

# BERMUDAGRASS

*Integrated Pest Management for Home Gardeners and Landscape Professionals*

Bermudagrass (*Cynodon dactylon*) is a plant that is grown as a turfgrass or as forage for livestock, but it also can be an invasive weed. It was introduced from Africa (not Bermuda) in 1751 and is widely spread throughout the southwest and southern United States. It is found in most areas of California at elevations below 3,000 feet and is common in gardens, landscapes, turf areas, orchards, roadsides, vineyards, and industrial areas. Bermudagrass also has many other common names including couchgrass, devilgrass, wiregrass, or dogtooth grass.

Improved hybrids of bermudagrass (Tifgreen, Tifdwarf, Tifway, Santa Ana) with fine leaves and a longer season of dark green color have been developed specifically for use as turfgrass. These hybrid varieties do not produce seed, whereas common bermudagrass produces seeds that remain viable in soil for at least 2 years.

## IDENTIFICATION AND LIFE CYCLE

Bermudagrass is a low-growing, wiry perennial that has two types of shoots: those aboveground (stolons) and those belowground (rhizomes). The stolons and rhizomes are capable of rooting in the soil, thus creating new plants as they grow out from the original plant or when they are cut and left on moist soil. In areas where the soil has not been disturbed, rhizomes are shallow (1 to 6 inches). But where the soil has been spaded or tilled deeper than 6 inches, or in sandy soil, under sidewalks, and against solid structures such as building foundations or walls, the rhizomes may be deeper than 6 inches. Leaves are generally smooth and pointed with a conspicuous ring of white hairs at the junction of the blade and sheath. The prostrate stems typically have a papery leaf sheath at each node. The

stems root at the nodes in moist soil. Flowering stems are upright and bear a terminal group of three to seven spike-like branches, usually originating in a single whorl on the tips of the stem. The flowering stem is similar to that of crabgrass (*Digitaria* spp.), but the spike-like branches on crabgrass usually originate about  $\frac{1}{8}$  to  $\frac{1}{4}$  inch apart at the end of the stem, though sometimes they are closer. Individual spikes on the flowering stems of bermudagrass originate at the same point, are 1 to 2 inches long, and bear two rows of spikelets along one side of a flattened rachis (the central stem of the spike).

Bentgrass (*Agrostis* spp.), which also occurs as a patch or large mat in a lawn, may be confused with bermudagrass. Creeping bentgrass (*A. stolonifera*), the species most common in turf, has very fine leaves, stems, and stolons and no rhizomes. When mowing is frequent, bentgrass does not produce a seed head. In areas that are infrequently mowed, it has a bushy panicle (flower cluster) that is about  $1\frac{1}{2}$  to 3 inches long.

## MANAGEMENT

Bermudagrass is not an easy weed to control, especially when it must be controlled selectively within an already planted turf, garden, or landscaped area. It can be managed nonchemically



Figure 1. Bermudagrass.

with a persistent program of removal, or over large areas by cultivation and by withholding water during the summer to desiccate the stolons and rhizomes. Mulches of black plastic or geotextile landscape fabric can also be effective over large areas if light is excluded. Control with herbicides requires careful timing and often more than one application.

## Cultural Control

Although bermudagrass tolerates some drought, it grows best when irrigated. If the area where the bermudagrass is growing can be dried in summer without injuring any nearby ornamentals, withhold water to dry the stems

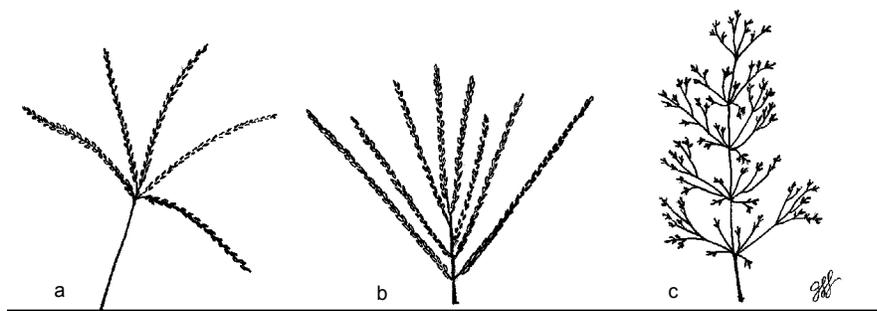


Figure 2. Flowering stems of (a) bermudagrass, (b) crabgrass, and (c) bentgrass.

