



# Weed Control in Home Lawns

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Weeds can be major pests of home lawns. Due to differences in color, leaf size, shape and growth habit, weeds detract from the natural beauty of desirable turfgrasses. Additionally, weeds compete with turfgrasses for sunlight, soil moisture, nutrients and space. Many weeds can quickly become the dominant species in a lawn.

## Weed Control Methods

There are three primary methods of controlling weeds in home lawns. Each method, when used alone, will not usually control all weeds. To consistently control lawn weeds, use a combination of all three methods.

### Cultural Practices

The first line of defense against weeds is to follow cultural practices that promote vigorous turfgrass growth and development. Weeds do not easily invade turfgrasses that are properly fertilized and watered and that are mowed at the correct height and frequency. Weeds appear primarily in bare or thin areas of the turfgrass, which may be due in part to one or more of the following:

- Use of non-adapted turfgrasses.
- Improper fertilization (too much or too little, or wrong application date or N-P-K ratio).
- Improper watering (too much or too little).
- Improper mowing procedures (cutting height is too low or too high, or the turfgrass is not mowed at correct time intervals).
- Failure to control diseases and insects.
- Excessive amounts of thatch.

Visit [www.GeorgiaTurf.com](http://www.GeorgiaTurf.com) for additional information on turfgrass maintenance practices.

The impact of proper cultural practices on a lawn weed control program cannot be overemphasized. Properly maintained turfgrasses are more competitive with weeds than turfgrasses that do not receive good cultural practices. The use of herbicides without following approved cultural practices will not result in a high quality, weed-free lawn.

### Mechanical Methods

Many weed species do not tolerate frequent mowing. Following mowing frequency and cutting height guidelines can limit development of many weed species; however, it is time consuming and not effective for the control of most perennial weeds. Hand-pulling a “strange” or “new” weed when it first appears in the lawn will help prevent the spread of that weed.

### Herbicides

An herbicide is a chemical used to control weed growth and development. Before an herbicide is labeled for use in home lawns, it is thoroughly investigated by chemical companies, land-grant universities and various regulatory agencies. At rates required for weed control, the herbicide must be proven safe to humans, the environment and turfgrasses.

Herbicides are important components of a lawn weed control program. Herbicides should be applied at specific times of the year and will control only certain weed species. Many herbicides cannot be used on every turfgrass

species. The product label is the best reference for safe and effective use of any herbicide. Always read the label prior to using turfgrass herbicides.

## Weed Life Cycles

Weeds can be divided into categories based on life cycles. With most weeds, an herbicide must be applied at a specific time of year for effective control. Applying an herbicide too early or too late often leads to poor weed control.

### Annual Weeds

Annual weeds complete their life cycle in less than one year and reproduce by seed. Annuals may be further divided into summer and winter annual weeds.

#### *Summer Annuals*

Summer annuals germinate in the spring months, live during the summer and mature in the fall months. Examples include crabgrass, goosegrass, lespedeza and prostrate knotweed.

#### *Winter Annuals*

Winter annuals have a life cycle opposite from summer annuals. Winter annuals germinate in the late summer and early fall months, live during the winter and die in the late spring or early summer with the onset of high air temperatures. Examples include annual bluegrass, common chickweed, henbit and swinecress.

### Biennials

Biennial weeds live for two years. During the first year, biennials germinate from seed and produce vegetative growth. In the second year, biennials form a seed stalk, produce seed and die. Biennials are not as common in lawns as annual and perennial weeds. Examples include wild carrot and common mullein.

### Perennials

Perennial weeds are usually more difficult to control than annual weeds. In addition to reproducing by seed, perennial weeds reproduce by vegetative structures such as stolons (bermudagrass), rhizomes (red sorrel), tubers (nutsedge), fleshy taproots (dandelion) and bulbs (wild garlic).

## Types of Herbicides

### Selective

A selective herbicide controls certain plant species without seriously affecting the growth of other plant species. The majority of herbicides used in home lawns are selective herbicides.

### Nonselective

Nonselective herbicides kill plants regardless of species. Since these herbicides indiscriminately control plants, nonselective herbicides are used only on a spot treatment basis in the lawn or to control undesirable plant growth along driveways and sidewalks. Glyphosate (Roundup, Kleenup, etc.) is a nonselective herbicide.

### Preemergence

Preemergence herbicides are applied to lawns prior to weed seed germination. This group of herbicides controls weeds during the weed seed germination process but does not actually prevent weed seed germination. When weeds are seen in the lawn, it is too late to apply a preemergence herbicide. When applied in the early spring months, preemergence herbicides provide season-long control of summer annual weeds such as crabgrass, goosegrass and sandbur. When applied in the early fall months, this group of herbicides will control many winter annual weeds such as annual bluegrass, common chickweed and henbit.

