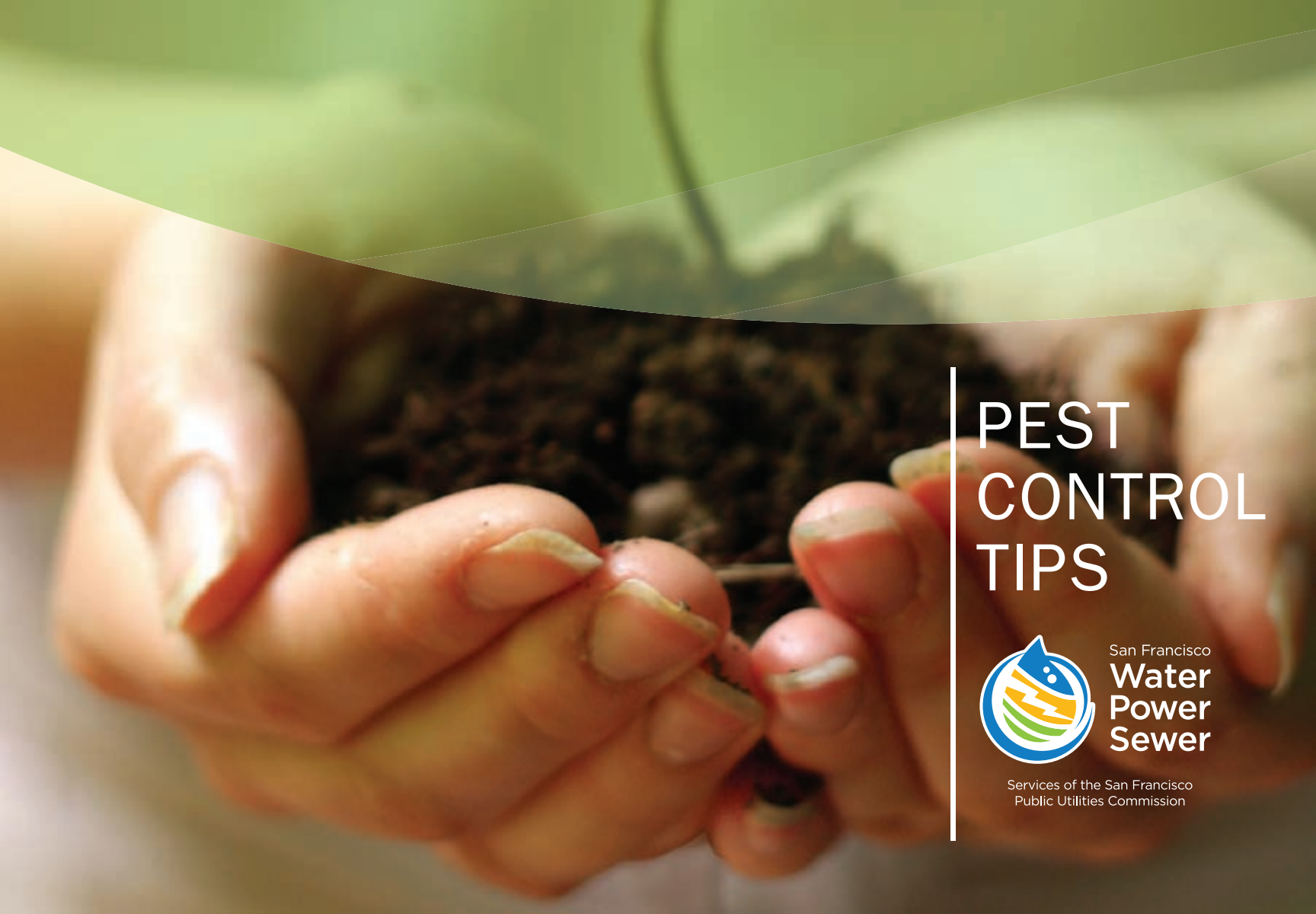


PEST CONTROL TIPS

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

SAN FRANCISCO'S CLIMATE ZONES

San Francisco's Microclimates

San Francisco has many microclimates, which depend on your distance from the ocean, what side of a hill you live on, and how high you live on a hill. The main determinant of your microclimate is the amount of wind from the ocean that reaches your location. This wind is cold and sometimes carries fog. Our three main microclimates are shown on the map below, but our real terrain is much more complex than the map, so your particular location may be warmer or cooler, sunnier or foggier than surrounding ones.

Main Microclimate Zones:

Zone 1 Fog Belt

Diamond Heights, Ingleside, Lake Merced, Richmond, Sunset, Parkside and West of Twin Peaks.

Zone 2 Transition Zone

Eureka Valley, Noe Valley, Marina, Excelsior, Glen Park, Haight, Pacific Heights and Western Addition.

