Think Twice Before Using Pesticides

Controlling pests, weeds, and diseases naturally can make your home and yard healthier and safer while reducing negative ecological impacts.

Sustainable landscaping at the Kulshan Bird & Butterfly Demonstration Garden

Many people want a beautiful pest- and weed-free garden. However, many chemicals and methods used to control garden pests and weeds can be unhealthy for people and pets; toxic to birds, bees, fish, and beneficial insects; and damaging to the environment.

- In studies conducted between 1998 and 2003, the US Geological Survey found 39 pesticides in King County streams.
- A recent study from the National Oceanic Atmospheric Administration and WSU found that mixtures of pesticides commonly found in salmon habitats can injure or kill salmon, even though concentrations of any one chemical seem to be safe.
- Scientific studies show that pesticides applied to the lawn can be tracked into the home and found in carpet dust and on tables, window sills and other surfaces.

Integrated pest management

Integrated pest management (IPM) is an approach to pest control that combines biological, cultural (plant care) and chemical methods to prevent unacceptable levels of damage to plants. IPM uses ecologically-sound management practices to determine when intervention is necessary and what approach might work best. IPM can reduce pesticide use in the landscape by at least 50% without sacrificing the appearance or productivity of plants.

1. Prevent problems

A good pest control program begins by preventing the problems that occur when pests become out of control. To prevent problems:

- **Select healthy plants** that are suited to the local climate and are resistant to pests and diseases common in this area.
- **Plant the right plant in the right location** (sun, shade, wet, dry, hot, cool, etc).
- **Practice proper planting** techniques and allow plants enough space to grow to their mature size.
- **Rotate annual plants** so that the same foods and flowers are not grown in the same places each year.
- **Learn how to properly care for different plants** to ensure that they thrive.
- **Water through plants' root zones** and let the top inch or two of soil dry out between watering sessions.
- **Keep your yard free of diseased leaves and fallen tree fruit,** and prune out diseased limbs.

To learn more about good natural plant and yard care practices, read the rest of the Natural Yard Care brochure series available at your local jurisdiction or on their website.

The IPM Process

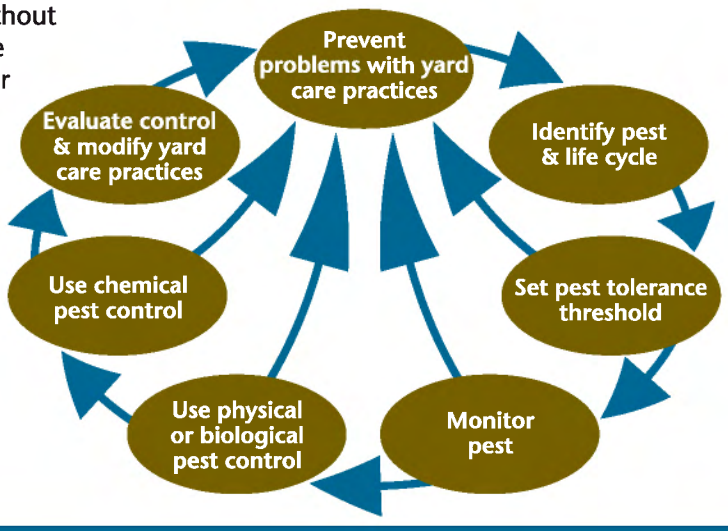


Photo: Washington State University

Aphids suck nutrients and moisture from plants.

Photo: Oregon State University

Root weevil adults eat notches along leaf edges. Larvae feed on roots.

Types of pest controls

Cultural: Improve plant health and decrease the impact of pests by improving soil; providing adequate light, water, and nutrients and planting complementary plants.

Mechanical: Use traps, barriers, hand picking, and even sounds to control pests.

Biological: Use beneficial insects and natural predators to control pests.

Chemical: Use chemicals to kill pests only as a last resort.