Preemergence herbicides are recommended only for turfgrasses that have been established for a minimum of one year. Severe injury can result if a preemergence herbicide is applied after seeding (Examples: common bermudagrass, tall fescue, ryegrass, centipedegrass) or after sprigging or sodding (bermudagrass, St. Augustinegrass, zoysiagrass, centipedegrass). Preemergence herbicides form the backbone of weed control programs. They do not control all weeds that may be present in a lawn, but they are effective for many of the most common lawn weeds.

### Postemergence

Postemergence herbicides are applied directly to emerged weeds. In contrast to preemergence herbicides, this group of herbicides controls only weeds that are emerged and actively growing at the time of treatment. Postemergence herbicides used for lawn weed control are systematic or translocated (moved) in the plant system that transports food and water. It is not necessary to “drown” the weed with a postemergence herbicide. Any spray that runs off the weed is usually wasted and does not cause increased control.

## Advantages of Preemergence and Postemergence Herbicides

Some of the advantages of using preemergence herbicides compared to postemergence herbicides are:

- Preemergence herbicides are applied prior to weed seed germination and emergence.
- Many preemergence herbicides are available in granular formulations. Granules are easier to apply than sprayable formulations. Additionally, granules are not susceptible to spray or vapor drift that can occur with sprayable formulations.
- With the exception of atrazine (Aatrex, Purge II, Atrazine Plus), most ornamental shrubs, trees and flowers are tolerant of preemergence herbicides. In fact, DCPA (Dacthal), oryzalin (Surflan), benefin (Balan) and benefin + oryzalin (XL) are labeled for use on selected ornamentals. Postemergence herbicides can cause injury to ornamentals unless label precautions are followed.
- Preemergence herbicides do not cause injury to established turfgrasses. In contrast, most postemergence herbicides will slightly injure or yellow turfgrasses for a short period after treatment.

The advantages of postemergence herbicides when compared to preemergence herbicides are:

- Postemergence herbicides can be applied as a spot treatment directly to a weed infestation. Preemergence herbicides are usually applied to an entire lawn area.
- Postemergence herbicides are less costly than preemergence herbicides because spot treatments can be used.
- Postemergence herbicides generally control a broader spectrum of weed species than preemergence herbicides.

Unfortunately, a single selective preemergence or postemergence herbicide that will control all weeds is not available. Use of preemergence and postemergence herbicides together will be required in most lawns to maintain an acceptable level of weed control.

## Herbicide Formulations

Herbicides are not sold as pure chemicals. Herbicides are formulated with various solvents, emulsifiers and other additives to improve the storage life, application ease and handling characteristics of the active ingredient. Lawn herbicides are available in many different formulations.

### Liquid Formulations

Liquid formulations are easy to measure, mix and apply with hose-end sprayers or compressed air sprayers. Aerosol sprays or foams are also available for spot weeding (for example: Weed-B-Gon).

### Dry Formulations

Depending upon the herbicide, dry formulations are either mixed with water and sprayed on the lawn or are applied directly to the lawn.

#### *Wettable Powders*

The active ingredient is carried on a small, solid particle. Wettable powders are mixed with water and sprayed on the lawn. This formulation does not form a true solution. Shake or agitate the spray tank often to keep the powder suspended in the spray tank and improve uniformity of application (for example: Atrazine 90WP).

#### *Granules*

The active ingredient is carried on a granule or small pellet. Granules are not mixed with water but are applied directly to the lawn with a drop or rotary spreader (for example: Balan 2.5G, Halts 1.71G).

## Fertilizer-Herbicide Mixtures

Preemergence and postemergence herbicides are formulated with dry fertilizers. These mixtures enable a weed-and-feed treatment in the same application or trip over the lawn. Although applying a weed-and-feed treatment is convenient, consider certain factors before application. Depending on the turfgrass, the time of year an herbicide should be applied may not coincide with the time a year a fertilizer should be applied. The nutrient of greatest concern is nitrogen. Weed-and-feed products containing nitrogen should be avoided until the 4-inch soil temperature is consistently 65° F. Some combination products contain potassium as the only nutrient, which is satisfactory for late winter and early spring applications.

For example, centipedegrass should not receive spring fertilization until complete green-up or until it has recovered from winter dormancy. When centipedegrass has fully greened-up, it is generally too late to apply a preemergence herbicide since many weeds have already emerged. There are exceptions. Applications of a dinitroaniline herbicide on a 0-0-7 carrier have no associated nitrogen and the end-user may still apply a preemergence herbicide.

Atrazine is sold with a dry fertilizer carrier under the brand name Bonus S. Atrazine has both preemergence

and postemergence activity on a wide variety of annual broadleaf weeds. On centipedegrass or St. Augustinegrass, atrazine-fertilizer products can be applied after green-up and provide control of many annual broadleaf weeds.