Zone 3 Sun Belt

Mission, Telegraph Hill, Russian Hill, Bayview Hunters Point, Potrero Hill, Bernal Heights, Visitacion Valley and South of Market.

SELECT PLANTS FOR YOUR MICROCLIMATE

San Francisco has many microclimates that vary in the amount of fog, sun, temperature, and sea breezes they experience. Generally, the closer to the ocean you are, the less favorable conditions are for growing a variety of summer crops. Warm-season, sun-loving plants, such as peppers, tomatoes, corn, citrus, and melons may only be productive in the eastern, most sunny areas of the City. Flowers and vegetables labeled for full sun will grow better in the eastern side of the City than toward the west side. Those in the transition zone can vary in their productivity, often depending on annual differences in the overall number of sunny days in San Francisco that particular year. On the west side of the City, cool-season or shade-tolerant plants are likely to do best. Try herbs, lettuces, spinach, fava beans, greens, cabbage family plants, peas, or beets. Help plants out by providing a windbreak and protection from sea breezes.

Try to experiment and see what works for you. Individual plants within a variety may do better than others in your particular neighborhood.

Save seeds or cuttings from plants that perform well for you. For the best luck with the ever-popular tomato, use a cherry-type or early-season varieties that are indeterminate (produce fruit throughout the season).

NATIVE PLANTS FOR SAN FRANCISCO

Native plants are acclimated to our local conditions and, therefore, thrive in our climate. Once established, they will require little-to-no water and no fertilizer.

Annual wildflower seed mixes are excellent for attracting beneficial insects and can be readily purchased at local garden centers. Be careful not to plant invasive exotic plants. For more information, please visit the California Invasive Plant Council's website: **www.cal-ipc.org**.

The following plants tolerate full sun exposure to partial shade, and require little-to-no additional watering once established, unless noted with symbols: * The key is at the end of the list.

Perennials

Alum Root *Heuchera micrantha**
Beach Sagewort *Artemesia pycnocephala* ❍
Bleeding Heart *Dicentra formosa**/** ✚
Blue-eyed Grass *Sisyrinchium bellum**
Blue Larkspur *Delphinium decorum**
Buttercup *Ranunculus californicus**
California Beach Aster *Lessingia filaginifolia**/**
California Fuchsia *Epilobium canum**
California Larkspur *Delphinium californicum**
California Mugwart *Artemisia douglasiana*+
California Pipevine *Aristolochia californica* * ◗✚
Climbing Penstemon *Keckiella cordifolia**/**
California Poppy *Eschscholzia californica**
Checkerbloom *Sidalcea malvaeflora**
Chinese Houses *Collinsia franciscana**
Coast Rock Cress *Arabis blepharophylla***
Columbine *Aquilegia formosa**
Coralbells *Heuchera spp.**
Coyote Mint *Monardella villosa***+
Deer Grass *Muhlenbergia rigens*
Douglas *Douglas Iris**
Dune Tansy *Tanacetum douglasii*
Dwarf Coyote Brush *Baccharis pilularis***
Dudleya (sea lettuce) *Dudleya spp.*
Dunn's Lobelia *Lobelia dunnii spp.**/**
Elk Clover *Aralia californica*
Everlasting Cudweed *Gnaphalium canescens*
Fireweed *Epilobium angustifolium** ✚
Flat-Topped Goldenrod *Euthamia occidentalis*✚
Franciscan Paint Brush *Castilleja franciscana**
Franciscan Wallflower *Erysimum franciscanum*
Goldenback Fern *Pityrogramma triangularis*
Gumplant *Grindelia hirsutula**
Hairy Goldenaster *Heterotheca sessiliflora**
Heart-Leaf Pitcher *Sage lepechinia cordifolia**/**
Hummingbird Sage *Salvia spathecea**+
Johnny-Jump-Up *Viola pedunculata***
Lizardtail *Eriophyllum confertiflorum**
Maidenhair Fern *Adiantum aleuticum*
Monkey Flower *Mimulus var.**/**
Mugwart *Artemesia douglaiana*+
Multiflowered Snapdragon *Antirrhinum multiflorum**
Needle Grass *Poa var.*
Pearly Everlasting *Anaphalis margaritacea**
Penstemon *Penstemon var.**
Phacelia *Phacelia var.**/**
Popcorn Flower *Plagiobothrys chorisianus**
Potentilla *Potentilla var.**
Rein Orchid *Piperia elegans**
Rose Mallow *Hibiscus lasiocarpus** ✚
Rosy Buckwheat *Eriogonum rosense**
Rosy Pussytoes *Antennaria rosea**
San Francisco Campion *Silene verecunda*
Seepspring Monkey Flower *Mimulus guttatus** ✚
Silver Bush Lupine *Lupinus albifrons**/**
Soap Plant *Chlorogalum pomeridianum**
Stonecrop *Sedum spathulifolium***
Stream Orchid *Epicactus giganteum** ✚
Sun Rose *Helianthemum scoparium**
Tarweed *Hemizonia congesta**
Tree Mallow *Lavatera assurgentifolia**/**
Woodland Star *Limonium californicum**

