

Grow

It!

The Less-Toxic
Garden.

Control Pests and Plant Disease
Using Less-Toxic Methods.



Thanks

The San Francisco Water Pollution Prevention Program would like to thank the following who provided assistance with this original guide book: Tanya Drlik, Pam Pierce, Jane Lavelle, San Francisco League of Urban Gardeners and Illustrator, Jenny Speckles. Thanks also to those who helped with the April 2007 edition of the Grow It! guide, including Christine Finch.

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The City and County of San Francisco Public Utilities Commission, Bureau of Environmental Regulation and Management, Water Pollution Prevention Program has developed this guide to provide information on chemical-free and less-toxic alternatives for the home and garden to reduce the amount of toxic pollutants discharged to the City's combined sewerage system. Any mention of products, vendors, or technologies does not constitute an endorsement by the City and County of San Francisco.

Printed on recycled paper.



**Santa Clara Valley
Urban Runoff
Pollution Prevention Program**



**Santa Clara Valley
Urban Runoff
Pollution Prevention Program**

Call 1-800-794-2482

Congratulations! You have taken the first step to create a safer place for yourself, your family and our watershed. Our watershed is more than just a drainage area. It is the place we live, work, play, and find inspiration. Our everyday activities impact our watershed and the quality of our lives now and in the future. This guide will help you create a vibrant garden and do the earth a good turn by showing you how to:

- Control pests naturally
- Plant the right plants
- Create healthy soil
- Reduce toxic chemical use

A word about garden chemicals:

Fish and wildlife are harmed through overuse and improper disposal of chemicals. These include:

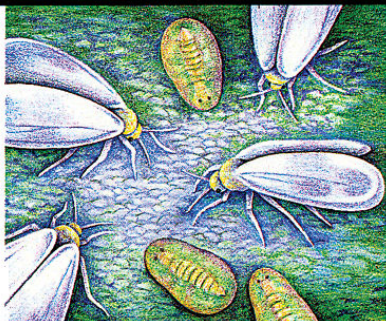
- Chemicals that are over-applied or not used according to label directions
- Chemicals poured down household drains
- Chemicals washed into storm drains by rain or overwatering

Chemicals thrown away in the garbage can cause problems for landfills. Local resources for proper disposal of chemicals exist to help you.

Keep reading for less-toxic alternatives to chemical pest control. For more information to help protect our Bay Area waters call:
1-800-794-2482

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) is a group of local agencies focused on challenges and opportunities to improve the quality of storm water runoff to local creeks and the South San Francisco Bay.

W H I T E F L I E S



DETECTION

Beans, poinsettias, and tomatoes are susceptible to whiteflies. Look at leaf underside for small, light-colored speckled larvae, or tap the plant to see if small white insects flutter about (during warmer months).

LESS TOXIC CONTROLS

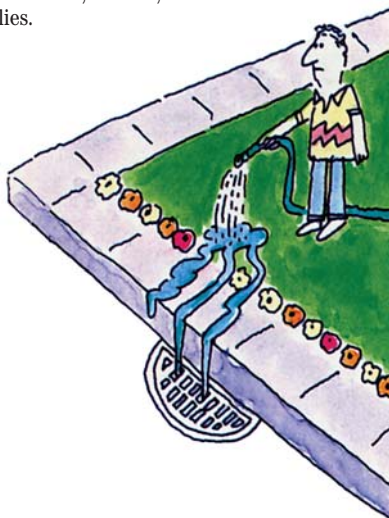
- Avoid the use of broad-spectrum pesticides; they can cause a whitefly outbreak.
- Spray bad infestations with insecticidal soap or horticultural oil (see Aphids).
- Vacuum the plants when the air is cool.
- Install yellow sticky traps (yellow attracts these insects).

PREVENTION

- Do not over-fertilize with nitrogen.
- Prune and remove badly infested leaves and plants.

Your Garden and The Bay

Garden and yard chemicals can pollute our creeks, the Bay and Delta. Rain and over-watering wash chemicals off lawns and gardens into storm drains. Chemicals entering storm drains flow directly to our waterways. Even chemicals poured down household drains cannot be removed at the sewage treatment plant and enter waterways **untreated**. Either practice harms our fish, wildlife, and clean water supplies.