Postemergence weed-n-feed mixtures contain 2,4-D, MCPP and dicamba. These herbicides control broadleaf weeds primarily by foliage absorption. For most effective control, apply broadleaf herbicide-fertilizer mixtures when the weed foliage is moist from a light dew or rain. Moisture on the weeds at the time of application will increase herbicide absorption and control. In addition to foliage absorption, dicamba can also be absorbed by plant roots. Root absorption increases the effectiveness of dicamba for weed control; however, dicamba can also be absorbed by the roots of desirable ornamentals. Do not apply weed-n-feed mixtures that contain dicamba over the root zones of ornamentals. Never directly apply a broadleaf herbicide-fertilizer mixture to ornamentals. The dicamba that may be in the mixture can severely injure ornamentals through root uptake.

## Herbicide Use

### Newly Established Lawns

Newly seeded or sprigged turfgrasses are less tolerant of herbicides than established turfgrasses. Pre-emergence herbicides should not be applied to newly seeded turfgrasses; however, dinitroaniline herbicide may be used once the turf has matured and established a root system. For example, pendimethalin may be applied in the spring to fall-seeded turfgrasses after they have been mowed four times.

Postemergence herbicides may be used to control weeds in newly established lawns. A general rule is to apply a postemergence herbicide at half the recommended rate after three to four mowings. Delaying the postemergence treatment allows the turfgrass seedlings to become established and improves their tolerance to herbicides. On newly sprigged turfgrasses, delay the postemergence application until the sprigs have rooted and are actively growing. Since many weeds will not be controlled by the one-half rate of the herbicide, repeat the treatment 7 to 10 days after the first application.

### Established Lawns

Established turfgrasses typically have tolerance to herbicides labeled for use on home lawns. Apply pre-emergence herbicides in the fall and in the spring according to the following schedule:

### Fall

When temperatures drop to 65-70° F at night, apply pre-emergence herbicides to control winter annual weeds such as annual bluegrass, henbit and common chickweed. Recommended dates are August 15 to September 15 in north Georgia and September 1 to 15 in south Georgia.

### Spring

Apply herbicides to control summer annual weeds such as crabgrass and goosegrass prior to soil temperatures reaching 55° F. Recommended dates are March 1 to 20 in north Georgia and February 15 to March 15 in south Georgia.

Postemergence herbicides are applied after annual weeds emerge or when new growth or regrowth of perennial weeds appears. Follow these guidelines for better weed control and improved turfgrass tolerance:

- Apply postemergence herbicides in the fall and late spring months. Air temperatures are cooler at this time of year, resulting in better turfgrass tolerance to herbicides. Also, perennial and many annual weeds are actively growing during these times of year and are easier to control with postemergence herbicides.
- Do not apply postemergence herbicides to turfgrasses and weeds that are stressed due to high temperatures or drought. Turfgrass tolerance to postemergence herbicides decreases at air temperatures greater than 90° F or when turfgrasses are drought-stressed. Also, weed control is poorer when herbicides are applied to weeds in a stressed condition than when applied to actively growing weeds.
- Do not apply postemergence herbicides during the green-up (transition from winter dormancy to active growth) process of warm-season turfgrasses. The risk of injury from postemergence herbicides is greater during the green-up process than when the turfgrass is fully dormant or actively growing.

### Application Equipment

Successful herbicide use depends on using the right equipment and application procedures. The amount of herbicide to be applied to a lawn is listed on the label. For home lawns, rate recommendations are usually given in the amount (pounds, fluid or dry ounces) of herbicide product per 1,000 square feet.

Never apply more than the recommended rate of an herbicide to a home lawn. The adage, "If a little is

good, more is better,” does not apply to herbicides. Herbicides can severely injure turfgrasses when applied in excess.

Regardless of the type of equipment, herbicides must be evenly and uniformly applied to the lawn. Excessive spray or granular overlap increases the amount of herbicide per unit area and also increases the risk of turfgrass injury. If spray or granular application patterns do not overlap, areas in the lawn will not be treated. The result often appears as streaks of weeds in the lawn.

### Liquid Formulations

Liquid formulations are diluted with water and sprayed on the lawn. Handheld pump-up sprayers and hose-end applicators are commonly used for applying liquid herbicides. Unless the square footage of the lawn area is known, it is difficult to apply herbicides at the correct rate. Measure your lawn to determine the square footage (for example, 20 ft. x 50 ft. = 1,000 sq. ft.). Once the square footage of the lawn is known, it is easy to determine the amount of herbicide required.

