

CRABGRASS

Integrated Pest Management for Home Gardeners and Landscape Professionals

Crabgrass is a weed almost everyone is familiar with. Two species are common in California—smooth crabgrass, *Digitaria ischaemum*, (Fig. 1) and large or hairy crabgrass, *D. sanguinalis*, (Fig. 2). Both were introduced from Eurasia and are widespread throughout the United States. As annuals, they germinate, set seed, and die within one year.

You'll find crabgrass in lawns, ornamental landscapes, and vegetable gardens. Large crabgrass also grows in orchards, vineyards, and other agricultural areas. Crabgrass has many other names including crowfoot grass, watergrass, and summer grass. It grows in most parts of California, except at high elevations and areas that receive no summer water. It is often confused with goosegrass and the perennials dallisgrass and bermudagrass.

IDENTIFICATION AND LIFE CYCLE

Smooth Crabgrass

Smooth crabgrass is a low-growing, summer annual that spreads by seed and from rootings of the joints (culm nodes) that lie on the soil. It dies with the first frost in the fall. Unmowed, it will grow upright to about 6 inches, but even if you mow it as short as $\frac{1}{4}$ inch, it still can produce seed.

Seedling leaves are light green and smooth (Fig. 3). They are very conspicuous in the lawn with their lighter green color. True leaves are dark green but still smooth, and the leaf blade is from $\frac{1}{4}$ to $\frac{1}{3}$ inch across, up to 5 inches long, and pointed. Crabgrass often forms patches in lawns, and plants can grow together to form large clumps. The projection at the base of the leaf blade, known as the ligule (Fig. 4), is small



Figure 1. Smooth crabgrass.



Figure 2. Large crabgrass in a lawn.

and inconspicuous, and the collar region lacks the clasping, prominent outgrowths or auricles present on some grasses. The leaf sheath and upper leaf surface are smooth, but a few hairs can be present on the lower leaf surface. Sometimes a reddish tint is visible at the base of the leaf.

The inflorescence, or flower stalk, (Fig. 5) has branches that originate from the main stem at $\frac{1}{8}$ - to $\frac{1}{4}$ -inch intervals. The branches are $\frac{1}{2}$ to $2\frac{1}{2}$ inches long at the end of the stalk.

Large Crabgrass

When found in turf, large crabgrass is a low-growing, summer annual that spreads by seed and from rootings of nodes that lie on the soil. Unmowed, it can grow 2 feet tall. It won't tolerate close mowing as well as smooth crabgrass. As a result, smooth crabgrass is a more common weed in lawns.

Seedling leaves are light green and hairy. True leaves are generally 3 inches long and hairy on the upper surface of the leaf and leaf sheath. The collar region and flower stalk are similar to that of smooth crabgrass, but the branches are longer—about 2 to 5 inches—at the end of the stalk. One source reports seed production from a single, large crabgrass plant can be as high as 150,000.



Figure 3. Smooth crabgrass seedling.



Figure 4. Smooth crabgrass collar region and sheath. The ligule at the base of the leaf blade is a short projection, and there are no auricles.



Figure 5. Flowering stem of smooth crabgrass.

PEST NOTES

Publication 7456

University of California
Statewide Integrated Pest Management Program
Agriculture and Natural Resources

June 2010

Lifecycle

The flowering stems of both species of crabgrass are similar to those of bermudagrass and goosegrass, but the panicle-like branches (whorls) on the flowering stems of these other grasses originate at the same point while those on crabgrass originate about 1/8 to 1/4 inch apart at the end of the stem.

Dallisgrass, another common grass in lawns, has panicle branches that are widely separated on the flowering stem (Fig. 6). Dallisgrass and bermudagrass can be readily distinguished from crabgrass by their characteristic vegetative reproductive structures that allow rapid spread in the garden. Dallisgrass has short, thick, underground rhizomes, and bermudagrass spreads with slender, belowground rhizomes and aboveground rooting stems called stolons. As an annual weed, crabgrass spreads primarily by seed and doesn't have rhizomes or stolons.