DETECTION

Yellowjackets- found around picnics and garbage in late summer and early fall- look for sweet and protein-rich foods. Yellowjackets are aggressive and can inflict multiple stings. Their papery nests are completely enclosed and mostly located in the ground.

Paper Wasps- not aggressive and usually need no control- resemble yellowjackets but have long, dangling legs. Their papery nests are open and look like small umbrellas hanging from caves.

LESS TOXIC CONTROLS

(for yellowjackets and wasps)

- Trap yellowjackets using commercial traps baited with liverwurst. Cone-type traps can be baited with sweet liquids. Freeze trap overnight or seal in a plastic bag and set in the sun for several hours before emptying.
- Have a professional kill only nests that directly threaten humans. Only extremely small amounts of pyrethrin insecticide need to be used. Never use gasoline.

PREVENTION

(for yellowjackets and wasps)

- Bring traps along on picnics in late summer and early fall.
- Keep garbage cans sealed. Keep pet food indoors and in a screened area. Pick up fallen fruit from trees.
- Never swat at a wasp. Move slowly and brush it away gently, without sharp motions.

Free Pesticide and Fertilizer Disposal

Always follow label directions when mixing, cleaning up, and disposing of garden chemicals:

- Never pour garden chemicals down household drains
- Never clean up and hose garden chemicals into streets, gutters, or storm drains
- Never dispose of leftover garden chemicals in the trash

The following garden products can be disposed of FREE at mobile collection events and permanent collections sites for household hazardous waste (HHW) in the Bay Area:

- Fungicides
- Herbicides
- Insecticides
- Rat, mouse, and gopher poison
- Soil fumigants
- Snail and slug poison
- Vegetation killer
- Weed killer

For more information see [Resources](#) in this guide.

Transporting Household Hazardous Wastes: Follow these important guidelines when transporting HHW to mobile or permanent collection sites:

- Do not transport more than five gallons or fifty pounds of hazardous waste in your vehicle.
- Do not mix materials together.
- Keep pesticides and other chemicals in their original container
- Make sure lids and bags are sealed tightly.
- Pack waste carefully in the trunk of your vehicle in leak-proof containers or boxes that you plan to leave at the collection site.



DETECTION

Spiders are beneficial creatures that feed on insects. Habitat varies widely. Many spiders make webs. The vast majority of spiders are not dangerous and cannot pierce human skin with their mouthparts.

LESSTOXIC CONTROLS

- Vacuum up spider and web.
- To avoid killing a spider, cover it with a glass and slide an index card under the glass. Release spider outside.
- If possible, eliminate spider's food supply.

PREVENTION

- Vacuum regularly.

Household Hazardous Waste Facility

It is best to use up pesticides and fertilizers or give them to a friend or community group that will use them. Do not use pesticides that have been banned or restricted, such as dursban (chlorpyrifos), and diazinon, two commonly used insecticides. Unusable pesticides, fertilizers, and other household hazardous waste can be taken to a household hazardous waste drop-off site free of charge.

Santa Clara County Household Hazardous Waste Program

(408) 299-7300 or visit www.hhw.org

Drop-off sites are open to all County residents (except Palo Alto residents). Call for nearest location and to make an appointment. Residents can bring unwanted pesticides, fertilizers, motor oil, oil filters, antifreeze, other auto fluids and cleaners, latex and oil based paints or stains, batteries, adhesive, flammable or combustible liquids, household cleaners, pool chemicals, aerosol cans, and mercury. Residents can also pick-up leftover pesticides, fertilizers, paint and cleaning products at Reuse Centers.

