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 diseases. 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.

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**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.

◆ 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.

◆ 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.

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/GoodBugGuide.

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.

Protecting a crop with a floating row cover
**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**

- **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 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. Visit www.snohomishcountywa.gov and search “noxious weeds” to view the Snohomish County noxious weed list.

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 groundcover 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.
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 that contain 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.

— **H**erbicidal 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.

“Target the pest, protect the rest.”
— Sharon Collman
WSU Extension Educator
**Natural Pest Control Resources**

**Choosing Safer Pesticides and Garden Products**

- **Grow Smart, Grow Safe.** An online consumer guide to lawn and garden products. Features product ratings, from lowest to highest hazard, based on active ingredient(s). Includes methods to manage garden challenges naturally. Visit [www.growsmartgrowsafe.org](http://www.growsmartgrowsafe.org).


- **National Pesticide Information Center (NPIC).** NPIC provides objective, science-based information about pesticides and pesticide-related topics to enable people to make informed decisions. Call 800-858-7378 or visit [www.npic.orst.edu](http://www.npic.orst.edu).

**WSU Snohomish County Extension Resources and Services**

- **Master Gardener Hotline & Diagnostic Clinics.** Email, call or visit clinic locations around the county to ask your garden questions and identify and diagnose garden challenges.
  - Visit (Monday-Friday): Willis Tucker Park Office, 6705 Puget Park Dr, Snohomish.
  - Email (year-round): snocomg@gmail.com.
  - Call (April-September): 425-357-6010.

- **Master Gardener Demonstration Gardens.** Demonstrating natural and organic gardening methods and using pest- and disease-resistant plant varieties.
  - Vegetables, fruit and flowers – Jennings Park, 6915 Armar Rd, Marysville.
  - Ornamental and native plants – Evergreen Arboretum & Gardens, 145 Alverson Blvd, Everett.

- **Workshops, Events, Pest Alerts.** Visit [http://snohomish.wsu.edu/garden](http://snohomish.wsu.edu/garden).

**WSU Extension Resources**

- **Hortsense.** Informational fact sheets on managing common garden weeds, pests and diseases using Integrated Pest Management (IPM) techniques. Visit [http://hortsense.wsu.edu](http://hortsense.wsu.edu).


- **Publications.** Home garden bulletins on growing healthy plants and managing pests in Washington. Search by topic; many are available as a free download. Visit [http://pubs.extension.wsu.edu/gardening](http://pubs.extension.wsu.edu/gardening), call 800-723-1763 or email ext.pubs@wsu.edu.
BOOKS FOR GARDENERS
◆ Rodale’s Pest and Disease Problem Solver by Gilkeson, Peirce & Smith; Rodale Press, 2000. Photos and descriptions of common pests and diseases. Least toxic ways to prevent and manage them.

OTHER RESOURCES
◆ Landscape Professionals. Many landscape and nursery professionals are skilled in environmentally friendly landscaping. Find “Choosing a Nursery or Landscaper” at www.savingwater.org under Lawn & Garden.
◆ Tilth Alliance. Take organic gardening classes or visit demonstration gardens. Call 206-633-0451 or visit www.tilthalliance.org.

PESTICIDE DISPOSAL AND EMERGENCIES
◆ Household Hazardous Waste Drop-Off Station, 3434 McDougall Ave, Everett. Free disposal for county residential customers. For more information, visit www.snohomishcountywa.gov/477.
◆ Washington Poison Center. 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 360-902-1800.

* Refer to the back of this guide for a list of all Natural Lawn & Garden guides and how to obtain them.
5 Steps to Natural Yard Care
Choosing the Right Plants
Composting at Home
Growing Food At Home
Growing Healthy Soil
Natural Lawn Care
Natural Pest, Weed & Disease Control
Smart Watering
The Plant List

Available in Spanish:
El Cuidado Natural del Jardín
Cultivo de Hortalizas en Casa

TO REQUEST A NATURAL LAWN & GARDEN GUIDE, CONTACT:

◆ Snohomish Conservation District
  425-335-5634, www.snohomishcd.org

◆ Snohomish County Conservation & Natural Resources
  Surface Water Management

◆ WSU Snohomish County Master Gardeners
  6705 Puget Park Dr, Snohomish
  snoomg@gmail.com (year-round)
  425-357-6010 (April-September)
  www.snohomish.wsu.edu

FOR ADDITIONAL INFORMATION, VISIT:
www.naturalyardcare.org

NATURAL LAWN & GARDEN GUIDES:

Translations, interpretations, and ADA accommodations
are available upon request. Call 425-388-3464. (TTY: 711).

Se encuentran disponibles traducciones, interpretaciones
y adaptaciones de conformidad con la ADA a pedido.
425-388-3464 (TTY: 711) (Spanish)

요청 시, 통번역 서비스 및 ADA 지원을 받을 수 있습니다. 전화번호: 425-388-3464. (TTY:711) (Korean)

Bản dịch, dịch vụ thông dịch và hình thức điều chỉnh
ADA được cung cấp theo yêu cầu. 425-388-3464 (TTY: 711) (Vietnamese)

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