

2009 Turfgrass Weed Control For Professionals



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Introduction

This guide supplies information concerning turfgrass herbicides and growth regulators. Because of the risks involved in handling, many herbicides and other pesticides bear the words **Restricted Use** on the label. Only licensed commercial or professional turf and landscape personnel can apply such products. **General Use Pesticides** can be purchased and applied by anyone. However, anyone applying any pesticide for money or to public property (including golf courses and parks) must have a pesticide applicator license from the Arkansas State Plant Board or be supervised by someone with a license. Contact the Plant Board at (501) 225-1598 for more information. They are on the web at www.plantboard.org.

Use herbicides and other pesticides safely to protect against human injury and harm to the environment. Diagnose your weed problem. Select the proper herbicide if one is needed. Follow the label directions. Obey all federal, state and local pesticide laws and regulations. **Read the entire label, not just how much to use. Pesticide labels are federal law, not just a suggestion.**

Recommendations of specific chemicals are based on information on the manufacturer's label and performance in a limited number of trials. It is impossible to test every product under every set of conceivable conditions. Because environmental

conditions and methods of application by users may vary widely, performance of the chemical will not always conform to the safety and pest control standards indicated by experimental data. Bear in mind that herbicide performance will be different every year. Weather guys talk about the 30-year average because that is all we have for long-term predictions. However, there is no average year. It exists only on paper. The biological system is extremely complex, resulting in a huge number of constantly changing variables that will affect the way weeds and herbicides behave. One of the great things about this business is that it is not driven by predictable events but by biology and the environment.

Herbicides are not a substitute for a conscientiously applied cultural program. Cultural practices are at least 60 to 70 percent of turfgrass weed control. The best means of preventing weed encroachment is a dense, vigorously growing turf. By choosing the right grass for the site and following proven fertilization, mowing and irrigation practices, weeds will be less competitive with the turf. Before deciding to use any weed control program, first determine why the turf is thin and why weeds are invading. Correct the factors causing unhealthy turf before implementing a herbicide program. This may sound like IPM, but it is just common sense, a commodity often in short supply.

Control of Specific Weeds

Bahiagrass

Manor or **Blade (metsulfuron)** is a good choice for bahiagrass control in bermudagrass, St. Augustinegrass, centipedegrass and zoysiagrass. Bermudagrass and St. Augustinegrass have more Manor tolerance than centipedegrass and zoysiagrass. In bermudagrass, make two applications of Manor three to four weeks apart at 1 oz/acre. Do not use more than 0.25 oz/acre Manor or Blade on centipedegrass for bahiagrass control. In **MSMA/DSMA** tolerant grasses, repeat applications at seven- to ten-day intervals will suppress bahiagrass. Begin after full green-up in the spring. At least three applications are needed. In centipedegrass, two applications of **Segment** three weeks apart will suppress bahiagrass growth and seedhead development. In zoysiagrass or tall fescue, repeat applications of **Fusilade II** or **Acclaim Extra** may be used. **Monument** (trifloxysulfuron) will provide bahiagrass suppression in bermudagrass or zoysiagrass.

Bermudagrass

While bermudagrass is our most commonly used turfgrass, it is also a difficult-to-control weed in other turfgrasses.

Preplant Control: The most effective way to control bermudagrass is with preplant application of the soil fumigant methyl bromide. If fumigation is not an option, make three applications of glyphosate (3 lb/gal ae) at 3 qt/acre over the growing season (May, July and September). Wait for regrowth before making the follow-up applications. Our research shows that a tank mix of 3 qt glyphosate + 24 fl oz of Fusilade II will improve bermudagrass control over glyphosate alone. When using Fusilade, be aware that it will have some residual soil activity. Wait at least 30 days before replanting seeds.

Bermudagrass Encroachment Into Bentgrass Putting Greens: A big nursery green and a sod cutter or large plugger may be your best friends in the battle against encroachment.

Frequent mechanical edging of the putting green and resodding of infested areas should be part of an encroachment management program. Other approaches include installing a zoysiagrass collar or a mechanical barrier made of plastic or metal. Zoysiagrass will encroach, but it is slower to do so than bermudagrass. Examine the zoysiagrass carefully before installation to be certain it is free of bermudagrass. Avoid using aggressive zoysiagrass cultivars such as 'El Toro' for collars. Tupersan and Prograss are most commonly used to slow bermudagrass encroachment in the collars of bentgrass greens. However, these herbicides will cause varying degrees of bentgrass injury. Tupersan is generally a little safer than Prograss. Applications should be made in the spring and/or fall (April-September) when bentgrass is actively growing and bermudagrass is less active. Suppression is temporary (up to three months) with these treatments. Tank mixes of Cutless with Tupersan or Prograss have sometimes given better results than Tupersan alone. Tupersan 50W is used in spring or fall at 8 oz per 1,000 sq ft. Repeat as needed and water in. With Prograss 1.5EC and Cutless 50W, make the first application in March/April at 3 oz + 0.6 oz per 1,000 sq ft. Repeat in 6 weeks at 1.7 oz + 0.14 oz per 1,000 sq ft. Repeat again in 30 days. Temporary turf discoloration will result.

Bermudagrass – Selective Suppression:

In zoysiagrass use Fusilade II (fluazifop) at 4 fl oz/acre to suppress bermudagrass. Adding Turflon Ester at 1 qt/acre to Fusilade II will improve turfgrass safety and bermudagrass control. Begin around June 1 and repeat every four weeks unless the zoysiagrass has not recovered from the first application. Use only on established zoysiagrass. Zoysiagrass growing in the shade is more susceptible to injury. Do not allow drift onto bentgrass putting greens.

In zoysiagrass or tall fescue, repeat applications of Acclaim Extra (fenoxaprop) at 28 oz/acre at 28- to 35-day intervals during the summer months provide bermudagrass

suppression. Adding Turflon Ester at 1 qt/acre to Fusilade II will improve turfgrass safety and bermudagrass control. Do not tank mix Acclaim Extra with phenoxy herbicides. Do not use on seedling fescues less than four weeks old.

In tall fescue, perennial ryegrass and perennial bluegrass, Turflon Ester at 1 qt/acre will provide bermudagrass suppression. Tank mixing Turflon Ester with Acclaim Extra will result in better bermudagrass control. Repeat applications at three- to four-week intervals will be needed.

In centipedegrass, Segment (sethoxydim) may be used at 1.5 to 2.25 pt/acre to suppress bermudagrass, bahiagrass and other weedy grasses. Do not apply Segment sooner than three weeks after green-up and more than twice per season. Do not tank mix Segment with other pesticides or fertilizers.