City of Palo Alto (650) 496-6980

Monthly drop-off open to residents of Palo Alto. Call for more information or visit www.cleanbay.org

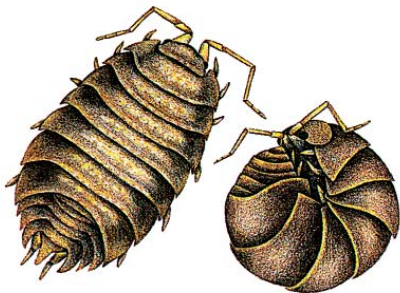
City of Sunnyvale (408) 730-7262

Monthly drop-off open to residents of Sunnyvale. Call for more information or visit www.sunnyvalerecycles.org

Other County residents can use the HHW facility in Sunnyvale by making an appointment at (408) 299-7300

For 24-hour information: 1-800-C-L-E-A-N-U-P or visit www.1800cleanup.org

SOW AND PILLBUGS



DETECTION

Sow and pillbugs live in a moist environment, such as plants on the verge of decay (e.g. ripe strawberries, ripening tomatoes that are touching the ground, etc.). Year-round, look in debris and on the soil surface for grey, segmented bugs that curl up into a ball when disturbed.


LESS TOXIC CONTROLS

- Hand pick and crush.
- Make baits with cubes of raw potato (Check daily and trowel the bugs into a plastic bag or a pail of soapy water).

PREVENTION

- Spread mulch on soil (see Earwigs).
- Grow plants up trellises or at least keep ripening fruit off the ground.
- Remove dying lower leaves to improve air circulation.

Creating Healthy Soil



By adding compost, you can create soil with enough organic matter and the right nutrients to grow strong healthy plants that can resist disease and insect attacks without pesticides. They also require less care. For more information, contact your local gardening program (see Resource page).

USE OF COMPOST:

Soil Amending:

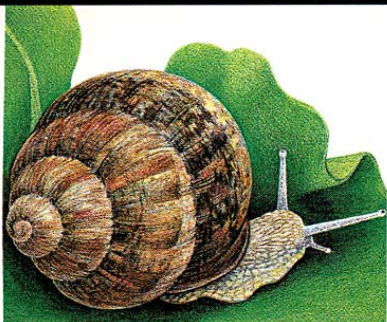
Mix a 4"– 6" layer of compost deep into newly reclaimed or poor soils. Dig 1"– 3" of compost into annual garden beds at least once a year.

Mulching:

Spread compost 3"– 5" thick over soil around plants during the growing season. Do not pile mulch against plant stems.

Potting Mix:

Mix equal parts of compost and sand or soil, depending upon your soil needs. Be sure compost is fully decomposed and sifted before mixing.



DETECTION

Snails and slugs will eat almost any kind of plant. Look for them at the bases of leaves, in moist cool areas, or under debris, boards, and flowerpots. Snails and slugs leave a shiny slime trail on leaves or soil.


LESSTOXIC CONTROLS

- Hand-pick and crush or drop into soapy water. Hunt at night between 10 pm and 11 pm with a flashlight or, in daylight, look in smooth, dry, dark hiding places.
- Remove pearl-like egg clusters to reduce populations.
- If you use commercial baits, place them in a covered container such as a plastic margarine tub, and cut a hole for the snail/slug's entrance.
- Set out traps such as overturned flower pots or plastic garbage bags laid on the soil or on groundcovers. Check in morning.

PREVENTION

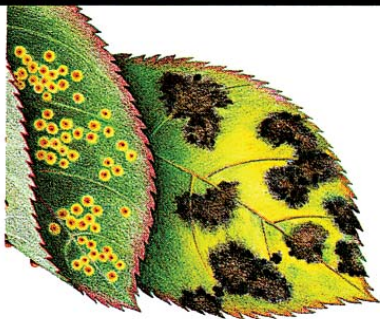
- Ground beetles, found in compost, will eat slugs and snails.
- Remove garden debris (loose boards, old pots, etc.) unless you're using them as traps.
- Remove or reduce the area of favored breeding sites such as ivy, nasturtiums, and clumps of iris.
- Install a band of copper sheeting (available at nurseries) around tree trunks, flower pots, or planters.
- Dry sawdust paths will deter snails and slugs.

Beneficial Creatures



The naturally occurring beneficial creatures that already frequent your garden feed on a wide variety of pest insects, such as aphids and mites, and can help reduce the need for broad-spectrum chemical pesticides. These beneficials include lacewings, ladybugs, ground beetles, syrphid (hover) flies, tiny parasitic wasps, and spiders. Because of their habits and other factors, beneficials are particularly susceptible to pesticides. By significantly reducing your use of pesticides, you'll find that the numbers of these naturally occurring "toxic-free pest controls" will increase in your garden.