**Example:** A home lawn has 8,000 square feet of turfgrass. The recommendation for Surflan is 2 ounces per 1,000 square feet. How much Surflan 4AS is necessary to treat the lawn?

$$\begin{aligned} 8,000 \text{ sq. ft.} \times 2 \text{ oz./1,000 sq. ft.} = \\ 16 \text{ oz. (1 pint) Surflan AS} \end{aligned}$$

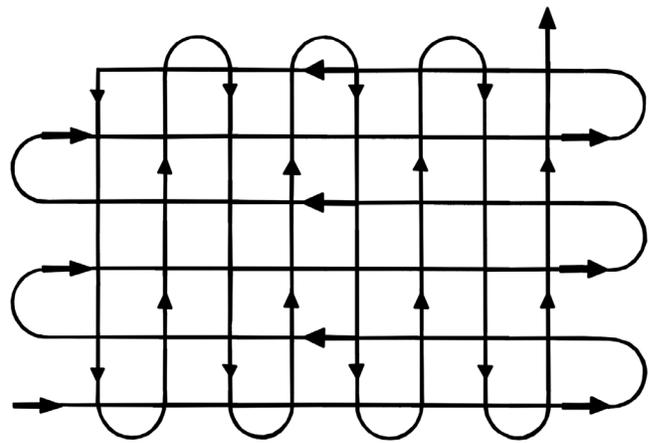
Apply liquid formulations in a minimum of 1 gallon of water per 1,000 square feet. Prior to mixing the herbicide, practice applying 1 gallon of water to a 1,000 square-foot turfgrass area.

### Dry Formulations

Granular herbicides may be applied with a drop or rotary spreader. When applying granular herbicides, divide the amount of herbicide needed into two equal parts. Apply the herbicide in two directions at right angles to each other (Figure 1). Applying the herbicide in this manner will ensure a more uniform distribution and help prevent skips and excessive overlap.

### Herbicide Safety Precautions

Always read the herbicide label to determine recommended handling precautions. Avoid inhaling sprays or dusts. If herbicides are spilled on the skin, wash the contaminated skin thoroughly with soap and water. Do not spray with equipment that has loose hoses or connections. Mix and use only the amount of herbicide necessary to treat the lawn. Always store herbicides in their original containers. Place



**Figure 1.** Apply granular herbicides in two directions at right angles to each other.

herbicides in dry areas that are protected from freezing temperatures. Keep pesticides out of the reach of children, pets and livestock.

### Home Lawn Herbicides

Numerous herbicides are available for use on turfgrasses. While most of these herbicides may be used on home lawns, many are not sold in small containers or at retail stores. The following herbicides are usually available at most retail stores that sell lawn and garden products. Refer to the current edition of the *Georgia Pest Management Handbook* for further information on the use of these herbicides, including application rates, formulations and weed response. Always read the label of any chemical prior to using on your lawn.

### Preemergence Herbicides

*atrazine (Purge II – 2 lbs/gallon, Atrazine Plus – 1.2 lbs/gallon, Aatrex 4L)*

Atrazine is available in small containers for use on home lawns. Depending upon the brand, atrazine is labeled for centipedegrass, zoysiagrass, St. Augustinegrass and dormant bermudagrass. Atrazine can be applied to actively growing and dormant centipedegrass or St. Augustinegrass. Bermudagrass can be injured if treated with atrazine while actively growing. Atrazine should not be applied to tall fescue, Kentucky bluegrass or when warm-season grasses are emerging from winter dormancy.

Purge II is not labeled for use on zoysiagrass. Atrazine has preemergence and postemergence activity on a wide variety of broadleaf weeds. Activity on summer annual grasses such as goosegrass and crabgrass is generally poor. Atrazine Plus may be applied to newly sprigged centipedegrass, St. Augustinegrass and

zoysiagrass after sprigs have rooted and are actively growing. DO NOT apply atrazine over the root zone of desirable trees, shrubs or flowers. Atrazine is also available on a dry fertilizer carrier under the trade name Bonus S (Scotts) and others.

***benefin (Balan 2.5G)***

Balan is a granular herbicide that controls most annual grasses and certain broadleaf weeds. Balan is suitable to use near ornamental trees, shrubs and flowers. The active ingredient in Balan, benefin, is available on dry fertilizer carriers under the trade names Crabgrass Preventer (Hi-Yield), Crabgrass Preventer (Sta-Green) and Crabgrass Green (Greenview).

***benefin + oryzalin (XL 2G)***

XL is a granular herbicide that controls most annual grasses and certain broadleaf weeds. XL is safe to use near ornamental trees, shrubs and flowers.

***DCPA (Dacthal 75W) and (Weed Killer Granules 5G)***

DCPA is available as a 75 percent wettable powder and as a 5 percent granular product. DCPA may also be available on dry fertilizer carriers under various trade names. DCPA controls most annual grasses and certain annual broadleaf weeds. DCPA is generally safe to use on newly seeded turfgrasses after seedlings have germinated and reached a height of 2 to 3 inches. DCPA can be used around ornamental trees, shrubs and flowers.

***dithiopyr (Dimension 1EC, 2EW, 40WP, others)***

These products provide preemergence control of annual grasses and certain annual broadleaf weeds. Dimension will also provide postemergence control of crabgrass (when treated prior to the tillering stage of growth). Apply as a spring or fall application. Bermudagrass can be overseeded with perennial ryegrass six to eight weeks after a Dimension application. For other turfgrass areas do not reseed, overseed or sprig treated areas for two and a half to four months after treatment (see label).