Dallisgrass

Dallisgrass is a warm-season perennial with an extensive root system. It may be controlled in **bermudagrass** with repeated applications of MSMA. Five applications of MSMA at five- to seven-day intervals are necessary. Staying on schedule is important. Dallisgrass should be actively growing at the time of application. Apply MSMA at 2.0 lb/acre. In some studies, applying MSMA, waiting two weeks, then spot treating with Revolver (foramsulfuron), followed by a second MSMA application one week later has improved control. Another option is spot treatment with glyphosate. Obviously, this is going to kill some of the desirable grass and leave big, brown spots in the turf. Two applications of glyphosate are needed. Apply the first after active growth begins in May, and spray again when regrowth appears. This will take most of the summer. Use a 1% to 2% (1.33 to 2.33 fl oz of glyphosate/gal of water) spray solution plus 0.5% nonionic surfactant. Keep the glyphosate spray off nontarget plants.

Goosegrass

Ronstar (oxadiazon) is one of the most consistent products for preemergence control of goosegrass. Our research has shown that the first Ronstar application should be made between March 15 and April 1 at 3 lb ai/acre. It is necessary to apply by March 1 if crabgrass is part of the weed population on the site. Combinations such as Ronstar + pendimethalin and Ronstar + Barricade (Regalstar II) are also good choices. Sequential applications of preemergence herbicides are important when trying to control goosegrass. Make the second application 60 days after the first. Postemergence controls include Illoxan 3EC at 1 to 1.4 qt/acre, Sencor (0.19 lb/acre) + MSMA (2.0 lb/acre) and Revolver at 17 to 26 oz/acre. Illoxan and Revolver may be used on bermudagrass greens.

Ground Ivy

This is a tough weed in the mint family usually found growing in the shade in thin stands of turfgrass. Herbicide options include the three-way products containing 2,4-D + MCPP + dicamba. In addition, products containing triclopyr or 2,4-DP have worked well. Confront (triclopyr + clopyralid) is a good choice on approved sites. Confront is not labeled for use in home lawns.

Knotweed

Manor or Blade provides good control. When using three-ways (2,4-D + MCPP + dicamba), repeat applications are usually needed. Other options include triclopyr alone or in combination with clopyralid or 2,4-D. Atrazine, simazine and metribuzin also provide control.

Kyllinga

Monument at 0.56 oz/acre or Certainty at 1.25 oz/acre provides excellent kyllinga control. Two applications of MSMA five to seven days apart at 2.5 lb ai/acre are very effective for kyllinga control in tolerant grasses. SedgeHammer (halosulfuron), while less effective on kyllinga, is safe to use on all turfgrasses.

Lespedeza, Common or Annual

2,4-D alone will not control lespedeza or white clover. Products containing metsulfuron, clopyralid or triclopyr are very effective on most legumes. Spotlight, Confront and Manor/Blade are good lespedeza control products. When using three-ways (2,4-D + MCPP + dicamba), repeat applications are usually needed. Lespedeza is often an indicator of insufficient nitrogen fertilization.

Moss

Silver thread moss (*Bryum argentum*) is the species most commonly found on putting greens. Silver thread moss has been found to be viable after two years of dessication. Mosses are primitive plants with no vascular system (xylem and phloem). They reproduce by spores spread by wind and water movement. Mosses are able to photosynthesize and fix nitrogen and are, therefore, not parasitic. Moss mats tend to develop during the summer in wet, heavily shaded areas following a period of warm, overcast rainy days.

Cultural Control: Control requires a persistent, long-term approach combining cultural and chemical control methods. It is important to realize that only a thick, healthy turf will cure and prevent recurrence of moss. Key objectives are reducing surface moisture and improving air circulation and light exposure. This may require removing adjacent underbrush and selective trees. Improve surface and subsurface drainage and decrease irrigation frequency and amount. Reduce nitrogen at the site. If the moss covers a large area, spiking, verticutting and topdressing will help break up and dry the moss mat. Moss turning orange or golden brown indicates that dessication is occurring. Raising mowing height encourages turf growth and helps reduce the problem.

Quicksilver (carfentrazone) at 2.0 oz per acre in 100 GPA when temperatures are less than 85 degrees F provides excellent moss control. *Poa annua* and bentgrass have excellent tolerance for Quicksilver. Do not apply to desirable hybrid bermudagrass. Does not control algae. Another less effective treatment is Daconil Weather Stik at 4 oz/1,000 sq ft applied every seven days for three

weeks or Daconil Zn at 6 oz/1,000 sq ft applied twice at two-week intervals have been among the most effective chemical treatments. Daconil should be applied at 5 to 10 gallons per 1,000 sq ft and allowed to dry on the leaf surface. Air temperature should be at least 85 degrees F at the time of application. Daconil will not work during cool weather.

Poa annua

Bermudagrass Fairways, Not Overseeded:

One of the cheapest and easiest ways to control *Poa annua* is to use glyphosate at 1 pt/acre while bermudagrass is completely dormant. *Completely* is the key word. **Revolver** (foramsulfuron) at 17.4 fl oz/acre, **TranXit** at 2 oz/acre or **Monument** at 0.56 oz/acre will provide postemergence *Poa annua* control without damaging partially green bermudagrass. **Do not treat areas that drain onto cool-season grasses with Kerb, Monument, Revolver or TranXit.** Avoid tracking spray onto cool-season grasses with equipment or feet. Princep Liquid (simazine) and Aatrex 4L (atrazine) are very effective as late fall or early winter treatments. In areas with heavy leaf fall, it may be necessary to apply before leaves begin to drop. Do not apply atrazine or simazine up slope from desirable cool-season grasses. Sencor is more effective on large *Poa annua* than simazine. Kerb applied at 1.0 to 1.5 lb ai/acre is effective but slow. It will give preemergence and postemergence control.

Bentgrass Putting Greens: Annual bluegrass (*Poa annua*) is the most troublesome winter weed in golf greens. It tolerates low mowing, compaction and thrives in the moist conditions found on putting greens. There is no magic bullet for annual bluegrass control, and it is practically impossible to completely eradicate. That said, there are several options available to help superintendents manage annual bluegrass.

The traditional approach of using preemergence herbicides – **Dimension** (dithiopyr), **Goosegrass/Crabgrass Control** (benefin + oxadiazon) and **Betasan** (bensulide) – has the shortcoming of failing to control the

perennial type, *Poa annua* var. *reptans*. In fact, a preemergence program may encourage the proliferation of perennial biotypes by eliminating the annual type. Research suggests that early spring applications are more effective than fall and that at least four consecutive years of application are needed.