You can also purchase certain beneficial organisms from nurseries and gardening catalogs; however, purchasing ladybugs or praying mantises is a poor choice. Purchased ladybugs fly away from your garden without feeding, and praying mantises feed indiscriminately (they eat your beneficials, too), and aren't adapted to the local climate.



DETECTION

Many garden roses, especially hybrid tea, floribunda, and grandiflora, are susceptible to diseases, such as black spot and rust. Symptoms of black spot are circular black spots with fringed edges on canes and on both leaf surfaces. Symptoms of rust are small orange or yellow pustules on any green portion of the plant.

LESS TOXIC CONTROLS

- In mid-January, remove all leaves from the plant and destroy them, prune and destroy any infected canes, and then apply a layer of mulch around the plant (the mulch acts as a barrier between the plant and the overwintering disease spores on the debris beneath the plants).
- In fall, rake up all leaves and petals and apply a layer of mulch.
- Spray with fungicidal soap (available in nurseries).
- Spray with a baking soda mixture (see Powdery Mildew).
- Spray with a sulfur-based fungicide. Be sure to cover the tops and undersides of the leaves paying special attention to the growing tips. Begin application early in the season. Do not apply sulfur when temperatures exceed 85 degrees Fahrenheit.

Plants That Attract Beneficials

You can also attract beneficial creatures to your garden by growing certain plants whose pollen and nectar provide them with food. Try planting:

- Parsley family (parsley, fennel, coriander, dill and chervil)
- Sunflower family (sunflowers, daisies, asters, and cosmos)
- Sweet alyssum
- Native buckwheat
- Baby blue eyes
- Tidy tips

These plants must be allowed to bloom in order to attract beneficial insects, which feed on their nectar and pollen.



PREVENTION

- Plant disease-resistant varieties, such as Rose banksiae or polyantha and rugosa roses.
- Plant roses where they will get six or more hours of sun and good circulation.
- Keep plants well watered.
- Prune roses so they have open centers.
- Keep foliage dry by avoiding overhead sprinkling, or sprinkle at time when foliage will have time to dry before nightfall.
- Avoid over-fertilization and use slow release fertilizers (see Aphids).

Native Plants

VS.

Exotics

When planting in your yard, consider using native species in your landscaping.

It is important for gardeners to be aware of the problems and opportunities associated with native and exotic plants. The landscape industry traditionally provides cultivars (i.e., plants that are bred and cloned for specific attributes, such as color of leaves or flowers.) and exotic plants, which are attractive to the eye. However, exotic plants may become another kind of garden pest – an “invasive species.” When these plants invade, they can destroy other species and habitat in your neighboring creek, wetland, or oak woodland. Native plants are less common in landscape nurseries, but many are available if you take time to look for them.

In general, plants that have evolved in a given geographic area are best adapted to that area and require less maintenance in the long run than some of the traditional exotics. These native plants need less water, fertilizers, and pesticides to do well – saving you money. Another benefit is that native birds, insects, and other wildlife have evolved with the native plant species and are able to use the nectars, fruits, and habitat these plants provide. Exotic plants, on the other hand, usually require more maintenance; or they may simply get out of control and smother other plants, creating seemingly sterile monocultures. Periwinkle, for example, can be seen along stream banks; however, it is very invasive and can quickly block out the growth of other plants, including natives.

POWDERY MILDEW



DETECTION

Powdery mildew attacks many plants. Early symptoms are raised, blister-like areas that cause leaves to curl. Later, leaves are covered by a greyish-white, powdery fungal growth. Unopened flower buds can become white and fail to open. This fungus prefers young succulent growth.

LESS TOXIC CONTROLS

- Prune out damaged foliage or flowers.
- Wash new growth with a spray of ordinary water. Powdery Mildew thrives in cool, dry conditions.
- Spray new growth with antitranspirants (available in nurseries). These are waxes, silicones, or other compounds that make an invisible barrier to prevent powdery mildew spores from penetrating plant tissue.
- Spray with a baking soda mixture: 1 tablespoon baking soda plus 2 ½ tablespoons of horticultural oil (see Aphids) in one gallon of water. Spray at the first sign of the disease and repeat whenever new symptoms appear.

