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## Diagnosing Lawn Disorders

**T**he most common lawn complaint among homeowners is likely dead or brown patches on turf. This problem seems simple enough, but finding the cause of dead spots can be very challenging. Dozens of different factors can be involved.

Many people tend to blame dead patches on insects or plant pathogens, but in many cases the more likely cause is improper management practices, or *abiotic factors*, rather than living pests.

**1** A first step in diagnosing lawn problems is to review the history of the lawn including recent applications of fertilizer, herbicides, and other pesticides and to examine how water is being applied. Very common causes of damaged grass are fertilizer burn, herbicide damage, and poor watering practices that result in too much or too little water in portions of the lawn. You should consider these potential causes before settling on a pest as the culprit. Improper irrigation probably is the most



E. J. Perry



J. K. Clark



M. A. Harivandi



M. A. Harivandi

*Brown spots in lawns can be caused by many factors, so careful diagnosis is required. Damage includes (clockwise from upper left) dog urine, masked chafer (white grubs), Pythium blight, and fertilizer burn.*

common cause of lawn damage and predisposes turf to invasion by certain plant pathogens or weeds.

**2** Consider the pattern of damage in your diagnosis. Uniform yellow or dead spots that suddenly occur in one area of the lawn, but do not spread in size, most often suggest an abiotic cause—including fertilizer or pesticide damage or dog urine. Symptoms that gradually expand are more typical of a disease or insect problem. Symptoms that show up soon after mowing, fertilizing, or a pesticide application can indicate that these activities could be involved. Dead

patches in shade, in areas of high traffic, or on slopes or uneven areas where mowing regularly scalps the grass could be clues that turf is not the ideal plant in this location and that a redesign of the landscape could be in order.

**3** Know the primary grass species and the time of year the damage began to appear. This information is critical for identifying pest damage in turf. Many pathogens and some insects seriously damage only certain turf species. Weather and season also determine the likelihood that pests will proliferate

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# Diagnosing Lawn Disorders

... continued from the previous page in lawns. For instance, most lawn moth and white grub damage occurs in summer rather than early spring. Wet conditions and warm temperatures favor some diseases such as Pythium blight and Rhizoctonia blight, whereas rust tends to occur in spring and fall when temperatures are cooler but also under wet conditions.



C. A. Reynolds

*Compaction due to high traffic.*

**4** To confirm that damage has been caused by a pathogen or insect, you need to find the pest organism in association with the damaged area of the lawn. If lawn grubs are the problem, you must dig around the roots of injured plants to find them. Lawn moths can be detected by performing a drench test with a solution of water and soap. Generally assistance from a professional laboratory is required to confirm presence of turf pathogens. See the Pest Notes *Lawn Insects* and *Lawn Diseases: Prevention and Management* and the *UC IPM Pest Management Guidelines: Turfgrass* for more information about monitoring and detecting insects and pathogens.

The University of California Web site has an online diagnostic key within the *UC Guide to Healthy Lawns* at <http://www>.



J. K. Clark

*Brown patches of turfgrass killed by Phoenix or Phoenician billbug.*



J. K. Clark

*Fairy ring brown field mushrooms, Agaricus cupreobrunneus, fruiting in two circles in a field.*

[ipm.ucdavis.edu/TOOLS/TURF/PESTS/diagnose.html](http://ipm.ucdavis.edu/TOOLS/TURF/PESTS/diagnose.html) that can help you identify problems in lawns. It includes diagnostic tips, photographs, information about each pest and abiotic order, and management suggestions. A separate key is available for each of the major turfgrass species grown in California. Find all these resources at <http://www.ipm.ucdavis.edu/PMG/menu.turf.html>.

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## Ask the Expert!

**Q** Can you help me advise clients who want to know how often to water their lawn?

**A** To properly time irrigation, you need to know the predominant turf species in the lawn, the sprinkler output in the system, the growing region, and the time of year. The *UC Guide to Healthy Lawns* has an interactive guide that can help schedule irrigation properly. See <http://www.ipm.ucdavis.edu/TOOLS/TURF/MAINTAIN/irrigate.html>.

You can also fine-tune a client's system by using the CIMIS (California Irrigation Management Information System) database. See <http://www.cimis.water.ca.gov/cimis/welcome.jsp> or contact your local UC Cooperative Extension office for more information.

