

COMBATting WHITE GRUBS AND THE URBAN WILDLIFE THAT LOVES TO DIG THEM UP

If your lawn appears to be dead in patches or feels spongy, or if raccoons or possums have been rolling up your turf like a carpet, you might have white grubs. Or you might not!

Drought can cause grass to go dormant or die in patches. Dog urine can cause yellow spots in a lawn. Hungry birds, moles, raccoons, opossums, and skunks may dig in the turf looking for tasty grubs, but they might not find them. Before you take action against grubs, you should verify their presence in several places.

Identifying grubs

White grubs are an immature stage of several kinds of beetles that feed on grass roots. Grubs are C-shaped, up to an inch long, and often white with a brown head and three pairs of legs.

Dig around grass roots where you suspect grubs. In late fall through spring, look for whitish to yellow, wrinkled, C-shaped grubs. Look for yellowish-brown adult beetles in early to mid summer. You probably won't see damage from grubs on the surface of your lawn until June or later—when the grubs have grown into beetles and finished eating for the year.



Controlling grubs

- The best approach to grub control is to maintain a healthy lawn without using insecticides. Be sure your lawn is well drained and not compacted. Healthy lawns can recover more easily from white grub damage.

- Plant warm-season native grasses (see *Some Preferred Grasses for California*), which are more tolerant of white grubs than cool-season ryes or fescues.
- If you do end up with a large grub infestation (more than six grubs per square foot of lawn), products with azadirachtin can be used to control immature grubs. Apply these products early in the season when grubs are small and close to the soil surface. Mow the lawn before applying, so that the maximum amount of material will reach the root area. You may need to reapply.
- Don't treat in mid spring or later, when you find dead patches of turf. By this time grubs have done all their damage for the season and are ready to stop eating. Remove the dead grass, loosen the soil, and reseed the area.

Control grubs with beneficial nematodes

- Apply beneficial nematodes (*Heterorhabditis bacteriophora* or *Steinernema glaseri*) in late spring before adult beetles emerge, or in mid summer to early fall. Nematodes must be applied when the soil temperature is between 60°F and 90°F and the soil is moist. Nematodes need moisture to move around in the soil and to prevent their bodies from dehydrating. Water the soil before and after application, but don't soak the area. Apply nematodes in early evening to minimize damage from sunlight. Avoid using fertilizers two weeks before and two weeks after the application.
- Buy nematodes from your nursery or garden center, which will order them for you if they are not in stock. Or, order them online. To make sure nematodes are alive, place a small quantity of the nematode-containing material in water and watch closely to see if they are moving. Nematodes are very small, so you may need a magnifying glass to see them.

For more information about lawn pests in California, see: www.ipm.ucanr.edu/QT/lawninsectscard.html. For more information about beneficial nematodes and how to apply them, see: www.ipm.ucdavis.edu/TOOLS/TURF/PESTS/innem.html.

Pest control strategies and methods described in this publication are consistent with integrated pest management (IPM) concepts, and are based on scientific studies and tests in actual home and garden settings. Use suggested products according to label directions and dispose of unwanted or leftover pesticides at a household hazardous waste collection facility or event. For more information on pesticide disposal, visit www.earth911.com. No endorsement of specific brand name products is intended, nor is criticism implied of similar products that are not mentioned.

For more information, contact:

Bio-Integral Resource Center (BIRC), 510.524.2567, www.birc.org
University of California Cooperative Extension Master Gardeners in your area
University of California IPM website, www.ipm.ucdavis.edu

TIPS FOR A BEAUTIFUL, HEALTHY LAWN

GROW A HEALTHY LAWN WITH THESE ECO-FRIENDLY PRODUCTS

Slow-release and organic fertilizers	Organic fertilizers (Ringer Lawn Restore, Dr. Earth Lawn Super Natural Organic Lawn Fertilizer, E.B. Stone Nature's Green Lawn Food, Bradfield Luscious Lawn Organic Fertilizer), Vigoro Lawn Fertilizer
To kill immature grubs (azadirachtin)	Safer Brand Grub Killer concentrate (for hose-end application)
Beneficial nematodes (<i>Heterorhabditis bacteriophora</i> or <i>Steinernema glaseri</i>)	Buy nematodes from your nursery or garden center, which will order them for you if they are not in stock. Or, order them online.
Mechanical dandelion puller	Fiskars UpRoot Weed and Root Remover
Soil analysis laboratories	Ask your nursery or garden center for a recommendation, or contact your county agricultural extension office (see http://ucanr.edu/County_Offices/)

PLANTING A NEW, MORE DROUGHT-TOLERANT LAWN

Start out with the right seed or sod

- For lawn species that need less water than traditional turf varieties, see the list of preferred grasses for California inside.
- Do some research before you decide what grass species to plant. See the list inside, and two helpful publications from the University of California: www.ipm.ucdavis.edu/PMG/r785900111.html, and www.ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/index.html. Choose a mixture of grasses suited to your climate and the conditions in your yard.
- When installing sod, be sure to choose sod that has been propagated in conditions similar to your own.
- Consider having your soil professionally tested so you can choose grass that matches your soil's texture, pH, and salt and nutrient levels.

