

Green Gardening Ways That Work !

**Solve Lawn and Garden Problems
in Healthy Ways**

- for Kids,

Pets,

Bees,

Birds,

Salmon,

and all the other

inhabitants of

Puget Sound.

October 19, 2018
Diane Emerson, Michael Laurie
Garden Green – Without Toxic Pesticides
www.gardengreen.org



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Table of Contents Page

Introduction.....3

Animals4



Birds.....4



Deer.....4



Moles.....5



Raccoons.....5



Rodents.....6



Squirrels.....8



Voles.....9



Disease..... 10



Insects..... 12



Moss..... 14



Slugs and Snails..... 15



Weeds..... 16

Introduction

People want to know that the products they use to solve their lawn and garden challenges are not harmful to children, pets, bees, birds, salmon, groundwater, and Puget Sound. But people also want to use safe methods and products that really work, because no one wants to waste their time and money on ways that don't get the job done.

Garden Green is a community initiative led by Michael Laurie and Diane Emerson. We work to reduce the use of toxic pesticides, and to find good, safe alternatives to them. This document is the result of research, our own field testing, and numerous interviews with experienced gardeners and farmers. Our safety reviews are based on research from Grow Smart Grow Safe: www.growsmartgrowsafe.org or The Pharos Project: www.pharosproject.net

Products or methods which are considered especially effective are listed in bold.

To have the best results with these products it is important to take the time to learn how they work, and their limitations. For many of these safe products, they may not kill as completely and quickly as some of the toxic products, but that is the nature of the problem. If a product kills your pest or disease quickly and completely, it may harm other things you **don't** want harmed.

Some of these products need to be used at a particular time. For example, many of the insect sprays work well if applied when you first encounter a few problem insects. If you wait until the insects are overwhelming it may be too late to get the best results with the safe product.

Some of these products are only successful with specific pests, like powdery mildew or aphids, so part of the user's responsibility is to determine exactly what the pest or disease problem is. Thankfully we have Master Gardeners to help accurately identify insect and disease pests: www.mgfkc.org

There are also a number of books and online resources that can help, including:

- Bio-Integral Resource Center, www.birc.org
- The Holistic Orchard book, Michael Phillips, Chelsea Green, 2011
- The Gardener's Guide to Common-Sense Pest Control
- Grow Smart, Grow Safe: www.growsmartgrowsafe.org
- The Pharos Project: www.PharosProject.net
- Great Plant Picks – Plants that are less susceptible to disease and insects in Western Washington: www.GreatPlantPicks.org

Many garden pests have natural predators; such as snakes for slugs and lady beetles for aphids. If a gardener uses too much of a pesticide and kills all of the pests, the predators that do some of the work will have nothing to eat and may leave, or perish. So please minimize your use of even these much safer pesticides, for the good of all the creatures that share your space.

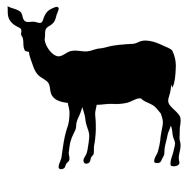
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Animals



Birds

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Bird-X netting	Birds		
Flash Tape	Birds	Bright, reflective tape	Take down after harvest so the birds don't get used to the tape
Floating Row Covers	Birds, deer, insects	Non-woven garden fabric	
Natural Enemy Scarecrow rotating owl head	Birds		
Orbit Yard Enforcer	Birds	Water	
Scare Tape	Birds	Bright, reflective tape	Take down after harvest so the birds don't get used to the tape



Deer

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Deer Scram, Guaranteed	Deer	Dried Blood, Garlic, White Pepper, Cloves, Meat Meal	Sprinkle on both plants and ground around your plants, Activated by water.
Deer-X netting	Deer		
Fencing	Deer		6-8 feet tall if net or wire, 5 ½ feet tall if the deer can't see through the fence
La Torre's Deer out	Deer	Peppermint oil, garlic oil, white pepper, putrescent eggs	



Deer, continued

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Floating Row Covers	Deer, birds, insects	Non-woven garden fabric	Used for row crops
Liquid Fence Deer and Rabbit Repellent	Deer and Rabbits	Putrescent egg solids, garlic, sodium lauryl sulfate, potassium sorbate, thyme oil, water, sodium citrate, sodium benzoate, citric acid, xanthan gum	
Plantskydd Deer Repellent, Guaranteed	Deer	Dried blood of pigs and cows, and vegetable oil	Spray lightly on foliage. Use pre-mixed product within 3 months.
Pro-Tec Deer and Rabbit Repellent	Deer	Garlic oil in plastic clips	Clip onto the stems of roses and other favored plants in the fall, and it will last all winter.