In Southern California, the major germination period for both crabgrass species is from mid-January to early April, depending on the temperature; however, seeds can germinate throughout spring and summer. Although germination is early in areas with mild winters, growth is slow during spring months until mid-May. In June and July the plants produce primarily leaves and stems and typically flower in late July and August. In the absence of a frost, crabgrass can overwinter in warm areas or during warm winters and produce new growth and a second crop of seed in spring or early summer.

In central and northern parts of the state, crabgrass begins to sprout early to mid-March when soil temperatures reach 50° to 55°F for at least 3 consecutive days. Growth and germination will continue throughout summer and into fall.

MANAGEMENT

Crabgrass is easy to manage using a variety of cultural and chemical controls. Controlling crabgrass before it sets seed is important, because the seeds can remain viable for at least 3 years in soil.

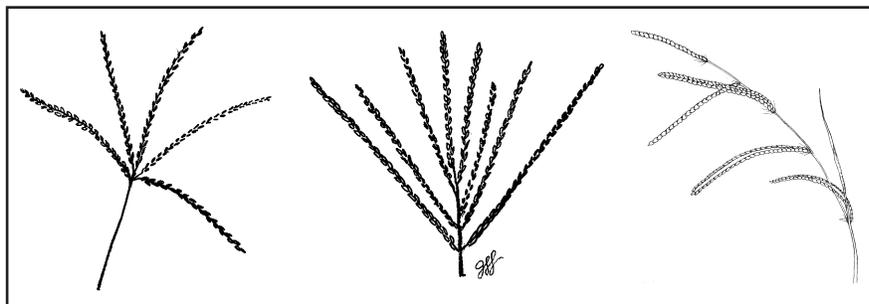


Figure 6. Flowering stems of bermudagrass (left), crabgrass (center), and dallisgrass (right).

Cultural Control in Turfgrass

Because crabgrass spreads and reproduces primarily by seed, any cultural efforts that reduce seed production will decrease occurrences of this weed. Cultural activities that increase the vigor of turfgrass also decrease the potential of crabgrass invasion. These include using the proper mowing height for your specific turf, selecting the best turf species for your area, overseeding to keep turfgrass thick, applying fertilizer at the correct time of year, and proper irrigation. For more information on maintaining vigorous lawns that out compete weeds, see The UC Guide to Healthy Lawns at www.ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/.

Mowing at the optimum height for turf increases turfgrass vigor and reduces the germination and establishment of crabgrass. Select the proper mowing height from Table 1 for the dominant turfgrass species in your lawn. After mowing crabgrass-infested turf, thoroughly rinse the mower to remove seeds and avoid transferring them to uninfested sites.

Selecting a turfgrass that is adapted to your local conditions also will help produce vigorous turf. Cool-season species (bentgrass, Kentucky bluegrass, tall fescues, and perennial ryegrass) are most competitive in coastal and northern regions of California. Some of the newer cultivars of Kentucky bluegrass, tall fescue, and perennial ryegrass are even more competitive and grow better than the older cultivars. For example, tall fescue cultivars used

Table 1.

Proper Mowing Height for Turfgrass Species.

Turf species	Mowing height (in inches)
bentgrass, colonial	0.5–1
bentgrass, creeping	0.5 or less
bermudagrass, common	1–1.5
bermudagrass, hybrid	
Santa Ana	0.5–0.75
tifgreen	0.25–0.5
tifway II	0.5–0.75
bluegrass, Kentucky	1.5–2.5
dichondra	0.5–0.75
fescue, fine	1.5–2.5
fescue, tall	2–3
kikuyugrass	1–1.5
ryegrass, annual	1.5–2
ryegrass, perennial	1.5–2.5
St. Augustinegrass	1–2
zoysiagrass	.5–1

for turf vary in their ability to compete with both smooth and large crabgrass. Crabgrass tends to invade the older fescue varieties (Fawn and Kentucky 31), which grow in an open, upright manner. The slower-growing, dwarf-type tall fescue varieties, especially Bonsai, also are susceptible to crabgrass invasion. A newer Bonsai variety (2000) claims a more vigorous growth habit.