2. Inspect & identify pests

Regularly inspect your yard for pests to find problems while they are still small and easier to manage.

When you find a pest, you need to properly identify the weed, insect or disease so you can determine what action to take. Most insects are beneficial or non-harmful and what initially looks like a pest may simply be a beneficial insect in another life stage.

Washington State University's Hortsense Web site at **pep.wsu.edu/hortsense** and other resources listed on the back of this brochure can be useful for identifying specific weeds, insects and diseases.

3. Set pest tolerance thresholds

After you identify a pest, set tolerance thresholds and management objectives. Consider the following questions:

What are your objectives in managing pests? Objectives may include protecting children's and/or pet health from pest problems and excessive or unnecessary pesticide use; maintaining an aesthetically-pleasing yard; or protecting wildlife and water resources from pesticides.

How much damage or how many weeds can you tolerate? Is it OK if damage is confined to one plant in your yard? Is the pest damaging or threatening anything else in your yard? The answers to these questions depend on the specific insect, disease, or weed you are managing. For example, you may be able to tolerate a few aphids on your roses, but decide to spray them with an insecticidal soap if they get to a too damaging level. Researching recommended action thresholds for particular pests is important.

Can a plant outgrow the damage you have found? Sometimes no intervention is necessary and nature will correct the problem.

What is the natural threshold for a specific pest? Many pest populations reach a peak and then naturally level off or decline, making control after this peak unnecessary.

4. Monitor pests

Monitor pest levels and note whether the pest:

- Continues to cause a problem;
- Increases or decreases in number; or
- Spreads to other plants.

When the pest population exceeds your tolerance threshold, take action.

Monitoring can help you learn where the pest is in its life cycle so that you can make wise control decisions. Some pests are more susceptible to specific control measures at particular points in their life cycle. Specific weather conditions might also influence the pest. Simply waiting for a weather change may be the only control you need.

5. Use physical, mechanical, and biological controls

Many pests can be kept away by using traps or barriers, or by physically removing them and infected plant parts.

- **Handpicking** can be effective for large pests like cabbage loopers and slugs.
- **Pruning** out infestations can be effective on a small scale.
- **Washing** aphids off the underside of leaves can reduce damage.
- **Barriers** like floating row covers are lightweight fabrics that let light, air, and water reach plants while keeping pests away.
- **Long-handled weed pullers** can be used to control dandelions and other tap-rooted weeds in lawns or landscape beds.

Photo: Washington State University

***Ladybugs** feed on soft-bodied insects such as aphids, mealybugs, scale insects and spider mites.*

Photo: Oregon State University

***Lacewings** eat aphids, scales, mites, caterpillars and other pests.*

Photo: Washington State University

***Ground beetles** eat slug eggs and babies and other soil-dwelling pests.*

Photo: Washington State University

***Yellow jackets** are predators of many garden pests.*

Beneficial insects

Healthy landscapes and gardens have natural populations of beneficial organisms, including beneficial insects, parasites and pathogens that naturally target pests. Beneficial insects may include spiders, mites, centipedes, nematodes, lacewings, lady beetles (ladybugs), rove beetles, and parasitic wasps. Think about managing *for* beneficial species, instead of against the pests.

Plan your garden to feed beneficial insects:

- Choose a variety of plants that will bloom as many months of the year as possible in order to provide a good pollen source for beneficial insects when pest populations are low.
- Plant plants in the cabbage, carrot and sunflower family.
- Leave leaf debris in beds for beneficial insects to overwinter (remove any diseased leaves).

Finally, don't forget the birds – trees, shrubs with berries, birdhouses, and water features all encourage birds, which also eat insects, to visit your yard.

6. Use least toxic pesticides

"Least toxic" pesticides have a low toxicity or degrade quickly when exposed to sunlight or soil. However, even these pesticides can be toxic to beneficial garden life, people, pets, and other animals. You should take care to keep them out of streams, lakes and Puget Sound.