Moles

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Chase Granular Mole and Gopher repellent	Moles and Gophers	Castor oil, sodium lauryl sulfate, and corn cob granules. Not for use where food is grown, but not harmful to birds, pets, or plants.	Be prepared to continue to apply, as moles are notoriously difficult to keep away.



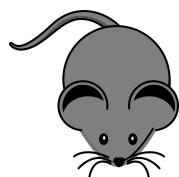
Raccoons

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Havahart Live animal traps and cage traps	The largest size can handle raccoons		Peanut butter bait. FYI: It's legal to trap raccoons on your property, but not to transport them elsewhere.



Raccoons, continued

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Plant cucumbers or squash to protect from raccoons in corn, and at the base of fruit trees.	Raccoons		The cucumbers and squash have prickly leaves that the soft-footed raccoons do not like to step on.
Electric Shock: Electrified wire wrapped around the trunk of a tree will discourage climbing. Or, you can make an ordinary fence raccoon-proof by adding a single electrified strand of wire 8 inches above the ground and 8 inches out from the base of the fence.	Raccoons	For electrifying the wire or fence, a pulsating high-voltage, low-amperage fence charger is used.	Or, a low, two-wire electric fence can be very effective for excluding raccoons from crops. The two wires are fastened on evenly spaced wooden posts; one wire is 6 inches above the ground and the other is 12 inches above the ground.



Rodents

PRODUCT OR METHOD	USED FOR THESE RODENTS	INGREDIENTS	NOTES FOR BEST RESULTS
Automatic Humane Non-Toxic Rat and Mouse Trap Kit with Counter	Rats and ground squirrels. Do not use around our native (and protected) Douglas squirrels. Automatically resets itself. Weather proof.	Kills through a CO2 cartridge when the rat or ground squirrel pokes its head into the trap.	Follow directions carefully, and try different baits if the one which comes with the trap doesn't work for your rodents.
Critter Out	Mice, rats, squirrels	Peppermint oil, lemongrass oil, clove leaf oil, garlic oil, sodium chloride, white pepper, putrescent egg solids	Good to spray under the hood of vehicles where rodents eat wiring
'Great Stuff' Foam Sealant	All rodents in buildings: for sealing openings rodents can enter	Prepolymer of MDI and Polyether polyol	Difficult to re-use a can, so plan to use the whole can once you begin



Rodents, Continued

PRODUCT OR METHOD	USED FOR THESE RODENTS	INGREDIENTS	NOTES FOR BEST RESULTS
Havahart Live animal traps and cage traps	Mice, squirrels, up in size to raccoons		Peanut butter bait. Note: It is legal to trap rodents on your property, but illegal to transport them.
PestZilla Electric Rat Trap	Rats, mice, and squirrels	Kills by electrocution	Should be kept dry. Can short out in rain. For rats, set it out without being turned on for a few nights so they get used to it first.
Rat X	Rats and Mice only	Corn gluten meal, salt	Remove other food sources for best results
'Fresh Cab' Botanical rodent repellent	Rodents	Balsam fir oil	Best for enclosed spaces like storage sheds
Rugged Ranch Ratinator	Rats	Live trap which can trap up to 8 rats at a time	
Pestacator 2000 Plug In Rodent Repeller	Rodents	Plug in unit, uses a pulse technology to send silent pulsing signal through your homes wiring	It will take a week or two to drive them out
T3-R Triple High Impact Rodent Repeller	Mice, rats, squirrels	Repulsive Ultrasonic Sounds (sound above human hearing).	It will take a week or two for the rodents to leave
Victor Electronic mousetrap	Mice only	High voltage shock kills mice in 5 seconds.	
Victor Ultrasonic rodent repellents	Rodents	Emits high frequency sound waves that repel rodents	It will take a week or two for the rodents to leave
Victor Rat and mouse traps	Rodents	Mechanical traps	