Wooly Sunflower Eriophyllum lanatum*
Yarrow Achillea millefolium+*
Yellow Beach Lupine Lupinus arboreus**

Trees and Shrubs

Big Leaf Maple Acer macrophylla
California Bay Umbellularia californica+
California Buckeye Aesculus californica*
California Sagebrush Artemisia californica+
Chamise Adenostoma fasciculatum*+
Coffeeberry Rhamnus californica
Mock Orange Philadelphus lewisii+*/**
Manzanita Arctostaphylos spp.**
Vine Maple Acer circinatum
Wax Myrtle Myrica californica

Groundcovers

Beach Strawberry Fragaria chiloensis
Bearberry Arctostaphylos uva ursi ✚
Bentgrass Agrostis var.
California Honeydew Horkelia californica*
California Ponysfoot Dichondra donelliana
Sea Pink Ameria maritima*
Seaside Daisy Erigeron glaucus*
Yerba Buena Satureja douglasii+

(+) aromatic
(*) wildflower
(**) butterfly or hummingbird plant
❍ Needs full sun
◗ Needs part sun to shade
✚ Plant requires frequent water throughout the year

PESTS AND LESS-TOXIC ALTERNATIVES

Ants

Combat Quick Kill
Combat Source Kill
Grant's Kills Ants
Orange Guard
Safer Roach and Ant Killing Powder
Tanglefoot Pest Barrier
Terro II Liquid Ant Baits

Aphids

Bonide Rose RX 3 in 1
Bug Blaster
Concern Pesticidal Oil
Greenlight Neem
Greenlight Rose Defense
Insecticidal Soaps (e.g. Bonide, Garden Safe, Concern)
Ortho Volk Oil
Sunspray Ultra-Fine Oil

Cockroaches

Combat Quick Kill
Combat Roach Killing Gel
Concern Crawling Insect Killer
PIC Boric Acid Roach Powder
Roach and Insect Magnet
Roach Motel or Roach Prufe
Safer Crawling Insect Killer
Safer Roach and Ant Killing Powder

Fleas

Concern Crawling Insect Killer
Fleanix
Greenlight Bioganic Lawn & Garden*
Insecticidal Soaps*
*(will work on adult fleas and is only to be applied outdoors where pets may be lying)
Safer Crawling Insect Killer

Mealybugs

All Season's Oil
Concern Pesticidal Oil
Lily Miller Superior Type Oil
Monterey Safe-T-Cide
Ortho Volk Oil
Stoller Natur'l Oil
Summit Year Round Oil

Mosquitoes

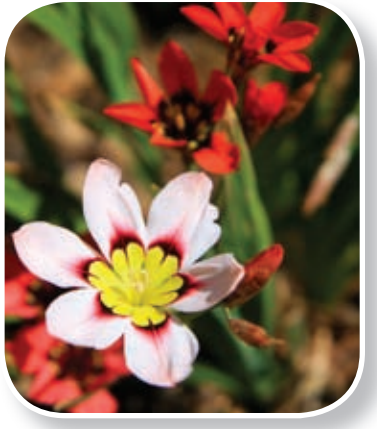
Bayer Mosquito Preventer Granules
Bonide Mosquito Dunks
Mosquito Bits
Prestrike granules (larvae control only)
Summit Mosquito Dunks
Vectobac

Mites

Bonide All Season's Oil
Bonide RX 3 in 1
Garden Safe Fungicide 3
Greenlight Neem
Greenlight Rose Defense
Lily Miller Superior Type Oil
Master Nursery Pest Fighter Oil
Ortho Volk Oil
Summit Year Round Oil
Sun-Spray Ultra Fine

Snails and Slugs

Bayer Dual Action Slug and Snail
Bonide Slug Magic
Copper Barrier Tape
Escargo
Garden Safe Slug and Snail
Sluggo
Worry Free



Whiteflies

Whitefly Sticky Traps
(see Mite Control Oil Products)

Yellowjackets

Traps

LESS-TOXIC ACTIVE INGREDIENTS

Active ingredients are listed on the front of the product. The following is a partial list of active ingredients found in products that are considered less toxic. For a complete listing, visit: **www.ourwaterourworld.org**.

abamectin
ammoniated soap of fatty acids
arsenic
(ONLY in containerized bait form)
Bacillus subtilis
Bacillus thuringiensis isrealensis
(will control larvae only)
borax
boric acid
canola oil
castor oil
citric acid
clove, rosemary, sesame and
thyme oil
corn gluten
d-Limonene
diatomaceous earth
eugenol
fipronil
(ONLY in containerized bait form)
gum resin
hydramethylnon
hydrophobic extract of neem
iron phosphate
Methoprene
(will control larvae only)
orthoboric acid
paraffinic oil
petroleum oil
potassium bicarbonate
potassium soap
(or salts) of fatty acids
sodiumtetraborate-decahydrate
soybean oil and cottonseed oil
vegetable wax

HELPFUL GARDENING TIPS

Seedling Care

Seeds can be started indoors beginning in February to get a jump on spring. Using plant lights will increase growth significantly. You can plant an early set of seedlings and then a later set in May to stagger harvest time of some crops.