An option that has shown promise is the use of growth regulators such as **Trimmit** (paclobutrazol). This product is used in conversion programs designed to gradually eliminate annual bluegrass. It functions by suppressing annual bluegrass seed-head formation. This approach requires patience, consistency and a management program designed to favor the desirable turfgrass. Two applications of **Trimmit** at 0.25 lb ai/acre in the fall followed by two to three applications in the spring seem to be the best program. Some success has also been reported with other growth regulators including Cutless (flurprimidol) and Embark (mefluidide).

Purple Nutsedge

Monument at 0.56 oz/acre or Certainty at 1.25 oz/acre may be used for purple nutsedge control in bermudagrass and zoysiagrass. Make a repeat application six to eight weeks after the first. Two applications of SedgeHammer 75 DF at the 1.33 oz/acre rate four to six weeks apart provide suppression for most of the growing season. The spot treatment rate for SedgeHammer is 0.9 gram per gallon. SedgeHammer is not labeled for golf greens. SedgeHammer is safe on all turfgrasses.

Image 70 DG (imazaquin) is an effective herbicide for suppressing sedges in turfgrass. It is approved for use on bermudagrass, zoysiagrass, St. Augustinegrass and centipedegrass. The recommended rate is 0.26 oz of product per 1,000 sq ft. This translates to 11.4 oz/acre. The active ingredient rate is 0.5 lb/acre. A repeat application will be needed for full-season suppression. Make the repeat application in four to six weeks or when regrowth appears. A tank mix of 0.5 lb/acre of Image + 2.0 lb/acre MSMA has given better suppression than either product alone. Do not use the MSMA tank mix on St. Augustinegrass or centipedegrass.

Image + MSMA will cause significantly more injury to zoysiagrass than bermudagrass. The coarse-leaved japonica type zoysiagrasses tend to be more herbicide tolerant than the fine-leaved matrella types.

Ryegrass Clumps

Applied to dormant bermudagrass, glyphosate 4L at 16 oz/acre, Revolver at 17.4 oz/acre, TranXit at 2 oz/acre, Manor at 1 oz/acre, Certainty at 1.25 oz/acre and Monument at 0.56 oz/acre all give good to excellent clumpy ryegrass control. All clumpy ryegrass is not the same. Mowing height and perennial age of the clumps are two factors which influence control. Clumps that are mowed at 1/2 inch or less and have not been established for years are easier to manage.

Sandbur

Sandbur (*Cenchrus* spp.) is a prolific seed producer that germinates all summer. Seed are comparatively large and will emerge from greater depths than crabgrass or goosegrass. Sandbur may also behave as a perennial, making the use of a postemergence herbicide such as MSMA essential in sandbur control. Treat when the sandbur is small. Apply a preemergence herbicide such as Surflan (oryzalin), Pendulum (pendimethalin) or Barricade (prodiamine) between March 15 and April 1. A second preemergence application 60 days after the first will be beneficial. Preemergence herbicides should be watered-in immediately after application.

Spurges

Manor or Blade (metsulfuron) at 0.25 oz/acre is the best spurge control treatment. Corsair (chlorsulfuron) is also effective for spurge control. When using three-ways (MCP + dicamba + 2,4-D), repeat applications are usually needed. Sencor and dicamba do a better job on spurges than the three-ways, but they are not as effective as Manor. Preemergence control with dinitroaniline herbicides (Barricade, Pendulum, etc.) is inconsistent. Simazine and atrazine are effective but have a short residual effect in the South. They

are not recommended during the summer months when spurges thrive.

Spurweed or Lawn Burweed

The preferred timing for an application of simazine to control winter annuals such as lawn burweed is some time between Thanksgiving and Christmas. This winter annual is relatively easy to eradicate. Timing is important in controlling this weed. Spraying after the spiny fruits have formed is often emotionally satisfying but is too late to be practical in a biological framework.

Preemergence or postemergence applications of Princep Liquid (simazine) or Aatrex 4L (atrazine) provide excellent spurweed control. Rainfall or irrigation is needed to activate these herbicides. Other winter annuals controlled by this treatment are chickweed, henbit, annual bluegrass, Carolina geranium, parsley piert and corn speedwell. Because atrazine and simazine have some potential for tree and shrub damage, a very safe way to use them is to apply 1 lb/ai/acre of either product in November followed by another 1 lb/ai/acre application in March, if needed. Simazine tends to be less likely to leach through the soil profile than atrazine. If spurweed has already emerged at the time of application, these products will eventually kill it through root uptake.

Sencor (metribuzin) provides excellent postemergence control of spurweed and many other winter annuals. Metribuzin may be applied to dormant or actively growing bermudagrass that is being maintained at mowing heights greater than 1/2 inch. Sencor may cause discoloration on actively growing turf. Do not apply more than twice per season. Rates are from 0.33 to 0.67 lb/acre. Add 0.5% nonionic surfactant. Use only on bermudagrass. Sencor will seriously injure actively growing zoysiagrass. Sencor is not for use on home lawns.

Manor provides excellent postemergence control of spurweed. Repeat applications of three-ways (MCP + dicamba + 2,4-D) are also an option.

Tall Fescue Clumps

Revolver at 26.2 oz/acre, **Certainty** at 1.25 oz/acre, **TranXit** at 2 to 4 oz/acre or **Monument** at 0.56 oz/acre will control tall fescue. Monument and Revolver are for use on bermudagrass and zoysiagrass only. TranXit and Certainty may be used on all warm-season turfgrass. Old clumps that are mowed high are difficult to control.

Violets

Manor or Blade (metsulfuron) is an effective violet control herbicide in bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Products containing triclopyr and clopyralid (Confront, Turflon) or triclopyr and 2,4-D are fairly effective for violet control. Repeat applications are often required. Mid to late fall applications are best followed by mid-spring to early summer. 2,4-D + 2,4-DP will provide partial control. Corsair also does an acceptable job on violets.

