

- Keep mower blades sharp. Dull blades wound the grass and make it more vulnerable to pests and diseases.
- If rust disease is present in your lawn, clean your mower between mowings to prevent spreading the disease.

For information on keeping a pesticide-free lawn, visit www.beyondpesticides.org/pesticidefreelawns.

DEAL SENSIBLY WITH WEEDS

- Decide how many weeds you can tolerate. It is not realistic to expect a completely weed-free lawn.
- Dig up weeds by hand and sprinkle grass seed on any bare spots so weeds can't fill in. Water regularly with a fine spray until the grass sprouts.
- Keep grass growing vigorously to crowd out weeds. Don't mow grass too short; taller blades can shade the soil enough to prevent some weed seeds from germinating.
- Use corn gluten meal to prevent certain broadleaf weeds from germinating. Apply in spring or fall a few weeks before annual weeds begin to germinate.
- Using combination weed and feed products is not the most accurate way to control weeds; unnecessary herbicides are likely to be broadcast onto lawn areas where there are no weeds and into adjacent areas where non-target plants will be damaged. Certain trees growing in lawn areas can also be damaged when their shallow roots take up herbicides.

LAWN AERATION

- Aerate spots where you can't push a screwdriver five to six inches into the soil, where water pools, where grass looks thin, or where there is heavy traffic.

- Use a hollow-tined aerator that removes plugs of soil, either a foot-operated or motorized model.
- Irrigate deeply (soil should be moist 5" to 6" down) so you can push the aerator into the soil as far as possible. Allow soil to dry slightly before you begin.
- Leave the plugs on the lawn and break them up with a garden rake.

DETHATCHING LAWNS

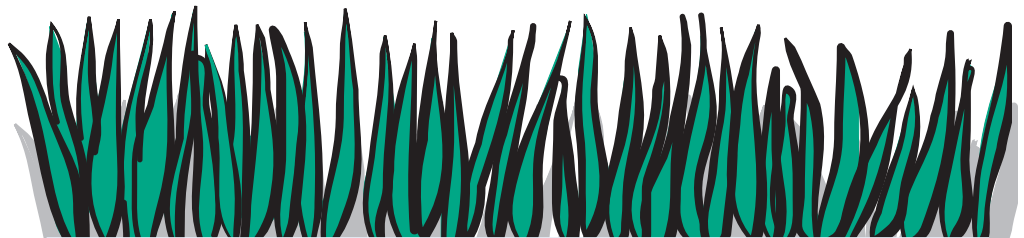
- Thatch is dead and dying, matted grass parts that accumulate on top of the soil. Thatch prevents air, water, and fertilizer from reaching the soil.
- Remove thatch with a rake if more than 1/2" thick.
- Aeration (see above) can help prevent thatch buildup.
- When soil is biologically active, grass clippings decompose and do not contribute to thatch buildup. This is a good reason to eliminate the use of broad-spectrum pesticides that can destroy soil organisms.

FERTILIZING

- Unless the soil texture is sandy, nutrient deficiencies are unlikely and you may not need to fertilize at all. If in doubt, have your soil professionally tested.
- Grass clippings left on the lawn can provide most of the fertilizer.
- If you need to fertilize, use natural fertilizers or slow-release fertilizers, such as sulfur- or polymer-coated urea. These products release nutrients slowly over a longer period, allowing the grass to absorb nutrients more efficiently.
- Fertilizers, if misapplied, can kill soil life and ruin soil structure in even the best soils.

LAWN SUBSTITUTES

Americans spend a great deal of time on their lawns, using an abundance of water, fertilizer, pesticides, and time. If a grass surface is not required, consider replacing all or some of your lawn with an attractive alternative. The following plants require little water and will accept occasional foot traffic:



SOME PREFERRED GRASSES FOR CALIFORNIA

“Cool Season” Grasses (growing season is during cool weather)

Tall fescue (*Festuca arundinacea*)

Dwarf tall fescue (dwarf varieties of *Festuca arundinacea*)

“Warm Season” Grasses (growing season is during warm weather)

Bermudagrass (*Cynodon dactylon*): loses color during cold weather; hybrids need more care

St. Augustinegrass (*Stenotaphrum secundatum*): most shade-tolerant of warm season grasses

Buffalograss (*Buchloe dactyloides*): cannot tolerate shade, dies back in winter



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- 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 1½" 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, 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. Plant strawberry clover as noted above and mow both ground covers to 2" in April, June, and August. In areas with serious drainage problems, chamomile may not grow. In those spots, combine the clover with either of the thymes listed above.

See "For More Information" and "Products and Resources" sections for sources of information on other lawn substitutes.

PLANTING A NEW LAWN

START OUT RIGHT

- Have your soil professionally tested so you know the texture, pH, and salt and nutrient levels.
- Choose a mixture of the right varieties of grass suited to your climate and the conditions in your yard (see Preferred Grasses for California).
- Choose pest- and disease-resistant varieties (ask your nursery).
- Choose sod that has been propagated in soil similar to your own.

WHITE GRUBS

California lawns sometimes suffer from white grubs, the larval (immature) stage of several species of beetles. The genus of beetles most common in California is *Cyclocephala*, the masked chafer. Masked chafer adults do not eat but in their grub stage can cause patches of lawn to die when they feed on grass roots.



Birds, moles, raccoons, opossums, and skunks can add to the damage when they dig in the turf looking for tasty grubs. But just finding wilted patches of grass or animals digging in the lawn does not mean that you have white grubs! You need to find grubs by verifying their presence in several places.