- Always start with a sterile potting medium, such as a blend of perlite and peat moss. If you are re-using last year's seed pots, they should be sterilized with hot water or a mild bleach solution of one part bleach to nine parts water. Clean all tools and the surface that you use for potting.
- To evenly spread fine seeds, such as poppies, snapdragons, and pansies, first blend the seed with fine sand. The sand/seed mixture should then be sprinkled on the soil surface and gently watered in. Larger seeds are planted to a depth of about 2 times their width.
- Most seeds will germinate better and become heartier seedlings when the planting medium in the seed-starting tray is kept warm. There are many root zone heaters available to home gardeners.
- Allow the top of the soil to dry just slightly between waterings to prevent disease, help the roots get oxygen, and prevent root rot. Thin out seedlings with tweezers when they start to crowd each other. This increases air circulation, which is key to preventing diseases such as damping off or gray mold. Quickly remove any leaves, or entire small seedlings, if they show signs of disease.
- Seedlings should not remain in their seed-starting container after they have grown two sets of true leaves, or roots have grown out of the bottom of the container. The first leaves that emerge are actually not true leaves, but are called cotelydons.
- Seedlings may be fertilized at this time with a slow-release or organic fertilizer, such as seaweed extract or fish emulsion.
- Seedlings and young plants set outside in late spring and summer are favorite foods for snails, slugs, earwigs, and caterpillars. Use copper tape placed in a circle around seedlings or the bottom of pots to deter slugs and snails. Floating row covers provide an excellent caterpillar and bird barrier.
- If damping off starts to occur (rotting of the stem at the soil surface), increase air circulation around the seedlings. Prop up the seed tray cover and direct a small fan toward the seedlings. Try not to apply water directly on the seedlings and allow the soil in the tray to dry on the surface between waterings.

GENERAL GUIDELINES

- Always identify your pest first. For large holes, look for signs of droppings, or hunt at night with a flashlight. Look on leaf undersides usually for a sucking pest, and take a sample to your local garden center in a sealed bag for disease identification.
- When releasing insects such as ladybugs or lacewings, make sure your ant population is under control. A sticky barrier around the main trunk or stalk will prevent ants from moving up and down the plant and attacking beneficial insects.
- The best time to release ladybugs is around dusk or before dawn. Water the area beforehand, and keep the insect container in the refrigerator before release. They will be less active and not fly away as readily.
- When using nematodes (to control lawn beetle grubs, fleas, cutworms, and most insect pests that live in the soil), water them into the lawn as soon as possible, but never during the heat of the day. Evening is best.
- Lacewing larvae are the most effective beneficial insects for managing sucking pests (i.e., aphids), as they will not fly away like ladybugs and they will consume a broader range of insect pests, including mites, thrips, small caterpillars and more. Ladybugs are excellent for greenhouse applications, and commercially available ladybug lures will help encourage them to stay in place for outdoor releases.
- Encourage beneficial bugs to visit your garden by planting flowers that attract beneficial insect. Here's a list of a few flowers that will attract beneficial bugs to your garden:

  Calendula (Calendula officinalis)
  Alyssum (Ocimum basilicum)
  Marigold (Tagetes sp.)
  Purple Coneflower (Echinacea purpurea)
  Yarrow (Achillia sp.)

RESOURCES

CA Department of Pesticide Regulation
www.cdpr.ca.gov
Type in “beneficial insects” in the site’s search window.

Peaceful Valley Farm Supply
Grass Valley, CA
www.groworganic.com
1-888-784-1722

Pesticide Action Network, North America
www.panna.org
PANNA maintains an excellent database of problem pesticides and fungicides.
www.pesticideinfo.org

San Francisco-San Mateo Co. Extension Service
http://cesanmateo.ucdavis.edu
1-650-726-9059

University of California Integrated Pest Management Program
www.ipm.ucdavis.edu
An excellent resource to learn how to manage pests.

PLANT DISEASES (MOLDS, FUNGI, & MICROBIAL INFECTIONS)

Molds and fungi are common problems in our foggy climate, especially for cucumbers, squash, legumes, dahlias, and roses. Fruit trees and tomatoes are also susceptible to blight and other plant diseases. Bring an infected leaf sample in a sealed clear plastic bag to your local garden center for proper identification.