***indaziflam (Specticle 20WSP, Specticle Flo)***

Apply Specticle for preemergence control of annual bluegrass, crabgrass, goosegrass, annual sedges and broadleaf weeds in warm-season grasses. Use only on established lawns that are not affected by disease, traffic or stresses. Do not apply to desirable cool-season grasses. Indaziflam may affect sensitive grasses downslope from treated areas. Do not use on slopes uphill. See label for further information before using this herbicide.

***oryzalin (Surflan 4AS, others)***

Surflan is a liquid formulation that is available in 1-quart containers. Surflan will control most annual grasses and certain annual broadleaf weeds. Surflan is suitable to use near ornamental trees, shrubs and flowers.

***pendimethalin (Halts 1.71G, Pendulum 2G, Pendulum Aqua Cap 3.8CS, Pendulum 3.3EC)***

Pendimethalin controls most annual grasses and certain annual broadleaf weeds. DO NOT use pendimethalin on newly seeded areas until after the fourth mowing. Pendimethalin is safe to use near ornamental trees, shrubs and flowers. Pendimethalin is sold on dry fertilizer carriers under the trade names Turf Builder plus Halts (Scotts) and Crabgrass Preventer plus Fertilizer – Step 1 (Scotts).

***proflam (Barricade 4FL, Barricade 65WG, Cavalcade 65WDG, Stonewall 65WDG, Regalkade 0.5G)***

Proflam is a selective preemergence herbicide that controls grassy and broadleaf weeds in established lawns. Proflam can be used on most major warm- and cool-season turfgrass species used for residential lawns. For optimum weed control, proflam should be activated by at least 0.5 inch of rainfall or irrigation before weed seeds germinate and within 14 days following application. To avoid turfgrass injury, do not apply to newly laid sod until the sod has rooted and exposed edges have filled in. Proflam may be used on newly sprigged or plugged bermudagrass at rates not to exceed 0.5 lb a.i. per acre if stolon rooting inhibition may be temporarily tolerated. Do not apply proflam to turf stressed by conditions such as drought, low fertility or pest damage.

***simazine (Princep 4L, WynStar, others)***

Apply simazine in October or November for preemergence control of winter annual weeds in warm-season grasses. Apply from December through February for late postemergence control of winter annuals. Apply low rate for annual bluegrass control or high rate for winter annual broadleaf control. DO NOT overseed with desirable turfgrass within four months before or six months after treatment. DO NOT apply more than 1.0 lb. ai/acre on newly sprigged turfgrass or on hybrid bermudagrass such as Tifway.

## Postemergence Herbicides

### *2,4-D + MCPP (Weed-B-Gon Ready Spray; Weed-B-Gon RTU)*

2,4-D and MCPP are phenoxy herbicides that have postemergence activity on a wide range of annuals and perennial broadleaf weeds. They will not control weedy grasses. Newly sprigged turfgrasses have good tolerance when these herbicides are applied at recommended rates. 2,4-D + MCPP is labeled for use on Kentucky bluegrass, bermudagrass, carpetgrass, centipede grass, tall fescue and zoysiagrass. This herbicide mixture is not recommended for use on St. Augustinegrass. Temporary injury (yellowing of foliage) can occur on centipede grass and carpetgrass. DO NOT apply to turfgrasses if air temperatures are expected to exceed 85° F within 24 hours of application. Avoid applications during the spring transition of warm-season grasses. DO NOT allow the spray to contact the foliage of desirable ornamentals.

### *2,4-D + MCPP + Dicamba (33 Plus, Ace Lawn Weed Killer)*

This mixture is often referred to as a three-way mixture since it contains three herbicides. This three-way herbicide controls a wide spectrum of broadleaf weeds but does not control weedy grasses. Newly seeded lawns may be treated after three or four mowings. This three-way herbicide is recommended for use on Kentucky bluegrass, bermudagrass, tall fescue and zoysiagrass. Low rates and spot treatments will minimize the injury potential of the herbicide on centipede grass and St. Augustinegrass.

### *atrazine (Purge II – 2 lbs/gallon; Atrazine Plus – 1.2 lbs/gallon)*

Refer to comments on atrazine applied as a preemergence treatment.

### *carfentrazone (Quicksilver – 1.9 lbs/gallon)*

Carfentrazone is labeled for all established turfgrasses for annual and perennial broadleaf weed control. Carfentrazone may be used for burndown and control of silvery thread moss (*Bryum argenteum*) occurring in turf. To control silvery thread moss, apply Quicksilver Herbicide at 6.7 fluid ounces of product per acre followed by a second application in two weeks. Tall fescue may exhibit a slight yellowing discoloration occurring within three to five days after application under some conditions. Recovery typically occurs within four to seven days. Carfentrazone can be applied to the following species of turfgrass at seven days or more after emergence for species established by both seeding and sprigging: hybrid bermudagrass,

common bermudagrass, St. Augustinegrass, tall fescue, perennial ryegrass and Kentucky bluegrass. Application to zoysiagrass should be delayed until at least 14 days after emergence to avoid extended discoloration. Including a non-ionic surfactant at 0.25% v/v may improve efficacy.