**Q** When is it appropriate to overseed, patch, or renovate a lawn?

**A** Overseeding is a good idea for a lawn that is in good condition but just a little thin. It also is useful to overseed a cool season annual grass (e.g. annual rye) onto a warm season grass lawn that turns brown to green it up during winter. However, research has shown that warm season turf overseeded for winter greening takes longer to start growing in the spring. Patching—usually with sod but seed also can be used—is

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# Water Conserving Demonstration Gardens Hold Open House

... continued from the previous page used to fix one or a few isolated spots of dead or dying grass in an otherwise healthy lawn. A complete renovation, which involves removing the existing lawn and replanting, is recommended when 40% or more of the turf in the lawn is dead or dying.

**Q How can I find out more about the turf species in my client's lawn or find out about other turf species that might be a better fit for a particular situation?**

**A** The *UC Guide to Healthy Lawns* includes a key to turf species plus tables of turf species best adapted for various conditions; it is available at <http://www.ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/index.html>. You also can download UC ANR publication No. 8035, *Turfgrass Selection for the Home Landscape*, at <http://anrcatalog.ucdavis.edu/pdf/8035.pdf>.

**Q As a QAL, where do I get information about what pesticides to use on turf?**

**A** The *UC IPM Pest Management Guidelines: Turfgrass* includes up-to-date information on insect, plant pathogen, and weed pests in turf and suggested management practices including pesticides available for use by licensed or certified landscape pesticide applicators. Find the guidelines at <http://www.ipm.ucdavis.edu/PMG/menu.turf.html>.

*Have a question? E-mail it to [ucipm@ucdavis.edu](mailto:ucipm@ucdavis.edu).*

Visitors learned how to reduce the amount of water they use in landscapes and how to keep it from running off-site when they attended a recent demonstration garden open house. More than 300 home gardeners, professional landscapers, and others attended the Oct. 2 event at the UC South Coast Research and Extension Center in Irvine, Calif.

Throughout the day vendors were available to answer questions about retrofitting sprinkler nozzles or how to use new controllers to automatically or manually adjust watering times based on soil moisture or rainfall. Low water-use plants, including buffalo grass and UC's Arboretum All-Stars, were on display from suppliers. UC Master Gardeners were on hand to answer questions about pests and gardening, and fruit tasting sponsored by the California Rare Fruit Growers was a popular attraction. Even a blacksmith was on hand to sharpen gardening tools.

Master Gardeners led tours of the demonstration gardens, showing the differences that design and plant selection can make in water use. Participants saw the wide range of plant types and how these low water-use plants look in a home landscape setting. Inside the demonstration



C. A. Wilen

*A vendor discusses how to use a water-saving device.*

houses, visitors were treated to short presentations about the Arboretum All-Stars, weed control, water conservation, and irrigation.

The Arboretum All-Stars are 100 tough, reliable plants that are easy to grow, don't need a lot of water, have few problems with pests and diseases, and have outstanding qualities in California gardens. Learn more about these plants at [http://arboretum.ucdavis.edu/arboretum\\_all\\_stars.aspx](http://arboretum.ucdavis.edu/arboretum_all_stars.aspx).

To schedule a tour of the demonstration gardens, contact Tammy Majcherek at [tjmajcherek@ucdavis.edu](mailto:tjmajcherek@ucdavis.edu) or (949) 733-3970.

—Cheryl Wilen,  
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C. A. Wilen

*Open-house vendor booths.*



C. A. Wilen

*Demonstration gardens.*

# Q&A: Water Conservation and Drought in the Landscape

Poor irrigation practices that result in too much or too little water can lead to problems in lawns or landscape plants. In addition, managers of landscapes in many urban areas are facing mandatory or voluntary water conservation targets. Below are some answers to help you irrigate for good plant health without wasting water.

**Q** Are there some easy things I can do to save water in a landscape?

**A** Check sprinkler irrigation systems regularly for physical and operational problems that reduce a sprinkler system's efficiency. Correcting these problems can improve the uniformity of water application, reduce water waste by 10% or more, and greatly improve the health of plantings. Walk through an area while the irrigation system is running and repair or replace sprinklers that are broken, sunken, crooked, or clogged with soil or debris. Also, be certain that plants are not blocking or interfering with a sprinkler's spray pattern and that all emitters are from the same manufacturer and are the same model.