Virginia Buttonweed

Virginia buttonweed is a tap-rooted perennial that reproduces from fleshy roots, cut plant pieces and seed. None of the turf herbicides eradicate Virginia buttonweed. If there are only a few plants, dig them up. Remove all plant parts. Fill holes with clean soil and re-sod. The best you can hope for with herbicides is suppression through repeat applications of broadleaf herbicides. Multiple applications of two-way or three-way (2,4-D + MCP + dicamba) herbicides at intervals of three to six weeks do a decent job of suppressing buttonweed. Reapply when you see regrowth. Confront at 1 to 2 pt/acre or Manor (metsulfuron) at 0.5 to 1.0 oz/acre have been fairly effective on Virginia buttonweed. As with other herbicides, repeat applications are necessary. Repeat applications (eight weeks apart) of Monument at 0.56 oz/acre have given season-long suppression of Virginia buttonweed four years out of five in Arkansas research trials.

Wild Garlic (Wild Onion)

Manor or **Blade** is very effective for wild garlic control. Apply in late February or early March on a warm (at least 50 degrees F), sunny day when there is good soil moisture. Manor also controls most of the common winter broadleaf weeds such as henbit, chickweed and parsley piert. Add 0.25% nonionic surfactant. Unlike Image and the 2,4-D related products, Manor does not delay spring transition of partially green bermudagrass. **Corsair** also has good activity on wild garlic.

Image is very effective for wild garlic control. Two applications are required. Make the first application of 8.6 oz/acre (0.2 oz/1,000 sq ft) during November or December and follow it with an 8.6 oz/acre (0.2 oz/1,000 sq ft) application in March. Add 0.25% nonionic surfactant. Apply on a warm (at least 50 degrees F), sunny day when there is good soil moisture. Image also controls some of the common winter annual weeds such as henbit, chickweed and parsley piert.

Another option is use of either **2,4-D LV ester** or one of the various combinations of 2,4-D, MCPP and dicamba (Trimec, Triplet, etc.) available. These products are the least effective and require three applications to eliminate garlic. Make the first treatment in November, repeat in March and then again the following November. Do not treat 2,4-D sensitive grasses such as centipedegrass and St. Augustinegrass unless they are dormant. The ester formulations of 2,4-D are more effective against garlic.

Yellow Nutsedge

Monument at 0.56 oz/acre or **Certainty** at 1.25 oz/acre may be used for yellow nutsedge control in bermudagrass and zoysiagrass. Repeat application, if regrowth appears. Add 0.25% nonionic surfactant.

Basagran T/O (bentazon) may be used for yellow nutsedge control on all turfgrasses grown in Arkansas. Apply at the four- to six-leaf stage of nutsedge growth. Apply when the temperature is at least 75 degrees F. Add crop oil or surfactant to Basagran. Complete coverage is essential. Repeat the application in 7 to 10 days. Product rates for Basagran are 0.75 to 1.5 fl oz/1,000 sq ft or 2 to 5 pt/acre. Do not apply more than 6 pt/acre of Basagran in one season.

SedgeHammer 75 DF (halosulfuron) is an excellent nutsedge herbicide with very good turfgrass safety. It is approved for use on all turfgrasses in Arkansas. It is effective on purple nutsedge, yellow nutsedge and kyllinga. SedgeHammer is a foliar herbicide that should be applied to nutsedge in the three- to eight-leaf stage. The rate is 1.33 oz/acre. Make a second application in four to six weeks or when regrowth appears. Add 0.25% nonionic surfactant. Do not mow for two days before and two days after application. For spot treatment, mix 0.9 gram of SedgeHammer in one gallon of water with 1/3 fl oz nonionic surfactant.

Image 70 DG (imazaquin) is an effective herbicide for suppressing purple or yellow nutsedge in turfgrass. It is approved for use on bermudagrass, zoysiagrass, St. Augustinegrass and centipedegrass. The recommended rate is 0.26 oz of product per 1,000 sq ft. This translates to 11.4 oz/acre. The active ingredient rate is 0.5 lb/acre. A repeat application will probably be needed for full-season suppression. Make the repeat application in four to six weeks or when regrowth appears. A tank mix of Image + 2.0 lb/acre MSMA has given better suppression than either product alone. **Do not use the MSMA tank mix on St. Augustinegrass or centipedegrass. Image + MSMA will cause longer-term injury to zoysiagrass than bermudagrass.** 'Meyer' and 'El Toro' are more tolerant of MSMA than 'Emerald' or 'Matrella' zoysiagrasses.

Turfgrass Renovation				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
Roundup Pro, Touchdown Pro (1 to 5 qt)	glyphosate	most weeds	existing vegetation	Apply to areas that are being renovated before establishment of the desired turfgrass. Apply to actively growing bermudagrass when seedheads appear. Avoid cultivation for 7 days after application. Do not get spray on ornamentals. For bermudagrass control, apply three applications of glyphosate (3 lb/gal ae) at 3 qt/acre over the growing season (May, July and September). Wait for regrowth before making the follow-up applications. Our research shows that a tank mix of 3 qt of glyphosate + 24 fl oz of Fusilade II will improve bermudagrass control over glyphosate alone. When using Fusilade, be aware that it will have some residual soil activity. Wait at least 30 days before replanting seeds.

Turfgrass Border Maintenance				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
Roundup Pro, Touchdown Pro (1 to 5 qt)	glyphosate	existing vegetation	existing vegetation	Use as a spot treatment to prevent turfgrass encroachment in fences, paved areas, walkways and around ornamental plantings. For best results, apply on a sunny day when the temperature is above 60° F and the air is calm. Do not apply to drought-stressed vegetation.
Reward 2S (1 to 2 pt)	diquat (0.5 to 1.0)	existing vegetation	existing vegetation	For spot spray, add 0.3 to 0.75 fl oz per gallon. A nonionic surfactant at 0.25% v/v should be added to the spray mix. Use at least 15 gallons per acre spray volume. Because Reward is not translocated, it will leave a straight line when edging creeping turfgrasses. However, weed control is not as effective as glyphosate.
Finale 1SC (3 to 6 qt)	glufosinate (0.75 to 1.5)	existing vegetation	existing vegetation	Use 1.5 to 4.0 fl oz per gallon of water. The 4 oz rate does the best job. Because Finale has limited translocation, it will leave a straight line when edging creeping turfgrasses. However, weed control is not as effective as glyphosate.
QuickPro (4.5 to 12.25 lb)	glyphosate + diquat (3.4 to 9.3)	existing vegetation	existing vegetation	Amount to add per gallon ranges from 1.2 oz for easy-to-kill annuals to 8.0 oz for low volume brush control. Use 1.5 oz for high volume perennial control. Provides quicker burn than glyphosate alone.