Warm-season species (bermudagrass, dichondra, St. Augustine grass, and zoysiagrass) are most competitive with weeds in interior valleys and desert regions. Kikuyugrass is more competitive in south coastal regions.

In the turf selection process it is important to consider the amount of foot traffic, pest problems, and/or shade, as these factors can significantly impact the vigor of the lawn. For example, hybrid bermuda can be very competitive, but only if it receives adequate sunlight. If it receives fewer than 6 hours of sun during the day, it will grow poorly and weeds can easily invade. Tar Heel tall fescue withstands more foot traffic on the lawn than does the variety Justice. Other newer tall fescue varieties include Barlexas, Coyote, Greenkeeper, and Innovator.

Fertilizers can increase turfgrass vigor and reduce the possibility of a crabgrass invasion. The best time to fertilize is when the turf is actively growing, which depends upon your turf species (Table 2). Because seedling crabgrass isn't very competitive, a vigorously growing turf will crowd out new seedlings.

Irrigation timing and amount also can affect crabgrass germination and growth. Overwatered turf or turf that receives daily, light irrigation becomes weak and vulnerable to invasion by this weed. Irrigating once a week will improve turf vigor. Often, crabgrass first appears in open areas with no turf, along sidewalks where the soil can be warmer, or around sprinkler heads where turf is mowed more closely.

Cultural Control in the Landscape and Garden

In the landscape, you easily can control crabgrass by mulching, hoeing, and hand pulling when the plants are young and before they set seed. You also can control this weed with solarization. Several chemical herbicides are available but often aren't necessary.

Mulching with wood products (e.g. wood chips or nuggets), composted yard waste, or synthetic landscape fabrics covered with mulch will reduce crabgrass in shrub beds and bedding plants and around trees by blocking sunlight needed for its germination, establishment, and growth. Mulch depth depends on the size of the particles; coarse mulch might need to be 3 to 6 inches deep to control all weeds, while

a finer mulch might need to be only 2 to 3 inches deep. Plan to replenish landscape mulches periodically because of decomposition, movement, or settling.

Organic mulches that have been on the soil for a while decomposing can provide an adequate growth medium for weeds to germinate and grow in. If crabgrass is germinating in the mulch, move it about with a rake to reduce seedling establishment. Hand pull escaped crabgrass plants before they set seed. Flaming with a hand-held burner will control crabgrass seedlings, but be careful not to set fire to the mulch if it is wood chips, compost, or another flammable material.

Soil solarization with clear plastic prior to planting is effective for eradicating crabgrass plants and seed if you apply it during periods of high solar radiation. For more information about this process, see *Pest Notes: Soil Solarization for Gardens & Landscapes* in References.

Chemical Control

Crabgrass is easy to control in both turfgrass and ornamental beds if you apply preemergent herbicides before it germinates or postemergent herbicides after it germinates. Avoid using chemical herbicides in vegetable gardens because of the variety of crops grown and planted there.

Read the label to make sure the product is safe to use on your turf type and around the ornamentals in your landscape. The active ingredients listed below can be found under different brand names; for a partial list, see Table 3.

Table 2.
Periods of Active Growth for Cool- and Warm-season Turf Species.

Turfgrass species	Period of active growth
Cool-season turf	
bentgrass	March–June, September–November
bluegrass, Kentucky	late February–late May, October–December
fescue, fine	March–June, October–December
fescue, tall	March–June, October–December
ryegrass, annual (for overseeding)	October–May
ryegrass, perennial	February–June, October–December
Warm-season turf	
bermudagrass	April–late September
dichondra	April–October
kikuyugrass	February–November
St. Augustinegrass	March–October
zoysiagrass	April–October

Table 3.
Examples of Preemergent and Postemergent Herbicides with Brand Names.