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University of California  
Agriculture and Natural Resources

Publication 7453

Revised May 2007

and rototill or spade the area two or three times during summer months. This will bring rhizomes to the surface where they dry out. Raking to remove rhizomes and stolons will also help. If water is applied during the process or it happens to rain, the remaining bermudagrass will regrow. A single, deep (down to 6 inches) cultivation may be adequate to bring the majority of shoots to the surface, but the time required to dry the remaining rhizomes still buried in the soil will add additional weeks to months. Be careful not to cultivate bermudagrass if the soil is moist or the weed will spread, because cultivation chops the stems into segments and each segment becomes a new plant. While cultivating and drying can effectively kill established plants and rhizomes, they do not kill seeds in the soil.

Bermudagrass growth can be reduced by increasing shade from trees and tall shrubs. Shaded growth will be fine and spindly; plants are easier to remove than those growing in full sun. Shade from short shrubs or ground covers will not be effective; the bermudagrass will simply grow up through these plants. Because bermudagrass spreads vegetatively and by seed, it can be spread by clippings from mowing. If lawn clippings are to be used in the landscape, compost them thoroughly to kill seed and vegetative structures and reduce the spread of this weed.

### ***Mulching and Solarization***

Mulch can be used in a variety of ways to manage bermudagrass. Black polyethylene applied over bermudagrass to prevent sunlight from reaching the plant can effectively control established plants. Mow and irrigate the grass, place the plastic over the plants, and leave it for at least 6 to 8 weeks in summer. Placing plastic over bermudagrass in winter will not control it. Be sure that the plastic remains intact without holes, or bermudagrass will grow through the holes and survive. If ornamentals are planted in holes in the plastic, bermudagrass control is reduced.

Clear plastic mulching (solarization) is effective for eradication of

bermudagrass plants and seed if it is applied during periods of high solar radiation. In California's Central Valley, this means during June to August, whereas in coastal areas the best time may be August to September or May to June when fog or wind is most likely to be at a minimum. Before applying the plastic, closely mow the bermudagrass, remove the clippings, and water the area well. It is not necessary to cultivate before solarization, but a shallow cultivation may improve control. Place clear, ultraviolet (UV) protected polyethylene over the area. The plastic should extend roughly 2 feet beyond the bermudagrass stolons to make sure the infested area is covered; it must be maintained intact for 4 to 6 weeks. Shade will reduce the effectiveness of solarization because it limits the amount of radiation. Solarization works most effectively when there is no slope in the land or if there is, the slope has a south or southwest exposure. Temperatures are not as high under plastic placed on a north-facing slope; consequently control is not as effective. After solarization, do not cultivate the area deeper than 3 inches to avoid bringing weed seed into the upper soil layer. (See the soil solarization publication listed in References).

Mulching with products such as wood chips is not effective against bermudagrass because the weed can push up this mulch. If organic landscape (geotextile) fabrics are used under the mulch, however, control can be achieved. The fabric must be overlapped so the stolons do not grow between the fabric sheets. If holes or gaps are present in the fabric, control will be reduced because bermudagrass is likely to grow through the holes. .

### ***Chemical Control of Established Plants***

Bermudagrass can be controlled in ornamental landscapes and turf with postemergent herbicides. Postemergent herbicides are applied to actively growing bermudagrass foliage and stems during spring and summer. The best time to apply a particular postemergent herbicide depends on the type of herbicide and the situation where the weedy

bermudagrass is growing. There are two basic types of herbicides that can kill mature bermudagrass, nonselective herbicides that kill most plant species and grass-selective herbicides that only kill plants in the grass family (Poaceae). In addition, there are some herbicides that will suppress bermudagrass, which might give a desirable turf species a chance to outcompete the weed.

**Grass-Selective Herbicides.** These herbicides include the active ingredient sethoxydim (Grass Getter), fluazifop (Fusilade, Ornamec, and Grass-B-Gon), or clethodim (Envoy). Fusilade and Envoy are only available for sale to licensed pesticide applicators, the others are sold in most retail garden outlets. This is not a complete list of all retail products; look for similar herbicides with the same active ingredient.