Squirrels

PRODUCT OR METHOD	USED FOR THESE ANIMALS	INGREDIENTS	NOTES FOR BEST RESULTS
Deer Out's Critter Out	Squirrels, mice, rats. Vashon Ace Hardware recommends spraying under the hoods of cars to prevent rodents chewing wires.	Peppermint oil, lemongrass oil, clove leaf oil, garlic oil, sodium chloride, white pepper, putrescent egg solids	
Eco-Defense Rodent Gone	Squirrels, mice and rats	peppermint oil, castor oil, cinnamon oil	
Havahart Live animal traps and cage traps	Squirrels, animals in size from mice to raccoons		Peanut butter bait. It's legal to trap on your property, but illegal to transport
PestZilla Electric Rat Trap	Squirrels, mice, rats	Kills by electrocution	Should be kept dry. Can short out in rain.
Raticator S Plus, Version 2.0	Squirrels, mice, rats	Kills by electrocution	This improved version has upgraded electronics and Conformal Coating to help prevent corrosion in humid environments. Still can't be left outside in the rain, though.
Rugged Ranch Squirrelinator Trap	Squirrels – can catch up to 12 gray squirrels at a time	Metal live trap	
Red Pepper Flakes	Repelling squirrels from newly planted bulbs and bird feeders	Red pepper flakes from the grocery store	For bulbs, sprinkle the flakes on the soil over newly planted bulbs. For the bird feeders, mix red pepper flakes in the birdseed. Tested by Cornell University: http://www.walterreeves.com/uploads/pdf/squirrelpepper2.pdf
T3-R Triple High Impact Rodent Repeller	Squirrels, mice, rats	Repulsive Ultrasonic Sounds (sound above human hearing).	It will take a week or two for the rodents to leave.



Voles

PRODUCT OR METHOD	USED FOR THESE ANIMALS	INGREDIENTS	NOTES FOR BEST RESULTS
¼ inch Hardware Cloth or plastic protectors around trees, shrub trunks	Voles, (and damage from string trimmers)	Physical deterrent. No chemicals.	Wrap the trees loosely (to allow for growth) in a collar of 1/4 inch hardware cloth or plastic. Bury it 2 inches deep and it should be 12-18 inches high. Close mowing of the area prevents voles from making their runways and exposes them to predators.
Molemax mole and vole repellent	Voles and moles	Castor oil	



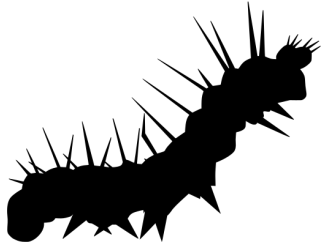
Disease

FOR THESE DISEASES	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
All	Choose native and/or disease resistant plants for our climate, soil, and microclimate		See www.greatplantpicks.org for maritime Pacific Northwest recommendations. Also see the Washington Native Plant Society www.wpns.org/landscaping
All: Build healthy soil so plants can fight off disease on their own	Organic compost and fertilizer		
Black spot, powdery mildew, rust, gray mold, late blight, scab	Serenade Disease Control Concentrate	Bacillus subtilis	
Black spot, powdery mildew, blight and rust	Eco-Smart organic 3 in 1 rose and flower care (disease, insects and mites)	Rosemary oil, thyme oil, sodium lauryl sulfate, peppermint oil	
Black spot, rust, powdery mildew, blight and other common plant diseases.	Eco-Smart Organic Garden Fungicide	Rosemary and rosemary oil, thyme and thyme oil	
Fungal diseases in general	Move sun loving plants to better conditions, as trees and shrubs grow and shade them		
Fungal diseases. Keeps disease spores from splashing up onto leaves, and helps leaves stay dry overnight	Drip irrigation and timer to help avoid overwatering		Set timers to water early in the day, to save water and have dry foliage by night time



Disease, Continued

FOR THESE DISEASES	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
Fungal diseases, including leaf blights, powdery mildew, anthracnose, bacterial canker, apple scab, and more.	Southern Ag Garden Friendly Biological Fungicide	Bacillus amyloliquefaciens strain D747	Best to spray as soon as any fungal disease starts, or even before, as a preventative on susceptible plants.
Powdery mildew, rust, black spot, peach leaf curl, shot hole, leaf blotch, scab, dollar spot, brown rot and other plant diseases	Dr. Earth 8007 Ready to Use Disease Control Fungicide	Rosemary Oil, Cloves & Clove Oil, Peppermint Oil And Malic Acid	
Powdery mildew, other fungal disease	Organocide™ 3-in-1 Garden Spray (fungicide, insecticide, miticide)	Sesame oil, fish oil, lecithin	
Powdery mildew, other fungal disease	Bonide® Sulfur Plant Fungicide RTU	Sulfur. This is pure sulfur. Other products with other ingredients added to the sulfur may not be as safe for the environment	Best to apply before the fungus arrives, or at first signs of a problem.
Powdery mildew, other fungal disease	Safer Brand Garden Fungicide	Sulfur	