PREVENTION

- Plant disease-resistant varieties (this applies to many roses).
- Avoid over-fertilization and use slow-release fertilizers (see Aphids).

Santa Clara County Climate Zones

Santa Clara County has four major climate zones with varying amounts of sun, rain and fog. Using plants that are right for your zone will reduce the need for pest control in your garden. The plants listed in this guide are appropriate for any of the climate zones below. Local nurseries and the Sunset Western Garden Book can provide additional guidance on selecting appropriate plants for each climate zone.

Zone 14

(Inland area with ocean/Bay influence)
Gilroy, Morgan Hill

Zone 15

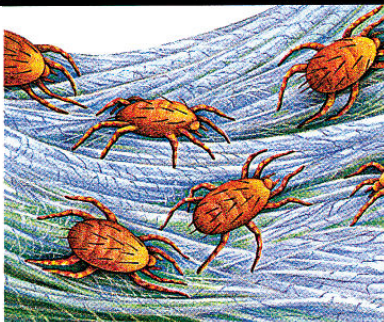
(Coastal climate with chilly winters)
Campbell, Los Altos, Mountain View, Palo Alto, South San Jose, Sunnyvale

Zone 16

(Coastal climate with milder winters)
Cupertino, Los Altos Hills, Los Gatos, Monte Sereno, Saratoga

Zone 17

(Climate dominated by the ocean/Bay)
Milpitas, eastern Palo Alto and Mountain View, Santa Clara, San Jose, northern Sunnyvale



DETECTION

Mites are tiny, 8-legged creatures that feed on vegetables, and ornamental and indoor plants. Inspect the undersides of leaves with a magnifying glass of 15x or greater. Look for stippling, silvering, or yellowing of upper surface of leaves and fine webbing under and between leaves.

LESS TOXIC CONTROLS

- Avoid using broad-spectrum pesticides because they will kill more of the beneficials than the pest mites.
- Isolate infested indoor plants so they will not affect others.
- Spray with insecticidal soap or horticultural oil (see Aphids).
- Dust with sulfur, but do not use horticultural oils for a month after sulfur application because sulfur residues can cause oil sprays to burn plant leaves.

PREVENTION

- Keep plants well watered because water stressed plants are more susceptible to mites.

The Right Vegetables

All Zones

Arugula	Lettuce
Asparagus	New Zealand Spinach
Beans – Scarlet Runner* (Snap)	Onions
Beets	Parsnips
Broccoli	Peppers
Cabbage	Potatoes
Carrot	Peas - Snap and Snow Peas
Cauliflower	Pumpkins*
Celery	Radishes
Corn (short season varieties in zone 17)	Shallots
Cucumber (short season varieties in zone 17)	Spinach
Fava Beans	Summer Squash*
Garlic	Sunflowers*
Globe Artichoke	Tomatoes (short season varieties in zone 17)
Greens - Mustard	Turnips
Leeks	Winter Squash*

**Grows well in warm season only (April to October)*



DETECTION

Seedlings can sometimes be severely damaged by leafminers, but in general they are a cosmetic problem and in many cases will not cause significant damage to the plant. Leafminers like spinach, beets, chard, and sometimes ornamentals. Look for grey, light green, or brown trails (or blotches) in leaves. Leafminers feed between the upper and lower surfaces of the leaf.

LESS TOXIC CONTROLS

- Hand-pick and destroy affected leaves.
- If problems are severe, try spraying young plants with horticultural oil (see Aphids). Cover the soil around the affected plants with plastic mulch (available at nurseries) to prevent the larvae that fall off the plant from getting into the soil to pupate (spin the cocoons).
- Pesticides will not work.

PREVENTION

- Plant seeds or seedlings under floating row covers (see Cabbage Loopers).
- With some plants, especially columbine, adequate watering can reduce infestations.