Weed Control Ratings for Preemergence Herbicides

Herbicides	Crabgrass	Goosegrass	Annual Bluegrass	Chickweed, Common	Henbit	Bittercress	Spurweed	Speedwell, Corn	Field Madder	Spurge, Prostrate
atrazine (Aatrex)	F	P	E	E	E	E	E	E		G
benefin (Balan)	G	F	G	G	G	P	P	P	P	P
benefin + oryzalin (XL)	E	G	G	G	G	P			G	F
benefin + trifluralin (Team)	G	F	G	G	G				-	F
bensulide (Bensumec, PreSan)	G	F	F	P	P	P	P		P	-
bensulide + oxadiazon (Goosegrass/Crabgrass)	E	G	G							G
dithiopyr (Dimension)	E	G	G	G	G	G	F	G	P	G
fenamifol (Rubigan)	P	P	G	P	P	P	P	P	P	P
isoxaben (Gallery)	P	P	P	E	E	E	E	G	F	G
metolachlor (Pennant)	F	P	G	F						P
oryzalin (Surflan)	E	G	E	G	G	P	F	P	G	F
oxadiazon (Ronstar)	G	E	G	P	P	P	P	G	P	P
pendimethalin (Pendulum)	E	G	G	G	G	G	F	F	P	G
proflumicid (Barricade)	E	G	G	G	G	G	G	G	P	G
pronamide (Kerb)	P	P	E	E	F		P	E		P
rimsulfuron (TranXit)	P	P	G	P	P	P	P	P	P	P
simazine (Princep)	F	P	E	E	E	E	E	E	F	F

E = Excellent, G = Good, F = Fair, P = Poor, Blank = No data

Turfgrass Tolerance of Preemergence Herbicides

Herbicide	Bermudagrass	Centipedegrass	St. Augustinegrass	Tall Fescue	Zoysiagrass
atrazine (Aatrex)	S	S	S	NR	I-S
benefin (Balan)	S	S	S	S	S
benefin + oryzalin (XL)	S	S	S	S	S
benefin + trifluralin (Team)	S	S	S	S	S
bensulide (PreSan)	S	S	S	S	S
dithiopyr (Dimension)	S	S	S	S	S
isoxaben (Gallery)	S	S	S	S	S
metolachlor (Pennant)	S	S	S	S	S
oryzalin (Surflan)	S	S	S	S	S
oxadiazon (Ronstar)	S	NR	S	S	S
pendimethalin (Pre-M)	S	S	S	S	S
proflumicid (Barricade)	S	S	S	S	S
pronamide (Kerb)	S	S	S	S	S
rimsulfuron (TranXit)	S	NR	NR	NR	NR
simazine (Princep)	I	S	S	NR	S
Goosegrass/Crabgrass	S	NR	NR	NR	S

S = Safe at labeled rates on healthy, mature turf. I = Intermediate safety, may cause minor damage to mature, healthy turf. Consider using the lower end of the rate range. Do not apply to turf under stress. NR = Not registered for use on this species.

Preemergence Herbicides

(Refer to herbicide label for specific turfgrass species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
AAtrex 4L, others (1 qt)	atrazine (1.0)	same as for benefin plus henbit, chickweed, spurweed	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Apply between November 15 and December 31 for winter weed control. For bermudagrass and zoysiagrass, atrazine should be applied only to dormant turf. Do not apply to areas that drain onto tees, greens and other desirable turfgrasses. Avoid application during spring green-up. Do not apply within the root zone of azaleas, camellias, boxwoods and other shallow-rooted species. Do not apply more than 1.0 lb/ai/A to hybrid bermudagrass.
Balan 2.5G (120 lb)	benefin (3.0)	summer annual grasses, annual bluegrass, some small seeded broadleaves	established bahiagrass, bermudagrass, centipedegrass, Kentucky bluegrass, red fescue, St. Augustinegrass, tall fescue, zoysiagrass	An additional application may be made 8 weeks after the initial treatment for continued weed control. Do not apply to newly sprigged grasses until these turfs are well established. Do not use on golf course greens or make a spring application to fall-planted turfgrasses.
Barricade 65 WDG (1.15 lb)	prodiamine (0.75)	same as above plus chickweed, spurge, goosegrass	same as above	Apply only to well-established turf. Do not apply to tees or greens. Do not exceed a maximum of 2.3 lb/A per year for bermudagrass, centipedegrass, tall fescue and zoysiagrass. Do not exceed 1.5 lb/A per year for St. Augustinegrass. Do not make more than two applications per calendar year, and allow at least 60 days between treatments. Use a split application for goosegrass control. Wait 4 to 6 months per 0.75 lb of Barricade applied before reseeding.
Bensumec 4 LF (1.9 to 3.2 gal)	bensulide (7.5 to 12.5)	same as above	same as above	Apply high rate in fall for annual bluegrass control. Apply a light irrigation immediately after treatment. Do not apply to newly sprigged grasses. Delay reseeding for 4 months after treatment. May be used on bermudagrass and bentgrass greens.
Dimension 40 WSP (1.25 lb)	dithiopyr (0.5)	same as for benefin plus oxalis	same as above	Has postemergence activity on very small crabgrass. Do not reseed, overseed or sprig within 3 months of application. See label for specific programs related to mowing height, timing and split applications.
Gallery 75 DF (1 to 2 lb)	isoxaben (0.5 to 1.0)	broadleaves such as chickweed, henbit, spurge, plantain, others	same as above	Controls a wide range of annual broadleaf weeds. Tank mix with a grass herbicide such as Barricade, Pendulum, etc., to broaden the spectrum of control. Not for greens or tees. Do not apply to newly seeded turf until it has been mowed three times. Do not reseed or overseed within 60 days of application.