- Powdery mildew causes a white splotchy growth on peas, beans, squash, cucumber family plants, dahlias, roses, and many other ornamentals, or yellow patches on tomatoes and peppers. Unlike mold and fungus, powdery mildew thrives on cool, dry conditions. Remove infested leaves and leaf litter around affected plants. Control can be accomplished with many commercially available non-toxic organic sprays, such as neem oil. A mixture of one teaspoon of baking soda and two teaspoons of horticultural oil in one quart of water will help control outbreaks. Spray water on leaf surfaces in the morning to suppress the cycle of spore releases from the fungus. Make sure to distinguish powdery mildew from downy mildew (see below), as treatment is very different.

Common Treatments For Other Plant Pathogens

- Downy mildew requires moist, humid conditions. It causes angular purple, red, or brown spots on leaves (usually along the veins) that will eventually cause the leaf to turn yellow and drop. On the underside of the leaf where lesions appear, white to gray spore masses can be observed.
- Molds can affect almost any plant tissues, can range from white to black, and can vary in appearance from shiny and smooth to the more familiar fuzzy form. Black spot, mostly a disease that affects roses, produces black spots with feathery or fibrous margins on the upper surfaces of leaves and stems. Small black fruiting bodies are often present in spots on the upper sides of leaves. There is no fungal growth on the undersides of leaves.
- Abiotic disorders (not caused by biological agents such as insects or mites) may look like a plant disease, but generally have more to do with nutrient deficiencies. They are common with our sandy soils. Nitrogen deficiencies make leaves turn yellow and eventually drop. Apply organic

fertilizer such as fish emulsion, kelp meal, or blood meal. Iron and zinc deficiencies cause yellowing along leaf veins. Use a product containing chelated zinc or iron. Bring an affected leaf to your local nursery, to accurately diagnose the problem as well as test the pH of your soil.

General Guidelines to Minimize Diseases

- Use a foliar spray of compost tea. The tea introduces beneficial organisms to the plant surface which compete with disease organisms. Compost for making tea can be purchased at most garden centers, or made at home.
- Remove severely diseased leaves and stems as soon as you notice them. Clean up leaf litter around diseased plants frequently as well.
- If nearly an entire tree or shrub is diseased, prune off infected portions immediately. Always rinse tools in a hot soapy solution or rubbing alcohol after trimming diseased plant tissue and before the final cut, below the infection, into healthy wood.
- If an area of your garden is significantly affected by disease, rotate entirely different families of annual flowers, vegetables, and bulbs into that area next season.
- Tie up vegetable plants such as tomatoes, peppers, and beans so that the fruits are not touching the ground. Place a piece of cardboard under each forming vegetable on vine vegetables (pumpkin, squash, etc.).
- Prune out interior growth on plants to provide maximum air circulation. Tie up those plants that need staking in ways to prevent dense interior leaf crowding.
- To avoid plant damage, test spray on a small part of the plant first and watch for damage before spraying the remainder of the plant. Avoid spraying during especially hot days. If a plant gets a fungal disease every year, consider removing it and replacing it with a more climate appropriate plant.

Aphids and Other Tiny Pests Detection

Many tiny insects feed on plant juices and may not be noticed until they cause serious plant damage. Early detection is key. Instead of eating holes in plants, these pests suck juices from the plant and can limit flowering, fruit production, cause irregular looking leaves and buds, or transmit plant diseases.

- Aphids are small (sesame-seed sized) green, yellow, red, or gray soft-bodied insects often found in clusters on growing tips, flower buds, leaf undersides and enclosed plant parts. Unchecked, aphids can stunt plant growth.
- Whiteflies, resembling white ash flakes, occur on the underside of leaves and cause yellowing, silvering, or tiny black spots and will fly up in a cloud when the plant is disturbed.
- Scale insects, which stunt growth, generally prefer woody plants and resemble small waxy scales on stems and twigs. Thrips and mites (below) are hard to spot with the naked eye. Look closely at dead or dying leaves with a hand lens to identify.
- Thrips feed within buds, furled leaves, and enclosed plant parts. Their damage is often observed before they can be seen. Discolored or distorted plant surfaces or tiny black specks of feces resembling a black sooty mold are most commonly associated with thrips.
- Spider mites look like tiny black dots that cause leaf curl and some light stippling of leaves (i.e., yellow speckling along edges). Look for very fine spider web-type silk under affected leaves. For further help identifying pests, visit: **www.ipm.ucdavis.edu** or take an infected sample in a sealed plastic bag to your local garden center.

Less-Toxic Controls

Tiny insect pests are generally controlled the same way. For chronic problems, rotate plants, consult a garden professional, or if the pest is symptomatic of local environmental factors, consider growing a different plant or crop.