Insects

FOR THESE INSECTS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
Ants and roaches	EcoSMART 33103 Organic Ant and Roach Killer	Peppermint oil, rosemary oil	
Aphids, caterpillars, mites	Eco-Smart organic 3 in 1 rose and flower care (disease, insects and mites)	Sesame oil, fish oil, lecithin	
Aphids, caterpillars	Hand removal		Good for early signs of problems
Aphids	Live Ladybugs for aphids by Bug Sales		Better for greenhouses than gardens. Proper timing of releases and the use of lady beetles that have used up their stored fat and are ready to feed are very important
Apple maggot, plum curculio, codling moth, European apple sawfly, oriental fruit moth, tufted apple bud moth, white apple leafhopper, and pear psylla.	Surround WP kaolin clay	A common mineral, when highly refined into powder, it is a patented product called 'Surround'	The tiny clay particles serve to disguise the target fruit and can clog the eyes, ears and reproductive organs of the insects.
Caterpillars, cankerworms, weevils, ants, moths and cutworms	Tree Tanglefoot Insect Barrier	Natural gum resins, castor oil, carnauba wax	Apply it to duct tape, cloth, or directly on the tree
Crawling insects	Eco-Smart organic insect killer, granules version only	2-phenethyl propionate, sodium lauryl sulfate, eugenol, thyme oil, sesame oil	



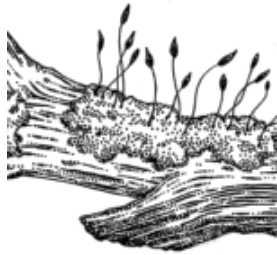
Insects, Continued

USED FOR THESE INSECTS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
Flea beetles, cabbage moths, and other insects, as well as deer and birds	Floating Row Covers	Non-woven garden fabric	
Fruit flies	Terro Fruit fly trap	Sodium lauryl sulfate, acetic acid	
Ground bees	Tarps placed over ground nesting bee holes		Place at night. Make sure the tarp extends several feet beyond the holes, and weight them down. Leave in place for a week.
Many insects	Plants to attract beneficial insects		Sweet alyssum, dill, yarrow, angelica, dandelion, lemon balm, parsley, tansy, spearmint, and others
Mosquitoes and other flying insects	Citronella incense sticks	Brazilian Andiroba oil blended with citronella, rosemary & thyme	
Mosquitoes, flies, any flying insect you can touch with the racket.	Zap-It! Bug Zapper Racket	No chemicals. Zaps them with electricity, but safe for humans to touch. Has rechargeable battery.	Similar to a fly swatter, but you can kill them on the wing with this.
Wasps and hornets	EcoSMART 33105 Organic Wasp and Hornet Killer	Peppermint oil, phenethyl propionate	
Wasps, yellow jackets, and hornets.	Waspinator Fake Wasp Nests	No chemicals. Cloth or nonwoven. Repels based on visual clues only, because wasps are territorial.	Works best if wasp nests are not well established. Store the fake nest inside during winter. You may want to stuff plastic bags inside it to help it keep its shape over time.



Insects, Continued

USED FOR THESE INSECTS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
Whiteflies, aphids, mealy bugs, mites	Bug Blaster Bbn Conversion Nozzle	Water, sprayed in such a way that it gets the undersides of leaves and crevices	Be sure to buy the extension too, or you will get wet!
Whiteflies	Safer Sticky Trap for whiteflies	Attracted to yellow color, trapped on sticky paper	
Yellow jackets (wasps)	Rescue YJTR-DT12 Reusable Yellow Jacket Trap	Food product attractant	



Moss

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Agricultural Lime	Moss in the lawn: This adjusts soil pH so grass can better compete with acid-loving moss	Ground limestone	Apply spring and fall
Baking Soda	Moss	Bicarbonate of soda	
Pruners to cut overhanging limbs	Moss		To increase light and air circulation
Scraping tool for roof	Moss		Be careful not to damage shingles



Slugs and Snails

PRODUCT OR METHOD	USED FOR	INGREDIENTS	NOTES FOR BEST RESULTS
Beer Traps	Slugs and snails	Beer, to drown them	Find a gallon plastic jug. Cut a 1" by 1" opening about 3-4" above the bottom. Add one can of beer. Our big slugs need a couple inches of depth to drown in. No need to remove dead slugs.
Corry's Slug & Snail Copper Tape Barrier	Slug and snail repellent	Adhesive Copper tape	Apply to pots, raised beds, ends of mushroom logs, and more.
Encourage predators: Ground beetles, snakes, voles, ducks, other birds, and toads	Slugs and snails		Provide cover and water
Hand Pick slugs and kill or relocate.	Slugs and snails		Go out at night or early morning, and on cloudy, wet days. Consider relocating the native banana slugs to the forest.
Other traps	Slugs and snails	Boards, upside down pots, cardboard	Create a nice daytime hiding place for the slugs and snails, and go out on a sunny day and collect them from their cool, shady spot.
Safer® Slug & Snail Copper Tape Barrier	Slug and snail repellent	Adhesive Copper tape	Can make protective collars by cutting up plastic containers and putting copper tape around a 4-6 inch tall 'collar'. Be sure collar is tight to the ground, protecting the individual plant, so slugs don't go underneath it. Best for tender new lettuce, pea, and cilantro seedlings.