Prepare the soil before you plant

- Don't work the soil when it is very wet. You can damage its structure.
- Break up all dirt clods into fine particles and remove pebbles and stones.

Check out some of the excellent sources of information on keeping your lawn healthy, such as the University of California Integrated Pest Management Program, www.ipm.ucdavis.edu/PMG/menu.turf.html, and Beyond Pesticides, <http://beyondpesticides.org/lawn/factsheets/index.php?pid=295>.

- Thoroughly mix soil layers of different textures, down to at least six to eight inches, before planting. Poor soil preparation can cause poor drainage and weaken the turf.
- Check for low spots by irrigating. Smooth out or fill in areas where you see puddles (very important if you are seeding a lawn).

Water a new lawn with care

- Until grass becomes established, keep the soil in your newly planted lawn thoroughly moist, but not too moist. Too much water can wash away seeds or drown young plants.



WWW.OURWATEROURWORLD.ORG

Common home and garden pesticides are found in stormwater runoff, treated wastewater, and in local waterways, sometimes at levels that can harm sensitive aquatic life. Our Water Our World is a joint effort by water pollution prevention agencies, participating retail stores, and pesticide distributors and manufacturers—working together to reduce the risks associated with pesticide use.

Our Water Our World fact sheets and store displays educate residents about less-toxic pest management. For the rest of the series of fact sheets, visit www.OurWaterOurWorld.org. Look for the **Less Toxic • Eco-friendly** tag next to less-toxic products in participating stores and nurseries. See the *Pesticides and Water Pollution* fact sheet for information on active ingredients in common pesticides that may cause water quality problems.



Choose eco-friendly products for your home and garden. Look for this symbol before you buy.

WHAT'S IN A LAWN?

If you don't need an even, all-grass surface, you can replace all or some of your lawn with an attractive alternative that needs less water and less mowing, and attracts helpful pollinators to your garden.

Drought-tolerant lawn substitutes

- **Woolly Yarrow** (*Achillea tomentosa*): Plant from flats or small pots, 6" apart; mow in March and July to a height of 2". Yellow flowers. Keep soil on the dry side.



- **Caraway-Scented Thyme** (*Thymus herba-barona*): Plant all thymes from flats or small pots, 6" to 8" apart. Mowing is not necessary. Rose-pink flowers in early summer attract bees.



- **Creeping Thyme** (*Thymus praecox-arcticus*): Mow to 1 1/2" in July and fertilize; purple flowers in summer attract bees.



- **Strawberry Clover** (*Trifolium fragiferum*): Plant from seed in fall; mow to 2" in April, June, and August; white to pink flowers in summer attract bees.



- **Garden Chamomile** (*Chamaemelum nobile*) combined with strawberry clover: Plant chamomile from flats or from small pots, 6" to 8" apart. Interplant with strawberry clover and mow both ground covers to 2" in April, June, and August. In areas with heavy clay soils, chamomile may not grow. In those spots, combine the clover with either of the thymes listed above.



CARING FOR AN ESTABLISHED LAWN

Water—just enough!

- **Don't overwater.** Check the soil moisture with a trowel. The top two to three inches should feel almost dry before you add more water.
- **Water enough to send the roots deep into the soil.** When you think you've watered enough, push a trowel into the soil and tilt it forward. If the soil isn't damp down to four or six inches, keep watering until it is. Keep track of how long you water, for next time.
- **Water slowly so that water stays on your lawn and doesn't run off.** Overwatering is one way pesticides and fertilizers find their way to storm drains.
- If water runs off or pools even with slow irrigation, your soil may be compacted—which makes it hard for healthy roots to grow. See *Restoring a lawn to health* for tips on addressing this problem.
- **Know your soil type.** Clay soils hold more moisture and dry out more slowly, and need less frequent watering. Sandy soils dry out faster.

Grass clippings: Home-grown fertilizer

Unless your soil is very sandy, you should not need to add fertilizer (nutrients) to your lawn.