**Q** Does a landscape have to be replanted with specific drought tolerant or "California friendly" plants to save significant amounts of water?

**A** No. Field research studies indicate that most established landscape trees, shrubs, and ground covers, regardless of the species planted, perform acceptably with 20 to 40% less irrigation than they typically are given. These include many of the plant species commonly grown in existing landscapes.

**Q** What plants actually are drought resistant?

**A** Most commonly planted tree and shrub species along with many ornamental ground covers and vines have at least some degree of drought resistance. These types of plants usually perform acceptably in a landscape with much less water than they are typically given once they are established. Some California native plants used for landscaping originate in the relatively cool, moist climate of the coast or in the Sierra Nevada foothills, making them susceptible

to drought and prone to injury when grown in warmer and drier areas of the state if some summer irrigation is not provided.

No native or commonly used landscape plant is drought resistant until it becomes established. All plants require a steady supply of moisture for about one year or more after they first are planted. Once woody landscape plants are established and have a deep root system, they typically perform acceptably with limited summer water.

**Q** How much water can be saved by removing all or part of a lawn?

**A** Water savings depends on the type of turfgrass planted, which plants—if any—will replace it, and how well the water applied to new plants is managed. If plant material is changed but irrigation practices are not, then little water savings will be realized. Turfgrass water requirements vary by species. Warm-season lawns, such as bermudagrass, zoysiagrass, and St. Augustinegrass, need about 20% less water than widely planted cool-season lawns, such as tall fescue. So simply replacing a tall fescue lawn with a warm-season one will significantly reduce the water needs of a turf area. Warm-season grasses can remain alive and largely green, though not lush, when irrigated at the same level as trees and shrubs.

**Q** Will lawns or landscapes suffer if they are not irrigated every day in the summer?

**A** Established lawns and landscapes do not require daily summer irrigation except in a few extremely hot inland and desert areas that also have sandy or decomposed granite soils. Only newly planted lawns and landscape plants are likely to be damaged by not receiving daily summer irrigation.

Tall fescue lawns can perform well when irrigated 2 to 4 times per week in the summer, while bermudagrass and other warm-season lawns usually can be irrigated less frequently. Trees, shrubs, and ground covers will perform well when irrigated every 5 to 10 days. Follow the approach described in the answer to the next question to reduce irrigation days and conserve water.

**Q** What is the best approach for conserving water in a lawn or landscape?

**A** The key to conserving irrigation water is to increase runtimes and extend the number of days between irrigation events rather than reduce the runtime and keeping the same frequent irrigation interval. To do this successfully, schedule slightly longer irrigation runtimes so that the entire root zones of plants are rewetted at each irrigation and gradually increase the interval between irrigations over a few to several weeks. This practice will save water in the end and allow plants to adjust. After extending the interval between irrigations, the water budgeting or seasonal adjust feature found on many controllers can be used to fine-tune runtimes and achieve optimum water conservation.

Remember that tall fescue lawns normally have roots 6 to 12 inches deep while roots of bermudagrass and other warm-season grasses normally are at least 12 inches deep. The majority of roots of trees, shrubs, and ground covers normally are found within 12 to 24 inches of the soil surface.

In order to fully wet the soil to these depths without creating run off or puddling of water usually will require scheduling 2 to 4 relatively short irrigation cycles of 5 to 15 minutes or so on each irrigation day, depending on slope, soil type, output of the irrigation system, and how much water is needed. Be certain the irrigation system is functioning well and water is applied uniformly over the area.

**Q** How much can irrigation be reduced without hurting a lawn?

**A** It depends on the species of grass that dominates the lawn and the amount of water currently being applied. If the lawn is primarily tall fescue or another cool-season grass and it is being well watered with no obvious drought symptoms or brown areas, then the amount of water probably can be reduced by 10 to 15% without seriously injuring it. You might see brown areas develop over time after reducing water by this amount, however. Brown areas that develop in lawns when water is reduced are often a sign that the irrigation system applies water unevenly rather than that the amount of water is too little to meet the turfgrass' needs.