The Right Herbs for the San Francisco Bay Area

Annual

Basil - Sweet and Holy (only in warmer parts of the area)

Borage

Chervil

Coriander

Dill

Mustard Seed (Black Mustard)

Biennials

Anise Hyssop

Chinese Celery

Fennel (Sweet, Bronze, and Florence Fennel)*

Trees

Bay Laurel and California Bay

Perennials

Chamomile*

Catnip

Catmint

Cat Thyme

Chives*

Epazote (Mexican Tea)

Garlic Chives

Lavender (English, French, and Spanish)

Lemon Balm*

Lemongrass

Marjoram

Mint (Apple Mint, Corsican Mint, Orange Mint, Peppermint, and Spearmint)

Oregano, Greek*

Rosemary*

Sage, Garden*

Tarragon, French

Thyme (English, Lemon, and Caraway)*

Yerba Buena

**Drought tolerant once established*



DETECTION

Lawn weeds are easily detectable. Most people can tolerate a few weeds, so make it your goal to keep weed numbers low enough to prevent significant visual damage. The number you can tolerate is a personal decision.

LESS TOXIC CONTROLS

- Dig out small patches of weeds with a sharp weed-knife or v-shaped dandelion knife. Immediately loosen the soil and sow grass in the bare spot.
- Spray weeds with herbicidal soap (available in nurseries). This soap will also damage grass, so cover surrounding grass with cardboard or plastic.
- Do not use lawn fertilizer containing herbicides.

PREVENTION

- Plant appropriate grass species for your area.
- Fertilize your lawn in spring and fall with a slow-release fertilizer (see Aphids).
- Lawns mown too close to the ground are very susceptible to weed invasions. Set the mowing height at 2 – ½” to 3” so the grass can shade out the weeds.
- Aim for slow, deep irrigation. Over–or under–watered lawns are also susceptible to weed invasions.
- Aerate your lawn regularly.
- Consider planting drought-tolerant ground covers instead of grass.

The Right Cut Flowers for the San Francisco Bay Area

Perennials

Calla Lily
Chrysanthemum
Clarkia
Columbine
Coreopsis
Crocasmia
Daffodil
Dahlia
Day Lily
Feverfew
Foxglove
Freesia
Gaillardia

Annuals

Calendula (Pot
Marigold)
Cornflower
(Bachelor's Button)
Cosmos
Flowering Tobacco
Forget-me-not
Godetia
Johnnie-jump up
Larkspur
Love in a mist
Marigold
Nasturtium
Pansy
Pincushion Flower
Shirley Poppy
Snapdragon
Statice
Stock
Strawflower
Sweet Alyssum
Sweet Pea
Sweet William
Viola
Zinnia



DETECTION

Adult fleas are most often found on pets. Flea eggs, larvae, and pupae are found in cracks and crevices, in rugs, and anywhere animals rest or sleep.

LESS TOXIC CONTROLS

- Comb pets with a flea comb.
- Outside, use flea-attacking nematodes on areas with high flea populations.
- Spot-treat areas with an insect growth regulator, such as methoprene, to arrest flea development.
- Use borate carpet treatments or sprinkle and brush in diatomaceous earth.
- Use commercial flea traps made of a light bulb and sticky paper. The best traps have a green light that can flicker on and off.
- Vacuum carpets, furniture and floors weekly; daily in flea season. Carpets can be steam cleaned.
- Wash or vacuum pet bedding frequently.

PREVENTION

- Comb pets during pet season.
- Restrict pets to specified areas and vacuum those areas frequently.

Native Drought Tolerant Plants

Botanical Name

Common Name

Perennials

<i>Achillea millefolium</i>	Yarrow
<i>Agastache rupestris</i>	Licorice Mint
<i>Asclepias speciosa</i>	Showy Milkweed
<i>Aquilegia Formosa</i>	Western Columbine
<i>Camissonia cheiranthifolia</i>	Beach Evening Primrose
<i>Delphinium cardinale</i>	Scarlet Larkspur
<i>Eschscholzia californica</i>	California Poppy
<i>Epilobium canum</i>	California Fuschia
<i>Eriogonum crocatum</i>	Saffron Buckwheat
<i>Heuchera species</i>	Coral Bells
<i>Iris</i>	Pacific Coast Iris
<i>Mimulus cardinalis</i>	Scarlet Monkeyflower
<i>Penstemon heterophyllus</i>	Foothill Penstemon
<i>Salvia spathacea</i>	Hummingbird Sage
<i>Saxifraga californica</i>	California Saxifrage
<i>Scrophularia californica</i>	California Figwort
<i>Sidalcea malviflora</i>	Checkerbloom
<i>Sisyrinchium bellum</i>	Blue-Eyed Grass