- Grass clippings left on the lawn after mowing can provide most of the nutrients your lawn needs. Clippings must be small enough to decompose quickly without forming a mat on top of the living grass. See *Mowing a healthy lawn*.
- Synthetic or quick-release fertilizers, if misapplied, can "kill" the soil by killing the good bacteria and destroying the supporting soil structure.
- If you do need to feed your lawn, use organic or slow-release fertilizers such as sulfur- or polymer-coated urea.

Mowing a healthy lawn

- **Mow when the grass is dry.**
- In general, **cut no more than 1/3 of the leaf blade when you mow**, and keep mower blades sharp. Cutting off too much or wounding grass with a dull blade stresses the lawn and invites pests and diseases.
- **During warm weather months, cut the grass higher** to help the soil hold onto water.
- **Change your mowing pattern or direction often** to avoid compacted mower tracks.
- If blades of grass are turning yellow and orange powder comes off onto your hands, your lawn has rust disease and you should collect lawn clippings and throw them away. Control and prevent rust with good lawn care practices, including fertilizing with organic or slow-release fertilizers.

DEALING WITH WEEDS

A completely weed-free lawn is... unnatural! But a healthy lawn will crowd out most weeds. Think about how many weeds you can tolerate.

- **Dig weeds by hand before they go to seed, and try to pull out the roots.** A forked-end hand weeder picks up weeds such as dandelions by the crown so that the long tap root comes too. There is also a foot-powered, stand-up tool that works well.
- **Reseed bare spots** so weeds can't fill in. Sprinkle grass seed and water regularly with a fine spray until grass sprouts.
- **Don't mow grass too short.** Taller blades can shade the soil enough to prevent some weed seeds from sprouting.
- **Avoid weed-and-feed fertilizers** because the herbicides in these products may drift to other parts of your garden, and in some cases even kill shallow-rooted trees.

RESTORING A LAWN TO HEALTH

A healthy lawn needs air, water, and nutrients reaching the roots. An old or neglected lawn, or one that gets heavy use, may have a thick layer of thatch, or the soil may be compacted so that roots cannot grow well.

Give it air!

A lawn's root system needs air to grow, and grow deep into the soil. If you can't push a screwdriver five or six inches into the soil, or if water pools on the surface, you should aerate your lawn. Areas where there is heavy foot traffic or where grass looks thin are good places to check.

- **Use a hollow-tined aerator that removes plugs of soil.** Aerators can be foot-operated or motorized, and rented from hardware stores or borrowed from tool libraries.
- For best results, **aerate during your lawn's strong growing season.**
- **The day before you aerate, water the lawn until the soil is moist five to six inches deep.** This will help you push the aerator deeper.
- **Leave the plugs on the lawn.** When they have dried out, break them up with a rake.

Removing thatch

Thatch is a matted layer of living and dead grass stems and roots that can build up between the green blades and the soil surface. A half-inch of thatch can help your lawn retain moisture and block weeds, but a thicker layer can keep air and water from reaching the roots. If your lawn has a bouncy feel when you walk on it, thatch is probably building up. Aeration can help with thatch.

- Thatch is less likely to build up in a healthy lawn on biologically active soil. This is another good reason not to use lawn chemicals that can destroy soil organisms!
- The best time to remove thatch is during the active growing season, when grass will recover more easily.
- Before you de-thatch, mow the lawn a little closer than usual. If the lawn is very dry, water thoroughly the day before.
- If your lawn has a thicker thatch layer than aeration can handle, you may need to de-thatch with a special thatching rake or a "vertical mower" (which you can rent).
- Water well after de-thatching; aerate if necessary; and throw away thatch in your green waste bin.

SOME PREFERRED GRASSES FOR CALIFORNIA

"Cool season" native bunch grasses (growing season is during cool weather)

- **Blue wild rye** (*Elymus glaucus*): Spreading habit, good soil stabilizer for slopes
- **Creeping wild rye** (*Leymus triticoides*): Sod-forming, spreading, dependable groundcover
- **California fescue** (*Festuca californica*): Good in filtered shade
- **Giant needlegrass** (*Achnatherum coronatum*): suited to dry, sunny areas
- **Seashore bentgrass** (*Agrostis pallens*): Also called San Diego or dune bentgrass; also Native Bentgrass™

"Warm season" grasses (growing season is during warm weather)

- **St. Augustinegrass** (*Stenotaphrum secundatum*): Most shade-tolerant of warm season grasses
- **Buffalograss** (*Buchloe dactyloides*): Cannot tolerate shade, dies back in winter. UC Verde™, developed by the University of California, has a longer growing season than other varieties
- **Blue Grama** (*Bouteloua gracilis*): Good in hot, dry areas; has a brief dormant season in cool weather

Sod

- See www.deltabluegrass.com for trademarked native, low-water sod options in northern California; or www.ssseeds.com in southern California and the central coast.