Early spring is the best time to apply a grass-selective herbicide. For best control with these herbicides, make the first application in spring when new bermudagrass growth is less than 6 inches in length, then re-apply the herbicide before the regrowth reaches 6 inches again. Additional applications on regrowth may be needed through the spring and summer. It is important to be consistent with treating regrowth in order to eliminate the weed, but read the label of each product for information on the total amount that can be used per year per area. The best control is achieved when the bermudagrass is growing vigorously, has lots of leaf surface and is not drought stressed, is not dusty, and has not been damaged by insects.

### ***Treating Around Ornamentals and in Turf.***

These herbicides can be used safely around most, but not all, ornamental trees, shrubs, and flowers. The product use labels include lists of ornamental plants that can be injured by these herbicides. Do not use these herbicides near ornamental grasses. The herbicide Fusilade can be used to kill bermudagrass in fescue turf when label conditions are followed.

**Nonselective Herbicides.** Glyphosate (Roundup and other brand names) is a nonselective herbicide that kills plants by translocating down into the root system, in addition to killing top-growth. For glyphosate to be most effective it must be applied to bermudagrass that is vigorously growing, not drought stressed, and has lots of leaf surface (do not mow the weed for 2 to 3 weeks before treating). The best time of the year to apply glyphosate is during late summer when the plant is storing food in the roots. Wait 7 days after applying to mow or cultivate the bermudagrass. Cultivation will bring the underground parts of the plant (stolons and rhizomes) to the surface of the soil so they can dry. If left uncultivated, deeper rhizomes and roots may survive the first application and regrow.

**Other Herbicides.** Some herbicides will suppress bermudagrass by killing green stems and leaves. Suppressing bermudagrass will not typically eliminate it permanently from an area, because there is no effect on the rhizome system, but it might be enough to foster the growth of a desirable turf species. Rigorous, repeated suppression may eliminate the weed if combined with control of bermudagrass seedlings.

Herbicides that can suppress bermudagrass include nonselective contact herbicides such as diquat (sold mostly in formulation with other her-

bicides), pelargonic acid (Scythe), other fatty or weak acids, and glufosinate (Finale). These herbicides can be used in ornamental and turf situations, but they will also injure desirable vegetation that they contact. Triclopyr (Weed-B-Gon and Turflon) is a selective herbicide that kills broadleaf plants, but will suppress bermudagrass in cool season turfgrasses.

### ***Controlling Bermudagrass Seed***

Following the treatment of a stand of established bermudagrass, bermudagrass seed that is present in the soil can still be a problem. Bermudagrass seed will not be controlled with any of the previously mentioned treatments except solarization.

**Treating Around Ornamentals.** If bermudagrass seeds germinate in areas around ornamental plantings, the seedlings can be controlled with shallow cultivation, hoeing, or a thin layer of mulch.

**Treating Turfgrass.** Bermudagrass seedlings may emerge in turfgrass that has been treated with postemergent herbicides because postemergent herbicides do not control the seed. On recently planted or established cool-season turfgrass, herbicides can be used to selectively control germinating bermudagrass seed without injuring the turfgrass. Apply a product containing siduron at the time of planting the

turfgrass; DCPA (available to licensed pesticide applicators only), trifluralin (Treflan), pendimethalin (Halts, Pendulum), or oryzalin (Surflan) can be used when the turfgrass is greening. Dithiopyr (Dimension) and proflaminate (Barricade, which is available to licensed pesticide applicators only) can be used in established turf. To effectively control new seedlings, apply these herbicides before the seeds germinate. Because bermudagrass seed is viable in the soil for 2 years, apply the herbicide each year for 2 years.

Do not use preemergent herbicides, except those containing siduron, just before seeding or sodding a new lawn because they also affect germination of the desired grass species.

### **REFERENCES**

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**ILLUSTRATIONS:** **Fig. 1:** adapted from *Selected Weeds of the United States*. 1970. ARS/USDA Agri. Hdbk #366. US Gov. Printing Off. **Fig. 2:** J. L. Lockwood

Produced by UC Statewide IPM Program, University of California, Davis, CA 95616

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This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by the ANR Associate Editor for Pest Management.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

**WARNING ON THE USE OF CHEMICALS**

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate lakes, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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