Carfentrazone is sold in combination with 2,4-D, dicamba and MCPP as Speed Zone Herbicide. Speed Zone is labeled for most cool-season turfgrasses, bermudagrass and zoysiagrass. Speed Zone Southern contains a different concentration of these components and is labeled for all major warm- and cool-season turfgrasses for broadleaf weed control.

### *fenoxaprop*

Acclaim Extra (0.57 lb/gal) is used for postemergence control of annual grassy weeds, such as crabgrass and goosegrass, and suppression of some perennial grass weeds in established Kentucky bluegrass, tall fescue and zoysiagrass. Acclaim Extra does not control broadleaf weeds or sedges. Tank mixes of Acclaim Extra and triclopyr ester may be used to suppress bermudagrass in zoysiagrass and tall fescue when used in a treatment program. Do not apply Acclaim Extra at more than 2.75 fluid ounces/1000 sq. ft. per growing season. Do not apply to seedling fine leaf fescue, tall fescue or perennial ryegrass less than four weeks old. Broadleaf herbicides such as 2,4-D or MCPP may reduce the effectiveness of Acclaim Extra Herbicide. Do not apply Acclaim Extra within 21 days following a 2,4-D or MCPP application, or five days before 2,4-D or MCPP application.

### *foramsulfuron*

Revolver (0.19 lb/gallon) is a postemergence herbicide for bermudagrass and zoysiagrass lawns. Do not apply Revolver to cool-season turfgrasses, centipede grass or St. Augustinegrass. Revolver can be used to remove clumps of cool-season grasses, annual bluegrass, goosegrass and henbit from desired turf. Treatments should be applied when turf has resumed active growth and removal of ryegrass is desired. Efficacy of Revolver improves with warm air temperatures and herbicide rate. Addition of nitrogen fertilizer in the tank mixture at the time of application may improve turf quality by increasing turf growth during transition from overseeded grasses. Revolver may be applied for annual bluegrass control up to two weeks prior to overseeding bermudagrass and zoysiagrass in the fall. Weed control may be reduced if application is made in the presence of heavy dew, fog and mist/rain or when weeds are under stress due to drought.

### *halosulfuron*

Sedgehammer (75DF) is a selective herbicide for post-emergence control of sedges such as purple and yellow nutsedge in established lawns. Sedgehammer may be applied to most major warm- and cool-season turfgrasses. For best results, apply 2/3 to 1 1/3 ounces of product per acre after nutsedge has reached the three to eight leaf stage of growth. A second treatment may be required six to 10 weeks after the initial treatment. Use the lower rate in light infestations and the higher rate in heavy infestations. No more than four applications can be made with the total use rate not exceeding 5 1/3 ounces of product per acre per season. Use 0.25% v/v of a nonionic surfactant (1 quart per 100 gallons of spray solution) for broadcast applications. Use only high quality nonionic surfactants that contain at least 80% active ingredient.

### *imazaquin (Image – 1.5 lbs/gallon)*

Imazaquin is labeled for use only in established bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. All other turfgrasses can be severely injured by imazaquin. This herbicide is primarily used for the postemergence control of annual sedges, yellow nutsedge, purple nutsedge and wild garlic. Imazaquin will also control numerous winter annual weeds and sandbur.

### *MCPP + 2,4-D + dicamba (Weed-B-Gon for Southern Lawns2; Weed-B-Gon Lawn Weed Killer3)*

This three-way mixture contains more MCPP and less 2,4-D than the commonly sold 2,4-D + MCPP + dicamba mixtures (see above). The lower concentration of 2,4-D in this mixture improves the tolerance of St. Augustinegrass. DO NOT, however, use this herbicide on St. Augustinegrass at air temperatures at or above 90° F and under conditions of high relative humidity. MCPP + 2,4-D + dicamba is labeled for use under conditions of high relative humidity. MCPP + 2,4-D + dicamba is labeled for use on bermudagrass, bahiagrass, Kentucky bluegrass, centipedegrass, tall fescue and St. Augustinegrass. Only the low rate is recommended for use on St. Augustinegrass. Avoid applications during the spring transition for warm-season grasses. This herbicide controls a wide range of broadleaf weeds but does not control weedy grasses.

### *quinclorac*

Drive (75 DF, Drive XLR8 1.5 SL) is a postemergence herbicide for grassy and broadleaf weed control. Drive may be applied to bermudagrass, Kentucky bluegrass and tall fescue lawns for selective crabgrass, clover and broadleaf weed control. Do not apply to fine

fescue unless it is part of a seed blend. Do not apply to bahiagrass, carpetgrass, St. Augustinegrass, centipedegrass, dichondra or lawns or turf where desirable clovers are present. Addition of methylated seed oil is recommended. Bermudagrass and tall fescue may be seeded before, during or after Drive applications, while Kentucky bluegrass may be seeded 28 days after treatments.