Biocontrols are biological agents that control pests. Although it is unlikely they will provide 100% control of a pest, they can help to drop pest numbers below threshold levels.

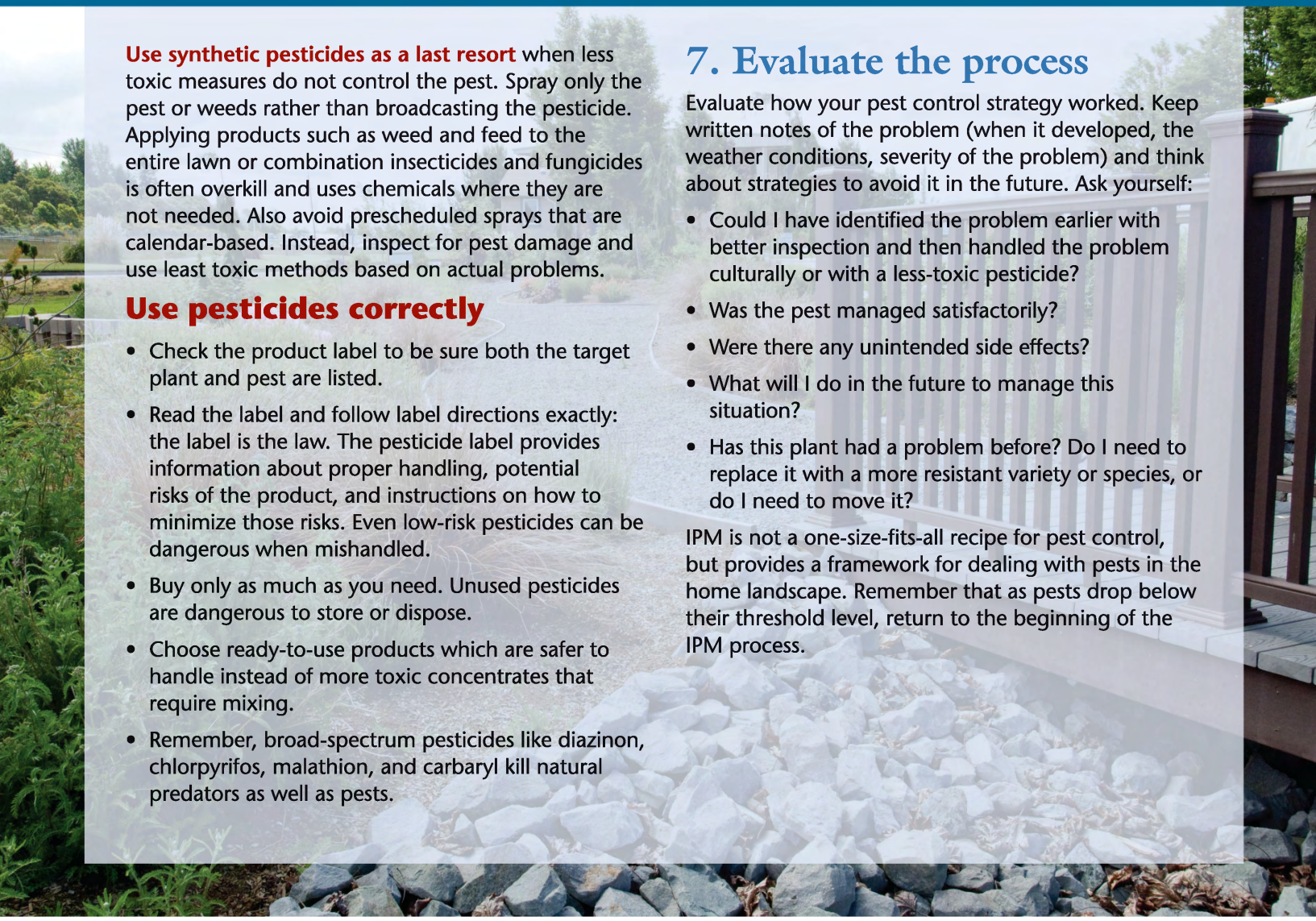
- ***Bacillus thuringiensis*** (Bt) is a commonly available bacteria that poisons caterpillar pests, including cutworms, armyworms, tent caterpillars, cabbage loopers and corn earworms.
- **Predatory nematodes** kill a variety of pests including cutworms, armyworms, root weevil larvae, root maggots, and cranefly larvae. Moisture must be adequate and soil temperatures usually above 55° F for nematodes to be effective.
- **Spinosad** is a microbial insecticide that kills many caterpillar, beetle, and thrips pests, including leaf miners. It is only active if ingested or contacted while in liquid form, so it has little effect on most beneficial species and mammals. It is toxic to shellfish and fish.