Weeds

USE FOR THESE WEEDS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
All except noxious weeds required by law to be controlled.	Allow a few weeds to live in the lawn or garden		Relax. Weeds are good for pollinators, birds, beneficial predator insects, and butterflies.
All weeds	Hire teenagers to weed		Need good supervision. Suggest \$15/hr.
All weed seeds: Mulch bare soil to help keep weeds from sprouting. Mulch several inches thick, unless it is fresh grass clippings. Fresh grass clippings should be spread no deeper than 2 inches so they dry out instead of turn slimy.	Mulch, including Sheet Mulching, where you place cardboard under the mulch to kill grass and weeds underneath the mulch.	Mulch with wood chips, compost, straw, cardboard, 100% cotton or wool rugs, sheets, clothing, thick cardboard, burlap bags, etc.	Vary the mulch to define where your paths are. Cardboard from recycling can be used under mulch for longer lasting protection, and to kill the weeds below the mulch.
All types of actively growing weeds and grasses	Bonide Burn Out	citric acid and clove oil	
All weeds. Weeds come in when you leave bare soil.	Plant temporary cover crops in bare soil: annual clovers, peas, oats and buckwheat, others		
All weeds. Can also be used to kill temporary cover crops prior to planting vegetables or other desirable plants.	Occultation tarps (silage tarps) Heavy duty tarps that can be re-used.	Light-proof materials: black re-usable silage tarps.	Water well before laying down the tarp. Avoid single use black plastic.
All weeds	Drip irrigation and timer provides Accurate watering so weeds are not watered		Have replacement parts on hand. Check emitters regularly during the season.



Weeds, Continued

USE FOR THESE WEEDS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
All actively growing weeds and grasses	Vinegar, 20 per cent pure vinegar, acetic acid	Acetic acid	Wear protective eyewear and rubber gloves. Most effective if plants are stressed from lack of water, and sprayed on a hot sunny day.
All weeds in gravel paths and driveways, stone walls, paving cracks	Flame weeder	Propane flame	Best used on small plants, when they have been watered well.
All small weeds in sidewalks, patio cracks, other paved areas	Boiling water		Do it when the plants are already stressed by heat and drought. Make sure the water is at full boil.
All weeds	Weeding Tools		A saw tooth shovel, for example, is great for digging out blackberry roots.
All weeds	Worldwide Workers On Organic Farms (WWOOFers) or HelpX workers: 4 hours of work a day in exchange for room and board		Need a place for them to sleep, need to feed them, and often transport them. https://woofusa.org/ and https://www.helpx.net/
All weeds	Water with drip irrigation on a timer	Discourages annual weeds from sprouting, and slows down perennial weeds	Helpful to have timers and filters on the water lines.
Annual weeds, seedlings of perennial weeds	Down to Earth Corn Weed Blocker. It is a pre-emergent & keeps many plant seeds from sprouting	Corn gluten meal	Best used in dry conditions. No effect on established plants.
Annual weeds plus seeds of perennial weeds. It is a pre-emergent, preventing many plant seeds from sprouting.	Preen® Organic Vegetable Garden Weed Preventer	Corn gluten meal	Best used in dry conditions. No effect on established plants



Weeds, Continued

USE FOR THESE WEEDS	PRODUCT OR METHOD	INGREDIENTS	NOTES FOR BEST RESULTS
Annual weeds	Water deeply but infrequently	Discourages annual weeds from sprouting	Best if your soil is at least 4 inches deep
Blackberries, ivy, even holly, but not the berries of ivy or holly	Goats and Sheep		Need good temporary fencing or supervision, and knowledge of toxic plants they can't eat.
Blackberries	Sawtooth Shovel		Great for digging out blackberry roots. A regular shovel slides off the root, but this shovel grabs the root so you can easily pry out the root.
Blackberries, stinging nettle	Thorn proof elbow-length gloves	Synthetic suede or other thorn proof material	Much easier to pull out young blackberries when soil is moist.
Grass and broadleaf weeds. Do not use where it can get into streams, lakes, or Puget Sound, as it is toxic for crustaceans and fish.	BioSafe Weed Control . OMRI rated	Ammonium Nonanoate, aka Ammonium salt of fatty acid	Grass and broadleaf weeds.