Preemergence Herbicides

(Refer to herbicide label for specific turfgrass species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
Goosegrass/ Crabgrass Control (115 lb)	bensulide (6.0) + oxadiazon (1.5)	summer annual grasses and goosegrass	bermudagrass, buffalograss, Kentucky bluegrass, seashore paspalum, St. Augustinegrass, tall fescue, zoysiagrass	Apply a light irrigation after treatment. Do not use on newly sprigged grasses until well established. Delay reseeding for 5 months after treatment. See label for precautions concerning use on putting greens.
Kerb T&O 50 WSP (2 lb)	pronamide (1.0)	annual bluegrass	all warm-season grasses	Preemergence and postemergence control. Apply from September 15 to February 1. Increase rate as annual bluegrass approaches maturity. Kerb works slowly (3 to 5 weeks). Do not apply to cool-season grasses. A light rain or irrigation is needed to activate Kerb if no rain falls within 24 to 48 hours of application. Kerb is a restricted use herbicide. Do not apply a wetting agent for 14 days before or after making an application of Kerb to greens.
Pendulum 60DF, Pendulum Aquacap (see label)	pendimethalin (1.5 to 3.0)	same as for benefin plus goosegrass, oxalis and speedwell	same as for benefin	Do not use on newly sprigged turfgrasses. Not recommended for turfgrass that has been severely thinned due to winter stress. Do not reseed within 4 months of application. Use the low rate for tall fescue and Kentucky bluegrass. The high rate may be used on warm-season grasses.
Princep Liquid 4L, others (1 qt)	simazine (1.0)	same as for benefin plus henbit, chickweed, spurweed	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Apply between November 15 and December 31 for winter weed control. For bermudagrass and zoysiagrass, atrazine should be applied only to dormant turf. Do not apply to areas that drain onto tees, greens and other desirable turfgrasses. Avoid application during spring green-up. Do not apply within the root zone of azaleas, camellias, boxwoods and other shallow-rooted species. Do not apply more than 1.0 lb/ai/A to hybrid bermudagrass.
Regalstar II, Regalstar G (200 lb)	oxadiazon + prodiamine (2.0 + 0.4)	crabgrass, goosegrass	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Controls annual grasses. Regalstar II is formulated on a 38-0-0 ureaform nitrogen carrier. Regalstar G does not contain fertilizer. Apply to dry foliage. Delay applications to newly sprigged bermudagrass until after stolons have rooted and the grass has filled in. DO NOT apply to putting greens.

Preemergence Herbicides

(Refer to herbicide label for specific turfgrass species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
Ronstar 2 G (100 to 150 lb) Ronstar 50 WP (4 to 6 lb) Ronstar Flo (2.5 to 3.8 qt)	oxadiazon (2.0 to 3.0)	same as for benefin especially for goosegrass	bermudagrass, buffalograss, Kentucky bluegrass, seashore paspalum, St. Augustinegrass, tall fescue, zoysiagrass	May cause temporary discoloration of bermudagrass, which is normally outgrown in 2 to 3 weeks. Do not apply to wet turf. Delay reseeding for 4 months after treatment. Do not apply to golf course greens. Ronstar 50W is not labeled on tall fescue. Ronstar 50W or 2G may be used at 2.0 to 3.0 lb/ai/A immediately before or immediately after sprigging bermudagrass.
Rubigan 1AS (see comments)	fenamirol (see comments)	annual bluegrass	overseeded bermudagrass	Rubigan is a systemic fungicide that reduces the infestation level of annual bluegrass. May be applied as a sequential treatment to bermudagrass greens that are overseeded with perennial ryegrass, <i>Poa trivialis</i> or bentgrass. Use the triple application program if <i>Poa trivialis</i> or bentgrass is used for overseeding. For double applications, apply 6.0 fl oz of Rubigan AS per 1,000 sq ft with the last application 2 weeks before overseeding with ryegrass. For triple applications, apply 4 fl oz of Rubigan AS per 1,000 sq ft with the last application 2 weeks before overseeding with ryegrass or 4 weeks before overseeding with <i>Poa trivialis</i> or bentgrass. A single application of Rubigan AS at 2.0 fl oz in January or February will help maintain annual bluegrass control.
Surflan 4 AS (1.5 qt)	oryzalin (1.5)	same as for benefin plus goosegrass	bermudagrass, buffalograss, Kentucky bluegrass, St. Augustinegrass, tall fescue, zoysiagrass	Apply 2.0 to 3.0 qt/A for summer annual grass control, or apply 1.5 qt/A and apply an additional 1.5 qt/A 8 to 10 weeks after the initial application. Split applications are recommended for improved goosegrass control and for tall fescue. Do not apply to newly sprigged grasses until well established. Do not make a spring application to fall-planted turfgrasses. Delay reseeding for 3 to 4 months after application.
Team Pro 0.86G (174 to 349 lb)	benefin (2.0) + trifluralin (1.0)	same as for benefin	bermudagrass, centipedegrass, St. Augustinegrass, tall fescue, zoysiagrass	Do not apply to newly sprigged grasses until well established. Do not apply to putting greens. Do not make a spring application to fall-planted turfgrasses. Delay reseeding for 6 weeks (low rate) and for 12 to 16 weeks (high rate) after application.
XL 2 G (150 lb)	benefin (1.5) + oryzalin (1.5)	same as for benefin plus goosegrass	bermudagrass, centipedegrass, St. Augustinegrass, tall fescue, zoysiagrass	Do not apply to newly sprigged grasses until well established. Do not apply to golf course greens. Do not make a spring application to fall-planted turfgrasses. Delay reseeding for 6 weeks (low rate) and for 12 to 16 weeks (high rate) after application.

Weed Control Ratings for Postemergence Broadleaf Herbicides

Herbicides	Buttonweed, Virginia	Catsear, Dandelion	Chickweed, Common	Chickweed, Mouse-ear	Clover, White	Dandelion	Dichondra	Garlic, Wild (Onion)	Henbit	Ivy, Ground	Knotweed, Prostrate	Lespedeza	Madder, Field	Parsley Piert	Pennywort	Plantain	Speedwell, Corn	Spurge, Prostate	Spurweed (Burweed)	Strawberry, India Mock	Violet	Woodsorrel
2,4-D	F	F	P	P	P	E	G	G	P	P	P	P	P	P	F	G	P	P	F	F	P	P
MCPP (Mecomec)	P	F	F	F	E	E	F	F	F	F	P		P	G	F		P	F	F		F	P
2,4-D + MCPP	F	F	G	G	F	E	G	G	E	G	F	G		E	G	E	F	F	G		G	P
2,4-D + 2,4-DP	F	F	E	G	F	E	G	G	E	G	F	G		E	G	E	F	F	G		G	P
2,4-D + triclopyr	F	F	E	E	G	E	G	G	E	G	F	E	P	E	G	E	G	F	E		G	G
2,4-D + MCPP + dicamba	F	F	E	E	E	E	G	G	E	G	F	G		E	G	E	F	F	E	E	G	P
triclopyr + clopyralid (Confront)	G		E	E	E	E	E	G	E	G	F	E	P	E	E	E	E	G	E	G	G	G
atrazine (AAtrex)	P		E	E	G	P	G	P	E			G	F	E	E	P	G	G	E			
bentazon (Basagran)	P								P						G				E			P
chlorsulfuron (Corsair, TFC)	F																	G			G	
clopyralid (Lontrel)	F				E	F						P										
dicamba (Banvel)	F	G		E				G	E	G	G			E		P		G				
fluroxypr (Spotlight)	G		G		G	G			E	G		E				F						
glyphosate	F								F													
imazaquin (Image)			G	G	G			E	G													
metribuzin (Sencor)			E	E					E			F	F	E			E	G	E			
metsulfuron (Manor)	F	G	E	E	E	E	G	E	E		E	E	P		G	E	E	E	E		E	G
quinclorac (Drive)					E	E	E									G						
simazine (Princep)	F	P	E	E	G		F		E			F	F	E	G			F	G			
sulfentrazone (Dismiss)			G		G	G			G	F	G	P		G		G	G	E	G	G	F	G
sulfosulfuron (Certainty)			G		G				G													
trifloxysulfuron (Monument)	G				G	G	G		G							P		P			P	P