- If you only find a few, simply squash the aphids, whiteflies or scales as you find them with a gloved hand.

- If you spot a colony of aphids or whiteflies, spray it off with water from a hose. Support delicate plants with your hand when rinsing leaf surfaces. This is not effective for spider mites and thrips, which are hard to locate and don't form tight colonies.
- Pinch or prune off badly infested portions of the plant. Consider pruning larger plants open so that birds and predatory insects can reach the pests.
- Blue or yellow sticky traps will help with identification and control of whiteflies, thrips, and flying aphids.
- Yellow sesame-seed sized eggs under leaf surfaces are probably cabbage worm eggs and should be crushed. These may look like aphids, but they adhere strongly to leaves and cannot be easily washed away with water.
- The products listed below control on contact, so make sure to spray the undersides of leaves where these bugs tend to colonize. Any sprays (even non-toxic) should be tested on a small portion of the plant first to check for sensitivity. Wait two days for signs of spray damage. Follow all label instructions.
- Spray with insecticidal soap containing only potassium salts of fatty acids. Make sure to soak enclosed parts of plants (such as a forming cabbage head). Rinse treated plants with water within 2 days to remove carcasses, which can harbor mildew and other diseases.
- Spray with a summer oil, preferably a vegetable oil-based spray or a neem oil, which offers the additional benefits of fungicidal activity.

Prevention

- Do not over-fertilize. Aphids, whiteflies and scale insects are attracted to new growth encouraged by quick-release, high-nitrogen fertilizers. They will also reproduce faster by feeding on the excess plant sugars these fertilizers induce. Use slow-release or organic fertilizers such as compost, fish emulsion, or kelp meals.
- Be sure plants are not under-watered, as this makes them more attractive to these tiny pests.
- Ants feed on the honeydew that aphids, whitefly nymphs, and scale insects produce while they suck on plant juices. Therefore, ants protect these garden pests from their natural enemies. Wrap the tree trunk or plant stalk with brown paper, then apply a sticky barrier over the paper to prevent the ants from moving from the soil and up into the plant. Outdoor ant stakes offer control as well.
- Beneficial insects, such as lacewing or ladybug larvae, feed on these tiny pests. Release them in the garden before problems arise. Encourage these natural predators with plants that attract them, such as the wildflowers listed on the front page of this tip section. Garden centers can also advise you.

Pests That Chew Holes in Plants or Devour Seedlings

Slugs, Snail, Earwigs, Caterpillars, and Some Beetles

There are four common types of garden pests that tend to chew holes in leaves, eat chunks out of the leaf edges, eat holes in berries, or devour entire young seedlings: caterpillars, snails/slugs, and some beetles and earwigs. Early detection is essential for establishing a control method.

Detection

- Upon early signs of damage, look for signs of a mucous trail, which would indicate that a snail or slug is the culprit.
- Go out after 10 p.m. and examine damaged plants with a flashlight. Snails, slugs, and earwigs actively feed after dark.
- Look for droppings (frass) left behind by these pests for proper identification. Earwigs leave tiny black droppings resembling poppy seeds. Caterpillars will leave behind green to brown piles of barrel-shaped frass. Snails leave long, coiled droppings on leaves or the ground.

- If you notice the common white or yellow butterflies present in your garden, start to inspect the underside of leaves (especially crops in the cabbage family) for eggs about once a week. Moths, which are active after dark, will lay yellow-to-tan colored objects slightly smaller than a sesame seed, which strongly adhere to leaf surfaces. Crush them as you encounter them.
- Plants, such as peas or beans that have numerous small holes (i.e., they look as though they were hit with a shotgun or are skeletonized) are showing signs of beetle damage. Be careful, some beetles look similar to beneficial ladybugs.

Prevention

- For new transplants and seedlings planted in beds, cover the entire area with a layer of thin opaque material (floating row cover). Allow enough slack for plants to grow, and secure the material around the edges.
- Copper tape repels snails and slugs. Wrap pots, planter boxes, trees, and beds with a band, or encircle seedlings with a ring of the tape. Re-use scrap bare copper wire by using multiple strands in the same way you would use the copper tape.
- Clean up leaf litter and other objects that harbor earwigs and snails.
- Start seedlings indoors and move them outside when they are large enough to withstand some damage.

