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# BERMUDAGRASS

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*Integrated Pest Management for Home Gardeners and Landscape Professionals*

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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 seed that remain viable in soil for at least 2 years.

## IDENTIFICATION AND LIFE CYCLE

Bermudagrass is a low-growing, wiry perennial (Fig. 1) that has two types of shoots: those aboveground (stolons) and those below ground (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 spikelike branches, usually originating in a single whorl on the tips of the stem (Fig. 2a). The flowering stem is similar to that of crabgrass (*Digitaria* spp.), but the spikelike branches on crabgrass usually originate about  $\frac{1}{8}$  to  $\frac{1}{4}$  inch apart at the end of the stem (Fig. 2b), 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 is without rhizomes. When mow-



Figure 1. Bermudagrass.

ing is frequent, bentgrass does not produce a seed head. In areas that are infrequently mowed, it has a bushy panicle that is about  $1\frac{1}{2}$  to 3 inches long (Fig. 2c).

## MANAGEMENT

Bermudagrass is not an easy weed to control, especially when it must be controlled selectively within an already

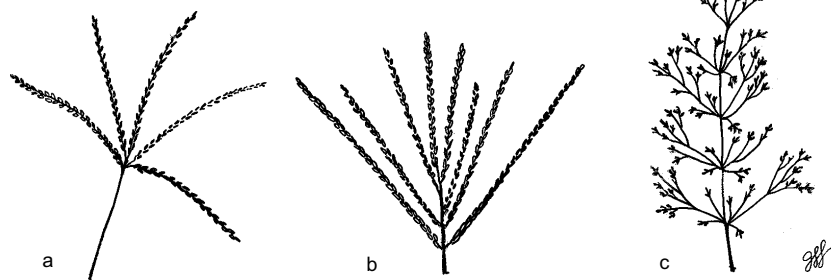


Figure 2. Flowering stems of (a) bermudagrass, (b) crabgrass, and (c) bentgrass.

planted turf, garden, or landscaped area. It can be managed nonchemically with a persistent program of removal, or over large areas with cultivation and 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 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 bermudagrass will regrow. A single, deep (down to 6 inches) cultivation may be adequate, but the time required to dry the remaining rhizomes still buried in the soil will be increased from 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 clip-

pings 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. Examples of landscape fabrics include DeWitt's Pro 5, Weed Block, and Typar Landscape Fabric.

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

Established stands of bermudagrass can be controlled in the landscape with postemergent herbicides. Postemergent herbicides are applied to bermudagrass leaves and stems when they are growing vigorously (from spring to late summer). The best time and way to apply the herbicide depends on whether it is selective or nonselective. Selective herbicides only kill the specific plants that they are targeted for whereas nonselective herbicides kill most plants they contact. Because nonselective herbicides that control bermudagrass also kill or injure other grasses in the turfgrass, do not apply them to a mixed stand of turfgrass unless you intend to kill other grass species as well.

**Selective Herbicides.** Early spring is the best time to apply a selective herbicide. For best control with these herbicides, make an application in spring when new bermudagrass growth is less than 6 inches in length, then reapply the herbicide before the regrowth reaches 6 inches in length. Additional applications may be needed as new growth occurs. There may be limits to how much herbicide can be applied in a year so it is important to follow the label. Control is increased if the plant

is growing well with plenty of leaf area. Plants that are drought stressed, insect damaged, or with dust on the leaves will not be controlled.

*Treating Around Ornamentals.* Three herbicides that are safe to use near many ornamental plants (see labels for exact species) are sethoxydim (Grass Getter) and fluazifop (Grass-B-Gon, Ornamec), which are available for use by both the home gardener and licensed pesticide applicator, and clethodim (Envoy), which is available for use by licensed pesticide applicators only.

*Treating Turfgrass.* In cool-season turfgrasses (annual and perennial ryegrasses, bentgrasses, fine and tall fescues, and Kentucky bluegrass), tri-clopyr (Weed-B-Gon, Turflon) can be used to suppress bermudagrass. For fescue turfgrasses only, fluazifop (Fusilade) is available to control bermudagrass. Be sure to follow label directions carefully to avoid injury to the turfgrass.

**Nonselective Herbicides.** Nonselective herbicides are generally applied in late spring or during summer when bermudagrass is growing rapidly. Nonselective herbicides will injure most plants that they contact, so care must be taken that they are not sprayed on desirable plants. Two nonselective herbicides, pelargonic acid (Quik Weed Killer, Scythe) and glufosinate (Finale), are contact herbicides, which means they kill only green parts of the plant that they contact. When the bermudagrass begins to regrow from the underground rhizomes, repeat applications will be necessary. (Both materials are available to use around ornamentals in

the home landscape.) In addition, there is a product (Grass and Weed Killer), which combines a selective grass herbicide (fluazifop) with a nonselective contact herbicide (diquat), that is sold for use around ornamentals.

Glyphosate (Roundup and other formulations) is a nonselective herbicide that is translocated throughout the plant so it kills both the tops of the plant and the roots. For it to be most effective, it must be applied to vigorously growing bermudagrass that is not water stressed. Do not mow the bermudagrass for 2 to 3 weeks before applying it and withhold water for 2 to 3 days after an application. For even more effective control, spray the area with glyphosate, leave it for up to 7 days, then cultivate the area to cut surface stolons and bring rhizomes to the surface to dry out. If it isn't cultivated, another application of glyphosate may be necessary when the weed begins to grow again.

### **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 seed 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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For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

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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.

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#### 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.

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 nor 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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