E = Excellent, **G** = Good, **F** = Fair, **P** = Poor, **Blank** = No data

Weed Control Ratings for Postemergence Grass Herbicides									
Herbicides	Crabgrass	Goosegrass	Annual Bluegrass	Sandbur	Dallisgrass	Ryegrass	Bahiagrass	Tall Fescue	Bermudagrass
atrazine (AAtrex)	P	P	E	F	P	G		F	
chlorsulfuron (Corsair, TFC)								G	
clethodim (Envoy)	E	G	G			G			G
diclofop (Illoxan)	P	E	P	P	P	G	P	P	P
ethofumesate (Prograss)	P	P	G	P	P	P	P	P	P
fenoxaprop (Acclaim Extra)	G	G	P	G	P	P	G	P	P
fluazifop (Fusilade II)	G	G	F	G	P	F	G	P	G
foramsulfuron (Revolver)		G	G		G	G		G	P
glyphosate ¹	E	E	E	E	G	E	G	E	G
mesotrione (Tenacity)	G	F	P	P	P	P	P	P	P
metribuzin (Sencor)	F	G	G		F	G	P	P	P
metsulfuron (Manor)	P	P	P	P	P	G	G	P	P
MSMA	E	F	P	G	F	P	F	P	P
pronamide (Kerb)	P	P	G	P	P	G	P	P	P
quinclorac (Drive)	F	P	P	P	P	P	P	P	P
glyphosate + Fusilade ²									G
rimsulfuron (TranXit)	P	P	G			G			P
Sencor + MSMA	E	E		G	F				
sethoxydim (Segment)	G	G	F	G	P	P	G	P	G
simazine (Princep)	F	P	G	F	P	G	P	P	P
sulfosulfuron (Certainty)	P	P	G			G		G	P
trifloxysulfuron (Monument)	P	P	G		F	E	F	G	
E = Excellent, G = Good, F = Fair, P = Poor, Blank = No data									
¹ Use only in completely dormant bermudagrass or as a preplant application.									
² Use as a preplant application. Do not reseed for 30 days after applying Fusilade.									

Turfgrass Tolerance of Postemergence Herbicides					
Herbicide	Bermudagrass	Centipedegrass	St. Augustinegrass	Tall Fescue	Zoysiagrass
2,4-D	S	I	I	S	S
2,4-D + dicamba	S	I	I	S	S
2,4-D + dichlorprop (2,4-DP)	S	I	I	S	S
2,4-D + mecoprop	S	I	I	S	S
2,4-D + mecoprop + dichlorprop	S	I	I	S	S
2,4-D + mecoprop + dicamba	S	I	I	S	S
atrazine (AAtrex)	S-I	S-I	S-I	NR	S-I
bentazon (Basagran)	S	S	S	S	S
bromoxynil (Buctril)	S	S	S	S	S
carfentrazone (Quicksilver)	S	S	S	S	S
chlorsulfuron (Corsair)	S	NR	NR	NR	NR
clethodim (Envoy)	NR	S-I	NR	NR	NR
clopyralid (Lontrel)	S	S	S	S	S
dicamba (Banvel)	S	I	I	S	S
diclofop (Illoxan)	S	NR	NR	NR	NR
fenoxaprop (Acclaim Extra)	NR	NR	NR	S	S
fluazifop-p (Fusilade II)	NR	NR	NR	S-I	S-I
fluroxypr (Spotlight)	S	S	S	S	S
foramsulfuron (Revolver)	S	NR	NR	NR	S
imazaquin (Image)	I	NR	S	NR	S
mecoprop (MCP)	S	I	I	S	S
mesotrione (Tenacity)	NR	S	I-S	S	NR
metribuzin (Sencor)	S-I	NR	NR	NR	NR
metsulfuron (Manor)	S	S-I	S	NR	S-I
MSMA, DSMA	S	NR	NR	I	I
pronamide (Kerb)	S	NR	NR	NR	NR
rimsulfuron (TranXit)	S	S	S	NR	S
sethoxydim (Segment)	NR	S	NR	NR	NR
sulfosulfuron (Certainty)	S	S	S	NR	S
sulfentrazone (Dismiss)	S	S	NR	I	S
triclopyr + clopyralid (Confront)	I	NR	NR	S	I
trifloxysulfuron (Monument)	S	NR	NR	NR	S