Annuals

<i>Clarkia amoena</i>	Farewell to Spring
<i>Collinsia heterophylla</i>	Chinese Houses
<i>Gilia capitata</i>	Globe Gilia
<i>Layia platyglossa</i>	Tidy Tips
<i>Limnanthes douglasii</i>	Meadowfoam
<i>Lupinus microcarpus</i>	Whorled Lupine
<i>Madia elegans</i>	Tarweed
<i>Nemophila menziesii</i>	Baby Blue Eyes
<i>Phacelias tanacetifolia</i>	Tansy Leafed Phacelia
<i>Platystemon californicus</i>	Cream Cups
<i>Stylomencon heterophylla</i>	Wind Poppy



DETECTION

Earwigs attack leaves of seedlings or older plants. Look for shiny brown insects, with pincers on the rear ends, in plant crevices, near the soil surface, under flower pots, or boards. Earwigs are often blamed for damage done by other insects or snails and slugs because they like to curl up in plant crevices and holes in fruit during the day. To be sure which pest is causing the damage, check with a flashlight over several consecutive nights.

LESSTOXIC CONTROLS

- Hand-pick earwigs and crush on a hard surface.
- Set out short lengths of bamboo or rolled up newspaper to trap earwigs. Check in the morning and shake earwigs into a bucket of soapy water.
- Set out traps made from tuna fish cans containing ½" inch of vegetable oil.
- Set out traps made from plastic cottage cheese containers filled with ½" of soy sauce covered with a thin film of vegetable oil. Punch several holes in the side of the container near the top through which the earwigs can enter. Replace the lid to reduce evaporation.

PREVENTION

- Spread thick organic mulch on the soil (Earwigs will eat the mulch). Add another layer of mulch when the original layer decomposes.
- Start seedlings indoors and plant out when large enough to withstand damage.

Native Drought Tolerant Plants

... continuation

Botanical Name

Common Name

Shrubs

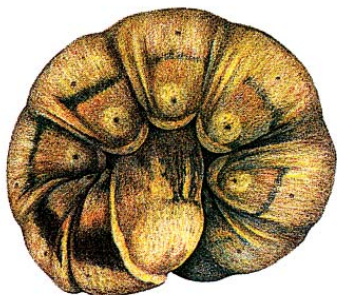
<i>Baccharis pilularis</i>	Coyote Brush
<i>Carpenteria californica</i>	Bush Anemone
<i>Ceanothus species</i>	California Lilac
<i>Dendromecon harfordii</i>	Island Bush Poppy
<i>Eriogonum giganteum</i>	St. Catherines Lace
<i>Galvezia speciosa</i>	Island Snapdragon
<i>Garrya elliptica</i>	Silk Tassel Tree
<i>Holodiscus discolor</i>	Cream Bush
<i>Philadelphus lewisii</i>	Mock Orange

Trees

<i>Aesculus californica</i>	California Buckeye
<i>Cercis occidentalis</i>	Western Redbud
<i>Sambucus mexicana</i>	Elderberry

Vines

<i>Clematis lasiantha</i>	Chaparral Clematis
<i>Lathyrus laetiflorus</i>	Wild Sweet Pea
<i>Lonicera hispidula</i>	California Honeysuckle



DETECTION

Cutworms can attack many tender, young plants. Cutworms are flat brown worms found in burrows in the top few inches of soil or under the litter on the top of the soil. Suspect cutworms if you find seedlings chewed off at or just above the soil line. They feed at night and will also feed on leaves and buds.

LESS TOXIC CONTROLS

- Hand pick during the day searching in widening rings around the stems of seedlings.