Botanicals are plant-derived pesticides that degrade quickly in sunlight or soil.

- **Neem oil** kills and disrupts feeding and mating of many insects, including some beneficials. Neem oil is also used as a fungicide that is less toxic to people, animals, birds and fish.
- **Pyrethrums, ryania, and sabadilla** are plant-derived compounds that kill many pests and degrade quickly in sun and soil. They are toxic to people, fish and other mammals.

Other less toxic products:

- **Horticultural oils** smother mites, aphids, scales, leaf miners and other pests.
- **Horticultural soaps** dry out aphids, white flies, and other soft-bodied insects.
- **Sulfur** controls many fungal diseases such as scab, rust, and powdery mildew. It can be mixed with lime for greater efficacy.
- **Iron phosphate** is a less toxic alternative to metaldehyde and not as hazardous to pets
- **Clove oil and acetic acid** (vinegar and other solutions) burn weed foliage. Repeat applications may be required for effective weed control.



Use synthetic pesticides as a last resort when less toxic measures do not control the pest. Spray only the pest or weeds rather than broadcasting the pesticide. Applying products such as weed and feed to the entire lawn or combination insecticides and fungicides is often overkill and uses chemicals where they are not needed. Also avoid prescheduled sprays that are calendar-based. Instead, inspect for pest damage and use least toxic methods based on actual problems.

Use pesticides correctly

- Check the product label to be sure both the target plant and pest are listed.
- Read the label and follow label directions exactly: the label is the law. The pesticide label provides information about proper handling, potential risks of the product, and instructions on how to minimize those risks. Even low-risk pesticides can be dangerous when mishandled.
- Buy only as much as you need. Unused pesticides are dangerous to store or dispose.
- Choose ready-to-use products which are safer to handle instead of more toxic concentrates that require mixing.
- Remember, broad-spectrum pesticides like diazinon, chlorpyrifos, malathion, and carbaryl kill natural predators as well as pests.

7. Evaluate the process

Evaluate how your pest control strategy worked. Keep written notes of the problem (when it developed, the weather conditions, severity of the problem) and think about strategies to avoid it in the future. Ask yourself:

- Could I have identified the problem earlier with better inspection and then handled the problem culturally or with a less-toxic pesticide?
- Was the pest managed satisfactorily?
- Were there any unintended side effects?
- What will I do in the future to manage this situation?
- Has this plant had a problem before? Do I need to replace it with a more resistant variety or species, or do I need to move it?

IPM is not a one-size-fits-all recipe for pest control, but provides a framework for dealing with pests in the home landscape. Remember that as pests drop below their threshold level, return to the beginning of the IPM process.

Resources

Washington State University: Hortsense **pep.wsu.edu/hortsense/** and Pestsense **pep.wsu.edu/pestsense/**

Washington Toxics Coalition: **watoxics.org/**

National Pesticide Information Center: **npic.orst.edu/**

Skagit County Noxious Weed Control Board: **skagitcounty.net/noxiousweeds**

Pacific Northwest Weed Management Handbook: **pnwhandbooks.org/weed**

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