DETECTION

The C-shaped grubs can be up to an inch long and are white with a brown head and three pairs of conspicuous legs.

Damage from grubs can begin to show as early as June or July or as late as August or September and can be mistaken for wilted grass under drought stress. Later, irregular patches die and can be lifted up or rolled back like a carpet. Grub feeding can make the ground feel spongy.

If you have had white grub problems before or suspect you have them this year, begin looking in mid-May by using a cylindrical bulb planting tool to extract a core of lawn so you can examine the roots. Pay particular attention to spots that look unusual.

WHAT CAN YOU DO?

- Pay special attention to drainage and compaction. Healthy lawns can recover more easily from white grub damage.
- Products with imidacloprid may be used to control grubs. This material has a low acute toxicity to mammals. However, imidacloprid can easily wash off and leach into groundwater, and if the insecticide becomes as popular as diazinon was, its use also may lead to water quality impacts. The best approach for grub control is to maintain a healthy lawn without using insecticides.
- Don't treat late in the season 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. Treating now is fruitless. Remove the dead grass, cultivate, and reseed the area.
- Plant warm season grasses, such as bermudagrass, St. Augustinegrass, or buffalograss, or cool season grasses, such as tall or dwarf fescues. These grasses are more tolerant of white grubs.
- Apply beneficial nematodes (*Heterorhabditis bacteriophora*) in late spring before adult beetles emerge, or in mid summer to early fall when larvae are maturing. Nematodes must be applied when the soil temperature is between 60°F and 90°F and the soil is moist. Irrigate the soil before and after application, but don't soak the area. Nematodes need moisture to move around in the soil and to prevent their bodies from dehydrating. Apply nematodes in early evening to minimize damage from UV light. Avoid using fertilizers 2 weeks before and 2 weeks after the application.

Choose a reputable supplier. To make sure nematodes are alive, place a small quantity of the nematode-containing material in water and observe whether they are moving. Look closely because the nematodes are very small. A hand lens or magnifying glass will make it easier to see them. For more information, see the web sites listed on the back page.



Choose less toxic products for your home and garden. Look for this symbol before you buy.



PREPARE THE SOIL BEFORE INSTALLING A NEW LAWN

- Don't work the soil when it is very wet. You can damage its structure.
- Thoroughly mix soil layers of different textures before planting. Poor soil preparation can cause poor drainage, resulting in weak turf.
- Break up all clods into fine particles and remove pebbles and stones.
- Check for low spots by irrigating. Smooth out areas where you see puddles (very important if you are seeding a lawn).

IRRIGATE A NEW LAWN

- Be sure to keep the soil under a new lawn thoroughly moist until the lawn becomes established, but don't drown the plants. Too much water can also wash away seeds.

PRODUCTS AND RESOURCES

Soils Laboratory (see also the Yellow Pages)

A&L Western Agricultural Labs
1311 Woodland Ave., #1
Modesto, CA 95351
209-529-4080
www.al-labs-west.com

Corn Gluten Meal (pre-emergent herbicide)

Supressa
Concern Weed Prevention Plus

Slow Release Fertilizer

Vigoro Lawn Fertilizer and organic fertilizers such as Ringer Lawn Restore, Dr. Earth Lawn Food, EB Stone Nature's Green Lawn Food, Bradfield Organics

Beneficial Nematodes (*Heterorhabditis bacteriophora*):

Rincon Vitova Insectaries, P.O. Box 1555, Ventura, CA 93002; (800) 248-2847; www.rinconvitova.com

Buena BioSystems, P.O. Box 4008, Ventura, CA 93007; (805) 525-2525
www.buenabiosystems.com

For more information on how to apply nematodes see:
www.oardc.ohio-state.edu/nematodes/default.htm
or

www.hort.uconn.edu/ipm/homegrnd/htms/39nemat.htm

Recommended Reading

- *Down to Earth Natural Lawn Care*, by Dick Raymond, published 1993 by Storey Communications, Inc., Pownal, VT.
- *U.C. Guide to Healthy Lawns* online at www.ipm.ucdavis.edu.
- *The Chemical-Free Lawn*, by Warren Schultz, published 1993 by Rodale Press, Emmaus, PA; (610) 967-5171; www.rodalepress.com.

PESTICIDES AND WATER POLLUTION

Common household pesticides show up in treated wastewater and in local waterways, sometimes at levels that can harm sensitive aquatic life. So, water pollution prevention agencies have teamed up with participating retail stores, pesticide distributors, and manufacturers to reduce the risks associated with pesticide use. This fact sheet is part of a series of fact sheets and store displays aimed at educating residents about less-toxic pest management. For the rest of the series of fact sheets, visit www.ourwaterourworld.org. Also, look for the "Our Water Our World" logo next to 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.

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, call 1-800-CLEANUP or visit: www.1800CLEANUP.org. No endorsement of specific brand name products is intended, nor is criticism implied of similar products that are not mentioned.

ACKNOWLEDGMENT

The Central Contra Costa Sanitary District originally developed this IPM outreach program.

FOR MORE INFORMATION

For more information, contact:

Common Ground Organic Garden Supply and Education Center
(650) 493-6072
www.commongroundinpaloalto.org

Bio-Integral Resource Center (BIRC)
(510) 524-2567; www.birc.org

University of California Cooperative Extension Master Gardeners in your area (in the phone book)

University of California IPM website
www.ipm.ucdavis.edu