Herbicide	Brand name	Homeowner or professional use?	For use on turf?
Preemergents			
bensulide	Bensumec, Pre-San	homeowner	yes
dithiopyr	Dimension, Preen	professional	yes
oryzalin	Surflan, Weed Impede	homeowner	yes
oxadiazon	Ronstar	professional	yes
pendimethalin	Pendulum, Pre-M, Scotts	homeowner	yes
prodiamine	Barricade	professional	yes
trifluralin	Vegetable and Ornamental Weeder	homeowner	no ¹
Postemergents			
dithiopyr	Dimension, Preen	professional	yes
fluazifop	Poast, Grass Getter, Ornamec	homeowner	no
quinclorac	Drive, Momentum, Trimec Crabgrass	homeowner	yes
sethoxydim plus oil	Fusilade	homeowner	no

¹ Warm-season turf (bermudagrass and St. Augustine only). Will injure cool-season species.

Preemergent herbicides available for home gardeners for crabgrass control in warm-season grasses (bermudagrass and zoysiagrass) and cool-season grasses (Kentucky bluegrass, fine fescue, tall fescue, and perennial ryegrass) include benefin, bensulide, pendimethalin, and trifluralin.

Professional pesticide applicators also can use dithiopyr, oxadiazon, and prodiamine. Oryzalin also is available for home gardeners, but it is for use in warm-season turf (bermudagrass and zoysiagrass) only.

Apply preemergent herbicides before crabgrass germinates, usually around the first of March. Many fertilizers contain a preemergent herbicide (weed and feed) so that the spring fertilization and preemergent treatments can be done at the same time. However, timing is critical, and weed and feed products often are applied at the wrong time.

Crabgrass has germinated as early as Jan. 30 in Bakersfield and Fresno on warm days. If a preemergent were applied at that time it could start to break-down in 4 to 5 months, and a second application could be required. Follow label directions during application and make sure there is adequate overlap, as the herbicide is applied in the lawn to prevent strips of weeds from coming up.

There are few **postemergent herbicides** available for crabgrass control in lawns. Dithiopyr currently can be applied to home lawns but only by professional applicators. Dithiopyr provides good preemergent control of seeds and con-

trols emerged crabgrass plants up to the third leaf stage.

Quinclorac often is sold in a ready-to-use spray bottle for the homeowner; however, crabgrass control is only partial, and some species have shown resistance to this product. Companies have stopped making products containing the active ingredients MSMA and DSMA, which have been used since the 1950s, and some companies are substituting quinclorac.

Use postemergent herbicides when crabgrass is small (in the 1- to 3-leaf stage). If the crabgrass is larger, it takes more herbicide to control it, and there is a greater chance of injury to the turfgrass.

In **ornamental beds**, home gardeners can use the preemergent herbicides benefin, oryzalin, and trifluralin to control crabgrass. Landscape professionals also can use oxadiazon, pendimethalin, and prodiamine. You can use these chemicals either before crabgrass has germinated or after you've removed the weed by hoeing or hand pulling but before another flush of germination.

Use a postemergent selective herbicide (fluazifop, quinclorac, or sethoxydim plus oil) to control crabgrass over or around most broadleaved ornamentals. You also can use nonselective herbicides such as glufosinate-ammonium, glyphosate, or pelargonic acid. Use nonselective herbicides with care to prevent them from harming desirable shrubs. All of these herbicides are available for use for home gardeners.

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ILLUSTRATIONS: Figs. 1-2, C. L. Elmore; Fig. 3, J. K. Clark; Figs. 4-5, J. M. DiTomaso; and Fig. 6, J. L. Lockwood and C. DeWees.

University of California scientists and other qualified professionals have anonymously peer reviewed this publication for technical accuracy. The ANR Associate Editor for Urban Pest Management managed this review process.

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.

Produced by **UC Statewide Integrated Pest Management Program**
University of California, Davis, CA 95616

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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 creeks, 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 the 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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