### *sethoxydim (Segment, Vantage, others)*

Vantage is recommended for use only on centipedegrass and fine fescue (creeping Red, chewings, hard fescue). All other turfgrasses, including tall fescue, can be severely injured by Vantage. Vantage will control most annual grasses and suppress the growth of perennial grasses such as bahiagrass. This herbicide will not control broadleaf weeds or nutsedge. Vantage is very safe to use near trees and other broad-leaf ornamental plants. Vantage may be used on established centipedegrass or newly planted centipedegrass that has 3 inches of new stolon growth.

### *simazine (Princep 4L, WynStar 4L, others)*

Apply December through February for late post-emergence control of winter annuals in warm-season turfgrasses. Apply the low rate for annual bluegrass control or the high rate for winter annual broadleaf control. DO NOT overseed with desirable turfgrass within four months before or six months after treatment. DO NOT apply more than 1.0 lb. ai/acre on newly sprigged turfgrass or on hybrid bermudagrass such as Tiflawn, Tifway and Ormond.

### *sulfentrazone*

Dismiss (4 lbs/gallon) is a postemergence herbicide labeled for most major warm- and cool-season turfgrasses. Use lower rates on cool-season turfgrass than warm-season turf due to injury concerns. Dismiss controls annual and perennial sedges, broadleaf weeds and suppresses goosegrass. Dismiss may be used on seeded, sodded or sprigged turfgrasses that are well established. Applications of Dismiss can be initiated following the second mowing provided the turfgrass has developed into a uniform stand with a good root system. Turfgrass injury could result from application of this product on turfgrass that is not well established or has been weakened by stresses such as unfavorable weather conditions, disease, chemical or mechanical damage. Dismiss may cause temporary discoloration to St. Augustinegrass and zoysiagrass.

Sulfentrazone is also found in the combination products Surge and Q4. Surge contains sulfentrazone, 2,4-D, dicamba and MCPP and effectively controls

annual, biennial and perennial broadleaf weeds. Surge may be applied to dormant bermudagrass, zoysiagrass and bahiagrass but do not apply during spring green-up or in the fall during the transition period between active growth and dormancy. Q4 contains sulfentrazone, quinclorac, 2,4-D and dicamba for broadleaf weed, crabgrass and nutsedge control. For best results, add 0.25 lb of active ingredient per acre of quinclorac (Drive) and 0.06 to 0.19 lb of active ingredient per acre of sulfentrazone (Dismiss) for crabgrass and nutsedge control, respectively.

#### ***sulfosulfuron***

Certainty (75DF) is labeled for bermudagrass, St. Augustinegrass, zoysiagrass and centipedegrass. Certainty selectively controls sedges, kyllingas and tall fescue. A second application of 0.75 to 1.25 ounces per acre may be made four to 10 weeks after initial treatment, if needed. Some chlorosis or stunting of the desirable turf may occur following application. Use of a nonionic surfactant is required. Certainty suppresses annual bluegrass and controls or suppresses roughstalk bluegrass.

#### ***thiencarbazone + iodosulfuron + dicamba*** (Celsius 68WG)

This mixture is intended for commercial application (licensed applicators only) to residential lawns and other turf areas for controlling annual and perennial broadleaf weeds and grasses in warm-season grasses. For certain weeds, a second application made two to four weeks later may be needed for complete weed control (see label). Total amount of product applied in a calendar year must not exceed 7.4 oz of product per acre. Do not apply to lawns with desirable carpetgrass or bahiagrass.

### **Non-selective Herbicides (spot treatments or dormant applications)**

#### ***glyphosate (Gly Star Pro, Razor, Roundup Pro, Touchdown, numerous others)***

Glyphosate is a non-selective, postemergent, systemic herbicide. While glyphosate has persistence in soil for a limited time, it has no preemergence activity. It is generally non-selective and gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid. Glyphosate moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within two to four days, but on most perennial weeds may not occur for seven days or more. Cool or cloudy

weather following treatment may slow activity of this herbicide and delay development of visual symptoms.

Visible effects are a gradual wilting and yellowing of the plant, which advances to complete browning of above-ground growth and deterioration of underground plant parts. Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Always use the higher rate of this product within the recommended range when weed growth is heavy or dense or weeds are growing in an undisturbed (noncultivated) area. Do not treat weeds under poor growing conditions such as drought stress, disease or insect damage, as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dew, dust or grass clippings.