If the lawn is predominantly bermudagrass or another warm-season grass and you are keeping it well watered, you probably can reduce the amount of water

by up to 25% without seriously hurting it. If the lawn already has brown areas from too little water, then reducing the amount of water further might cause serious damage or death. Always gradually reduce the amount of water applied following the approach described above.

**Q** How much can irrigation be reduced without hurting trees, shrubs, and other landscape plants?

**A** The amount of water given to these plants often can be reduced by 20 to 40%, because over irrigation is common. Gradual reductions applied over a few to several weeks using the approach described above is important so plants can adjust to less water, especially if the reduction is more than 10%.

**Q** When is the best time of day to irrigate?

**A** Irrigating during the very early morning hours is best, generally between 2 and 6 a.m. Evaporation is lower, and usually there is little or no wind to disrupt the pattern of sprinklers during these hours. In addition, water pressure is more favorable for irrigation systems in many areas during this period. Nighttime watering in California normally does not cause greater incidence of plant disease, because the humidity is relatively low. Contrary to common belief, midday irrigation does not harm plants.

**Q** If water becomes severely restricted, how should priorities be set to save landscape plants?

**A** Remove plants in crowded beds or low-priority plants competing for soil moisture with more important plants. When water is limited, most people choose to water fruit trees, landscape trees, and shrubs. Lawns, ground covers, and bedding plants can be reestablished over a relatively short time, but trees and shrubs need years to mature and are less easily replaced. A few deep, thorough waterings spaced several weeks apart from spring through summer can be enough to keep most trees and shrubs alive when water is in short supply. Many tree and shrub species will drop leaves or wilt under severe water shortage but will survive. Under-watered fruit trees probably will produce less if any fruit but also will survive.

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# Water Conservation and Drought

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**Q** How long will it take a lawn to die from lack of water?

**A** If you stop watering a lawn, it gradually will turn brown, signifying it has died or become dormant. Depending on weather conditions, this could take 1 to 6 weeks for most lawn grasses, but it might take longer for deep-rooted grasses such as bermudagrass. The first signs of inadequate water will be wilting of grass blades and a bluish-gray appearance. Next, leaf blades will yellow and eventually become brown. The lawn probably will not turn from a uniform green to a uniform brown but will instead look mottled with green, yellow-green, gray, and brown areas. A lawn that recently turned brown from drought often can be revived with regular, thorough watering.

**Q** When should trees, shrubs, and other landscape plants be planted in a dry year or if drought is expected?

**A** Hold off planting until fall or winter to take advantage of cool weather as well as fall and winter rains. The planting site can be prepared in spring or summer, however.

**Q** How often should newly planted trees and shrubs be watered?

**A** The root balls of newly planted trees and shrubs need to be kept moist until a network of roots grows out into native soil. Newly planted container plants might need watering every day for several weeks during warm weather. Adding a 2- to 4-inch thick layer of mulch reduces water loss and weed problems.

Delaying planting until the fall can reduce the frequency of irrigation required to maintain moisture in the root balls of new transplants and takes advantage of fall rains.

**Q** If a lawn dies, or is damaged due to drought, when should it be replanted?

**A** Do not replant a lawn until there is enough water available from rainfall, irrigation, or a combination of the two. Assuming water is available, the best time of year to plant lawns is in the fall or spring for cool-season turfgrasses (tall fescue, rye, etc.) and late spring or summer for warm-season turfgrasses (bermuda, zoysiagrass, and St. Augustine).

**Q** Will adding polymers or similar “water conserving” products to soil really conserve water?

**A** Polymers and similar products by themselves do not conserve water. They usually increase the amount of water a soil can hold, but plants still need the same amount of water. Thus, adding a polymer to a soil can extend the length of time required between irrigations but will not significantly alter the amount of water used by plants. Field research studies with polymers so far are relatively few and inconclusive. Results suggest that, although most polymers can extend the time between waterings, some lose effectiveness when fertilizers and other natural salts are present in the soil. They will provide little benefit in soils with high clay or high organic matter content. When using a polymer product, add enough polymers to effectively amend the soil to the depth where most of the plants’ roots are and mix it evenly into the soil. A large volume of polymer will be required to increase significantly the soil’s water-holding ability especially where relatively deep-rooted plants like trees and shrubs are grown.

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