Control

Once you've identified the troublesome pest, you can start a program of control or eradication:

- For snails and slugs, the best method is to remove them, hand-picking, at nighttime with a flashlight. If the infestation is especially bad, consider using a less-toxic bait such as Iron Phosphate (Sluggo TM). The snails and slugs ingest the bait, and crawl back to their hiding spot where they desiccate and die. You will not see dead shells where the bait is applied, but the toxic baits that cause snails to die on the spot contain metaldehyde, which is poisonous to pets, people, and wildlife.
- For early control of caterpillars, when damage is minimal, handpick those you can find. If the infestation is especially bad, use a spray containing Bt (bacillus thuringensis sp.), an active bacterium that leaves caterpillars unable to eat by reproducing inside their bodies.
- For earwig control, first hand-pick and remove earwig hiding places. Only if necessary, use diatomaceous earth which provides less-toxic control. It is a product made from the skeletons of ancient microorganisms (diatomes) and causes the insect to desiccate when it encounters the substance. Use a duster (an old talcum powder bottle works very well) to coat pest hiding places with the dust. Look under rocks, cement pavers, and boards around the garden for their hiding spaces. A small container with beer in it partially buried in the soil is also an excellent non-toxic monitoring tool for earwigs.

SOIL-BORNE FUNGI

Detection

There are several major strains of bad soil fungi that tend to give gardeners the most problems. Diseases associated with root rot and damping off are generally associated with overwatering or poorly-drained soils, often causing the soil to smell foul when disturbed. Plants will be stunted, leaves will redden, new shoots will die off but not drop (flagging), and rot will move from the root crown into the canopy. Gray mold (botrytis) forms a gray fuzz on berries (especially strawberries) and on the stems of vegetable plants that can readily spread spores. The fungus causes blights and tulip-fire (a browning of tulip flowers and leaves). Anthracnose is a fungus that will leave tan to dark brown water spots on foliage and brown lesions on fruits and vegetables. The leaf spots will become papery thin and lesions will develop tiny black fruiting bodies.

Less-Toxic Controls

- For root rot, increase aeration in the soil by adding a light mulch and allow some drying between watering.
- Eat your harvest of fruit promptly (when it tastes best), or place in cold storage until needed.
- Remove infected plant parts, pruning back to healthy tissue.
- Completely remove badly infected plants and avoid re-planting that location with plants known to be susceptible to the observed disease.
- After harvest, remove leaf litter and dead plants to prevent over-wintering of fungi.
- Clean hands and cutting tools after handling infected plant materials.
- Use less-toxic sprays including horticultural oil, neem oil, sulfur, or sulfur-lime based mixtures. Always read the product labels and take the necessary precautions.
- Avoid overhead watering (i.e., sprinklers) for most plants, and install drip irrigation along the 'drip-line' of the plant.
- When transplanting, do not bury the root crown.
- Prune plants open, removing crossing branches to improve air circulation around branches and leaves. Fungus often starts where branches or leaves are crowded or touching.

Prevention

- Use healthy compost and compost tea to supply the soil with good microbes.
- Plant in raised beds to increase drainage.
- In containers, always use sterile potting mix. Plant spreading plants, like strawberries, with the crowns near the top of the pot.
- If you have repeated disease problems, rotate plantings of susceptible plants to different parts of your garden. For example, rotate nightshade-family plants (such as potatoes and tomatoes) out of beds that have had a previous infection, which has affected nightshade-family plants.
- Read nursery plant labels and planting guides to select disease-resistant plants.
- Do not allow fruits to remain on the plant past the 'ripe' stage; once 'over-ripe,' fruit can become a vector for infection.
- Avoid quick-release, high-nitrogen fertilizer.
- If possible, avoid reusing infected soil in your garden, especially in containers.

THOSE PESKY LITTLE ANTS

Those tiny ants that have become a nuisance in the home and garden are Argentine ants, believed to have been brought into Southern California on ships carrying coffee and sugar from Argentina about 100 years ago. Now the ants have formed a continuous mass of colonies, or "super colony," that extends from San Diego to Ukiah. Learn to tolerate some ants around the garden as they provide a benefit to decomposition and soil formation.

Detection

Argentine ants are small (1/8") long and dark brown in color. They are found in the garden usually on and/or around plants, shrubs, and trees in search of honeydew-producing insect pests. In the home, ants are in search of water and food as well as cooler conditions in the summer, or drier warmth in the winter.

Prevention

In the garden

- Become familiar with less-toxic prevention methods for aphids and other tiny honeydew-producing pests.
- Do not allow fallen fruit to remain on the ground.
- When using a sticky barrier, trim back trees and shrubs from touching other structures that would allow ants a pathway onto the plant other than the trunk.
- Cedar mulches can prevent nesting.

In and around the home

- Caulk up cracks and crevices that would allow the ants an entryway.
- Sanitation is very important. Empty trash often, and rinse residues from recyclables. Store sweet items and pet foods in sealed containers.

- If ants are eating food from your pet's dish, put the dish in a water-filled baking pan or something that can provide a moat around the dish.
- If only a few ant scouts are noticed, squash them or vacuum them up and wipe around the area with a soapy sponge to eliminate the scent trail. Avoid panicking and reaching for sprays.