#### ***Glufosinate***

Finale (1 lb/gallon) is a nonselective contact herbicide. Best results are obtained when weeds are actively growing. Weed control may be reduced when applications are made to weeds under stress due to drought or cool temperatures. Finale may be used as a spot- or directed-spray application using 1.5 to 4 fluid ounces per gallon of water, depending upon the weed and stage of growth. Spray undesirable vegetation foliage on a spray-to-wet basis but do not apply beyond runoff. Thoroughly clean the sprayer following use. Finale may be used for trimming and edging landscape areas such as around individual trees and shrubs, landscape beds, foundations, fences, driveways, paths, parking areas, paved paths, and around signs and light posts. Plants may be safely transplanted into treated areas. For control of weeds emerging from seed, the use of Finale in a tank mix with preemergence herbicides is recommended. If spraying in areas adjacent to desirable plants, use a shield made of cardboard, plywood or sheet metal while spraying to help prevent spray from contacting foliage of desirable plants.

#### ***diquat***

Reward (2 lbs/gal) is a nonselective herbicide that rapidly controls above-ground plant growth. Avoid contact with desirable turfgrasses. Reward is a contact/desiccant herbicide and complete coverage of targeted weeds is essential. For best results, apply to actively growing, young weeds. Difficult weeds (such as perennial or deeply rooted weeds) can often be controlled by tank mixing Reward with other systemic-type herbicides.

## Turfgrass Tolerance to Herbicides

HERBICIDES	TURFGRASSES						
	Kentucky Bluegrass	Bermuda	Bahiagrass	Centipedegrass	Tall Fescue	St. Augustinegrass	Zoysiagrass
<b>Preemergence</b>							
atrazine	S	T(D)	I	T	S	T	I-T
benefin	T	T	T	T	T	T	T
benefin + oryzalin	T	T	T	T	T	T	T
DCPA	T	T	T	T	T	T	T
dithiopyr	T	T	T	T	T	T	T
oryzalin	T	T	T	T	T	T	T
pendimethalin	T	T	T	T	T	T	T
prodiamine	T	T	T	T	T	T	T
<b>Postemergence</b>							
atrazine	S	T(D)	I	T	S	T	I-T
bentazon	T	T	T	T	T	T	T
carfentrazone	T	T	T	T	T	I	T
fenoxaprop	T	S	S	S	T	S	I
foramsulfuron	S	T	S	S	S	I	I
fluroxypyr	T	T	T	T	T	T	T
glyphosate <sup>1</sup>	S	T(D)	S	S	S	S	S
halosulfuron	T	T	T	T	T	T	T
2,4-D + MCPP	T	T	T	I	T	S-I	T
2,4-D + MCPP + dicamba	T	T	T	I	T	I	T
MCPP	T	T	T	I	T	S	T
imazaquin	S	T	S	T	S	T	T
quinclorac	T	T	S	S	T	S	T
sulfosulfuron	T	T	I	T	S	T	T
sulfentrazone	T	T	T	T	I	S	T
trifloxysulfuron	S	T	S	S	S	S	T
sethoxydim	S	S	S	T	S	S	S

T = Tolerant; T(D) = Tolerant only when turfgrass is dormant; S = Sensitive, DO NOT use this herbicide; I = Intermediately tolerant, use herbicide with caution at reduced rates.  
<sup>1</sup>Use glyphosate on dormant bermudagrass, for spot treatments or for edging.

## Weed Control Schedule for Home Lawns

Time of Application	Weeds	Remarks <sup>1</sup>
Late February to mid-March	Crabgrass, goosegrass, sandbur	Apply preemergence herbicide.
April to July	Annual and perennial broadleaf weeds	Apply 2,4-D + MCPP; 2,4-D + MCPP + dicamba; MCPP + 2,4-D + dicamba; or MCPP to actively growing broadleaf weeds.
May to July	Crabgrass, goosegrass, sandbur, dallisgrass, bahiagrass, nutsedge	Apply herbicides to control escaped grass weeds and suppress nutsedge. In centipedegrass, use sethoxydim or sulfosulfuron to control escaped grass weeds. Imazaquin, bentazon, or sulfosulfuron can be used to control emerged nutsedge(s). In bermudagrass and zoysiagrass, these herbicides, foramsulfuron, quinclorac, and trifloxysulfuron may be applied.
Mid-August to mid-October	Annual bluegrass, henbit, chickweed	Apply preemergence herbicide. DO NOT apply to lawns to be overseeded.
November to March	Wild garlic, winter annual broadleaf weeds	Apply 2,4-D + MCPP; 2,4-D + MCPP + dicamba; or MCPP + 2,4-D + dicamba in late November or December when temperatures are above 50 degrees F. Add 0.3 oz surfactant per gallon of spray mix when treating wild garlic. Repeat treatment in February for improved wild garlic control. Imazaquin can be used to control wild garlic. Apply imazaquin only after turfgrass dormancy but before spring green-up.
November to mid-February	Winter annual weeds	Apply atrazine to centipedegrass, St. Augustine-grass and DORMANT bermudagrass for control of annual bluegrass, henbit, hop clovers, etc. DO NOT apply over the root zone of desirable ornamentals.
<sup>1</sup> Refer to the "Turfgrass Weed Control for Homeowners" section in the current homeowner's edition of the <i>Georgia Pest Management Handbook</i> for more information.		

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