PREVENTION

- Start vegetable and flower seedlings indoors and plant outside when they are large enough to withstand some damage.
- Surround seedlings with 4-inch high collars of cardboard (juice can or toilet paper tubes) pushed into the soil about an inch.
- Cover individual seedlings with cones made of window screen. Push cones down into the soil and inch or two.
- You may be able to reduce cutworm damage by clearing weeds (especially grass and grass-like weeds) in the garden before planting. Eliminating all weed food for cutworms for at least 10 days before seedlings come up will starve the cutworm.

Resources

For More Information About...

**Gardening Techniques, Composting,
and Organic Pest Control:**

**U.C. Cooperative Extension
Master Gardener Program**

(408) 282-3105

www.mastergardeners.org/scc.html

**Less-Toxic Control Techniques, Sources of
Beneficial Insects and Pest Control Products:**

Bio-Integral Resource Center (BIRC)

(510) 524-2567

BIRC publishes a variety of booklets on specific pest problems and their Product and Services Catalog lists sources and least-toxic pest control products and beneficial organisms.

ARGENTINE ANTS



Controlling Pests The Less Toxic Way

DETECTION

Look for single scouts or long lines of ants in or around the house, near food or water. Distinguish from carpenter ants by size. Argentine Ants are small (1/8"), their queen slightly larger; carpenter ants are much larger (1/4" or more).

LESS TOXIC CONTROLS

- Use soapy water in a spray bottle to kill ants. Wipe up with a sponge.
- Follow trails to find entry points. Temporarily close with petroleum jelly or duct tape. Use silicone caulk for a permanent seal.
- Use slow-acting baits containing boric acid or hydramethylnon. Do not leave baits out after ant trails have disappeared.

PREVENTION

- Store food in containers that seal tightly. Wash dishes frequently; wipe up spills.
- During ant invasions, empty garbage often and keep sweet, protein-rich, or greasy items in the refrigerator.
- Place pet food in a soapy moat or coat the outside of bowls with Teflon™ spray (available in hardware stores).
- See Aphids in this guide for excluding ants from plants.

Resources

... continuation

Proper Use of Pesticides and Pest Identification:

- Santa Clara County Agricultural Commission office
(408) 918 4600
- U.C. Cooperative Extension
(408) 282 3110
<http://cesantaclara.ucdavis.edu>

Pesticide Safety:

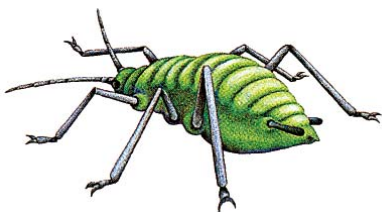
- Poison Control Center
(800) 662-9886
- National Pesticide Information Hotline
(800) 858-7378
- Water Pollution Prevention Information
(888) Bay-Wise
(888) 229-9473

Publications:

Sunset Western Garden Book ,Lane Publishing Co., Menlo Park, CA.

Less-Toxic Pest Management Fact Sheets,
Bay Area Stormwater Management Agencies Association

Tips for Waterwise Gardens, Santa Clara Valley Water District



DETECTION

Aphids are small (1/8"), soft-bodied insects that feed by sucking plant sap. They are often found in clusters. Look at growing tips, flower buds, and backs of leaves frequently during the growing season.

LESSTOXIC CONTROLS

- Wipe off small colonies with gloved hands.
- Pinch or prune off severely infested portions of the plant.
- Spray with insecticidal soap (available in nurseries). Always test a small portion of foliage before treating the entire plant. Some plants are very sensitive to soap sprays.
- Spray with highly refined "superior" or "summer" horticultural oils, which are fairly gentle on natural enemies (mix 4 teaspoons of oil in 1 quart of water).

PREVENTION

- Do not over fertilize because Aphids reproduce more quickly on plants with high levels of nitrogen in their leaves and buds. Use slow-release fertilizers such as compost, sewage sludge, urea-based fertilizers, or encapsulated materials.
- Exclude ants from Aphid-infested plants because ants protect Aphids from their natural enemies. Encircle woody shrubs or trees with sticky pastes or with Teflon™ tape (both are available in nurseries).