Less-Toxic Controls

Once you've identified the troublesome pest, you can start a program of control or eradication:

- A simple solution of dish soap and water (1–2 teaspoons per quart of water) in a spray bottle will kill the ants and can be used to wipe up their scent trails.
- Follow methods to control honeydew-producing insects. A sticky barrier (Tree Tanglefoot™) on trunks of trees and shrubs will prevent ants from moving up and down the tree. Refresh the sticky barrier every week or two. Wrap the trunk with paper and apply the barrier over top.
- In potted plants, if soil is infested with ants, submerse the entire pot in a bath of soapy water for about 20 minutes and then rinse.
- When infestations are discovered in dry soil, dust with a coating of Diatomaceous earth to reduce their numbers.
- Use commercial baits. Some tips for using baits include:
- Boric acid-based baits are presumed to be the least toxic to the environment (Terro is a common store brand). Place the stations along the ant trails.
- Avoid granular products that are broadcast-applied around foundations. They are contact poisons that may end up polluting run-off water.
- Allow the ants to feed on the bait station for a few days so that the colony is destroyed. Do not spray repellents around baits.
- If a sweet-based bait is not working, try a different one, as the ants sometimes change food preference.
- Clean up other potential food and water sources around baits.
- Once ants have stopped feeding off the baits, remove the bait to avoid attracting new ants. Place the remainder of the bait in a sealed bag or container for reuse.
- In the house, try to find ants' entryways on the outside of the house and place the bait there while caulking the interior hole. If you can only find the entry point inside the house, wait to caulk over the hole until the ants are no longer present and feeding on baits.

TREE CARE BASICS

Compliments of Friends of the Urban Forest (www.fuf.net)

Not only are trees beautiful and help to make our urban environment more pleasant, but they also offer many environmental benefits, including: moderating climate, improving air quality, reducing flooding, providing habitat for wildlife, and conserving water.

Visit **www.treesaregood.com** for more tree facts.

Why do the leaves of my tree have brown edges?

Brown edges are often simply windburn. This is caused by our coastal wind drying out the edges of the leaves. More water can make up for the drying factor of wind. The leaves of deciduous trees will often look "tired" in the fall, as they are getting ready to drop. Just wait and watch. Fresh new leaves should emerge in spring.

How can I make the roots grow straight down?

Roots don't generally grow straight down. The carrot-shaped "taproot" is a myth for most mature trees. For maximum stability, roots should grow outward from the trunk at a downward angle. They typically grow in the top 2 feet of the soil, where the water and nutrients are. You can encourage them to grow deeper by watering with a slow drip, such as a hole in a water bucket. Doing this lets the water penetrate the soil more deeply. Move the water source regularly to get the entire root ball. Soil type also affects how roots grow. Roots will have an easier time going deeper with sandy soil and a harder time with clay. FUF does plant some species with 18" root guards, which detour roots downward. They may eventually U-turn after some years. Root guards are not recommended with every tree, as they can affect the stability of the tree.

Should I "feed" the tree with fertilizer?

Trees "eat" light. Fertilizers are more like vitamin supplements, and they aren't always necessary. Chemical fertilizers can't be fully absorbed by the plant, so those chemicals end up in the groundwater. Excess nitrogen makes the soil too acidic and hard to work with. Be sure you really need to fertilize. If you have soil with clay and/or silt content, it should not need fertilizer. Regular addition of organic matter like mulch should be enough. Sandy soil is very low in nutrients, so adding organic fertilizer once a month or so can help. Organic fertilizer is slow to release, so the plant can take it up. Examples include seaweed powder and fish emulsion.

How can I prevent roots from getting in my utility pipes?

Roots cannot break into pipes that are sound, but do exploit cracks, holes or weaknesses. Many old sewer pipes are terra cotta, the same material as flowerpots. Over time, they develop cracks, and roots will take advantage of those to go after water and nutrients. Consider replacing an old terra cotta sewer pipe with a more stable, modern material.

What's wrong with topping a tree?

Each tree has a genetic plan for its growth. You'll see that the trunk and branches start out thick at the bottom, then taper off to be thin at the top. Each species grows in a way that is right for itself. A good pruning job respects the shape of the tree while gently training it to be as safe and non-intrusive as possible. When the tree is topped, the internal plan is ruined. The tree is forced to survive by sprouting wherever it can. The new sprouts are crowded and weakly attached, and if allowed to develop, become more hazardous than the original branches. In addition to looking unnatural and unattractive, it is more expensive because you'll need to prune it again much sooner and more frequently if you keep topping. A natural pruned look is easier to maintain, saving you money and time.

How come FUF doesn't take care of large trees?

To work on large trees in a safe and professional manner, we'd need a lot more equipment, staff, training and insurance. FUF just can't send a volunteer up a rope with a chainsaw! So FUF refers people to the professionals for larger jobs.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
1155 MARKET STREET, 11TH FLOOR
SAN FRANCISCO, CA 94103