workshops, events, pest alerts, Bugs & Blights newsletters and timely information on pests and beneficials. Visit http://snohomish.wsu.edu/garden.htm.

WSU Extension Resources

- **Hortsense.** Home gardener information for managing garden plant problems with Integrated Pest Management (IPM) techniques. http://pep.wsu.edu/hortsense/
- **Pestsense.** Information on managing common indoor pest problems with IPM – includes yellow jacket, mosquito, ant and termite problems. http://pep.wsu.edu/pestsense/
- **Publications.** Growing healthy plants and managing pests in Washington. Order online at http://pubs.wsu.edu, or call (800) 723-1763.
  - **Home gardening bulletins:** Search by topic; some available as free download.
  - **Reference books:** *Landscape Plant Problems: A Pictorial Diagnostic Manual,* and *Pacific NW Landscape Integrated Pest Management Manual.*
  - **Diagnostic handbooks:** *PNW Insect Management Handbook, PNW Plant Disease Management Handbook,* and *PNW Weed Management Handbook.*

Books For Gardeners

- ***Rodale Pest and Disease Problem Solver*** by Gilkeson, Peirce & Smith; Rodale Press, 2000. Photos and descriptions of many common pest and disease problems, plus less toxic ways to prevent and manage them.
- ***Rodale's Color Handbook of Garden Insects*** by Anna Carr; Rodale Press, 1983. Photos for identifying pests and beneficial insects, with recommended organic controls for many pests.
- ***Sunset Western Garden Problem Solver.*** Sunset Books Inc, 2003. Photos and descriptions of common pest, disease and weed problems, plus less toxic ways to prevent and manage them.
- ***The Gardener's Guide to Common Sense Pest Control*** by Olkowski, Daar & Olkowski; Taunton Press, 2013. Least toxic solutions for home, garden, pets and community.
- ***The Maritime Northwest Garden Guide*** by Elliott & Peterson. Tilth, 2000. Planning calendar for year-round organic gardening.
- ***What's Wrong With My Plant?*** by Deardorff & Wadsworth. TimberPress, 2009. A visual guide to easy diagnosis and organic remedies.

Other Resources

- **Landscape Professionals.** Many landscape and nursery professionals are skilled in environmentally friendly landscaping. Find them at www.savingwater.org by clicking on "Outside" and scrolling down to "Choosing a Landscape Professional," or call (206) 633-0224 and ask for the brochure *How to Choose a Landscape Company*.
  - — **Washington Association of Landscape Professionals**, www.walp.org
  - — **Association of Professional Landscape Designers, Washington Chapter**, www.apldwa.org
  - — **Washington State Nursery and Landscape Association**, www.wsnla.org
- **Seattle Tilth.** To learn more about organic gardening classes or to get directions to demonstration gardens, call (206) 633-0451, or visit www.seattletilth.org.

Pesticide Disposal And Emergencies

- **Household Hazards Line.** For information on pesticide disposal, including the days, hours and location of the Snohomish County Household Hazardous Waste Drop-Off Station, call (425) 388-6050.
- **Poison Center Hotline.** In case of pesticide poisoning, call (800) 222-1222, or just call 911.
- **Washington State Department of Agriculture.** If you have a concern about a pesticide application or want to report a violation, call WSDA at (877) 301-4555.

* Refer to the back of this guide for a list of all Natural Lawn & Garden guides and how to obtain them.

Photographs by Peggy Campbell, Sharon Collman, Joanne Jewell and Carl Woestwin; Illustrations by Wilda Boyd.

To Request A Natural Lawn & Garden Guide, Contact:

- **Snohomish Conservation District**
  (425) 335-5634, ext. 4, www.snohomishcd.org

- **Snohomish County Public Works,**
  Surface Water Management Division
  (425) 388-3464, www.naturalyard.surfacewater.info

- **WSU Snohomish County Extension Master Gardeners**
  (425) 357-6010, www.snohomish.wsu.edu

The Natural Lawn & Garden Series

- Growing Healthy Soil
- Choosing the Right Plants
- The Plant List
- Smart Watering
- Composting at Home
- Natural Pest, Weed & Disease Control
- Natural Lawn Care
- Natural Yard Care (summary)

For Additional Information Visit:

www.naturalyardcare.info

Snohomish Conservation District

Washington State University Snohomish County Extension

Puget Sound Starts Here

Snohomish County Public Works Surface Water Management

Working together for people, streams & fish

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