S = Safe at labeled rates.
I = Intermediate safety, use at reduced rates.
NR = Not registered for use on this turfgrass; do not use.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
2,4-D	2,4-D (1.0)	many broadleaf weeds including dandelion; 2,4-D alone will not control white clover, henbit, chickweed	bermudagrass, centipedegrass, tall fescue, zoysiagrass	Amine formulations of 2,4-D are nonvolatile and are safer than ester formulations for use near ornamental trees and shrubs. Apply to small and actively growing broadleaf weeds as a summer or winter treatment. Do not apply 2,4-D to St. Augustinegrass. 'Tifgreen' and 'Tifdwarf' bermudagrass are more sensitive; use reduced rates on these varieties. Do not allow spray to drift to contact the foliage of ornamentals. For hard-to-control perennials, combination products will improve control. Use one-half rate on centipedegrass.
2 Plus 2 (2.5 qt)	2,4-D + mecoprop (1.2 + 1.1)	broadleaf weeds	Kentucky bluegrass, bermudagrass, tall fescue	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT apply to St. Augustinegrass or centipedegrass.
AAtrex 4L, others (1 qt)	atrazine (1.0 to 2.0)	annual bluegrass, broadleaf winter annuals	centipedegrass, St. Augustinegrass, zoysiagrass	Apply between November 15 and December 31 for winter weed control. For spurweed, apply in December or January. For bermudagrass and zoysiagrass, atrazine should be applied only to dormant turf. Do not apply to areas that drain onto tees, greens and other desirable turfgrasses. Do not apply more than 1 lb/acre on hybrid bermudagrasses. Avoid application during spring green-up. Do not apply within the root zone of azaleas, camellias, boxwoods and other shallow-rooted species. AAtrex is a restricted use herbicide.
Acclaim Extra 0.57 EC (13 to 39 oz)	fenoxaprop (0.19 to 0.34)	annual weedy grasses, bermudagrass suppression	perennial ryegrass, tall fescue, zoysiagrass	Rate depends on growth stage of weedy grasses. Check label. A second application may be applied 2 weeks after the first. Do not use on bentgrass putting greens. Use the 28 oz/A rate for bermudagrass suppression. Apply every 28 to 35 days. Use a hooded sprayer, a sheet of plywood, cardboard or similar material as a shield to prevent drift when working near sensitive grasses. For bermudagrass suppression in tall fescue , adding Turflon Ester will improve control.
Basagran T/O (2 to 4 pt)	bentazon (1.0 to 2.0)	yellow nutsedge, globe sedge, annual sedge and many broadleaf annual weeds	tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Apply bentazon to emerged yellow nutsedge that is actively growing under good soil moisture conditions. Apply 2 to 3 pt/A and follow 10 to 14 days later with an additional application, if necessary. Thorough spray coverage is essential for acceptable control. Spot spraying may result in turf injury. Do not mow 3 to 5 days before or after application. Does not control purple nutsedge.
Buctril 2L (1 to 2 pt)	bromoxynil (0.38 to 0.5)	very small broadleaf weeds	bermudagrass, bentgrass, ryegrass	Safe on seedling or sprigged turf. Contact herbicide. Control is poor after weeds exceed the 4- to 6-leaf stage.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Certainty (0.75 to 1.25 oz)	sulfosulfuron (0.035 to 0.094)	annual bluegrass, sedges, ryegrass, tall fescue, johnsongrass	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Add 0.25% nonionic surfactant. May be used on commercial and residential turf. Do not apply within 4 feet of golf greens. Add 0.1 oz per 10 gallons of water for spot treatment.
Chaser (2 to 4 pt)	2,4-D + triclopyr (0.5 + 0.25 to 1.0 + 0.5)	broadleaf weeds	Kentucky bluegrass, tall fescue	Controls a broader spectrum of weeds than 2,4-D alone. NOT RECOMMENDED for warm-season grasses. Apply in spring or fall months when weeds are actively growing. Newly seeded turf should be mowed three times before application. DO NOT reseed until 3 weeks after application. Repeat applications are recommended for corn speedwell, ground ivy, wood-sorrel, parsley piert and wild violet(s).
Confront 3L (1 to 2 pt)	clopyralid + triclopyr (0.09 to 0.19 + 0.28 to 0.56)	broadleaf weeds, good on legumes, plantain, ragweed, clover, vetch	bermudagrass, zoysiagrass, tall fescue, ryegrass	Contains no 2,4-D. Use high rates only on cool-season grasses. Expect some yellowing on warm-season grasses. Use on grasses mowed at 0.5 inch or greater. Do not use on residential turfgrass.
Cool Power, HorsePower (see label)	MCPA + triclopyr + dicamba (see label)	broadleaf weeds	Kentucky bluegrass, tall fescue, bermudagrass, zoysiagrass	Controls a broader spectrum of weeds than 2,4-D alone. Cool Power is an ester formulation of MCPA + triclopyr + dicamba primarily for use during the cool winter months. HorsePower contains amine formulations of these herbicides. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after three to four mowings. Delay reseeding for 3 to 4 weeks after application. Avoid applications during the spring transition of warm-season turfgrasses.
Corsair 75 DF (1 to 5.33 oz)	chlorsulfuron (0.046 to 0.25)	broadleaves, wild garlic, tall fescue, perennial ryegrass	bermudagrass	Use the high rate for tall fescue control. Very slow acting. Add 0.25% nonionic surfactant. Controls prostrate spurge. Wild violet, Virginia buttonweed and wild garlic are listed on the label.
Dismiss 4L (1/4 to 3/4 pt)	sulfentrazone (0.125 to 0.375)	dandelion, henbit, clovers, chickweed, sparges, speedwells, wild garlic, annual sedges, purple and yellow nutsedge and kyllingas	bermudagrass, centipedegrass, Kentucky bluegrass, ryegrass, tall fescue, zoysiagrass	Maximum use rate on bentgrass, perennial ryegrass and tall fescue is 4 fl oz/acre. Weed control spectrum increases when tank-mixed with 2,4-D and dicamba. Do not apply to golf course tees or greens. Do not apply directly to landscape ornamentals or to ornamental beds. Do not apply with surfactants unless compatibility tests have previously demonstrated compatibility and safety on grass type. Reseeding, overseeding and sprigging can be performed three months after application due to product inhibiting establishment. Overseeding with ryegrass should to be delayed 4 to 6 weeks after application but only if slight injury can be tolerated. Do not use on newly seeded turfgrasses until they have been mowed at least twice. Recommended that sod be established for at least 6 weeks before application and not within 3 months of harvest.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Drive 75 DF (1 lb) Drive XLR8 (2 qt)	quinclorac (0.75)	crabgrass, signalgrass, barnyardgrass, foxtail, white clover, dandelion	annual bluegrass, ryegrass, bermudagrass, Kentucky bluegrass, tall fescue, zoysiagrass	Not labeled for golf greens or collars. Add crop oil concentrate (2 pt/A) or methylated seed oil (1.5 pt) to increase performance. Make two applications 3 weeks apart for perennial weeds.
Escalade (1 qt)	2,4-D + dicamba + fluroxypyr (0.8 + 0.4 + 0.1)	controls many broadleaf weeds	bermudagrass, tall fescue, zoysiagrass	Do not use on greens or tees.
Finale 1SC (3 to 6 qt)	glufosinate (0.75 to 1.5)	controls many winter annual broadleaf weeds and annual bluegrass	completely dormant bermudagrass	Do not apply during spring green-up.
Fusilade II 2 EC (4 fl oz)	fluazifop (0.06)	bermudagrass suppression	use only on established zoysiagrass or tall fescue	Start treatments for bermudagrass suppression in zoysiagrass around June 1 when zoysiagrass is growing well. Repeat every 30 days unless zoysiagrass has not adequately recovered from the previous application. Zoysiagrass growing in shade is more readily injured. Use 5 to 6 fl oz/A for tall fescue. Make first fescue application in the spring when bermudagrass is breaking dormancy and the second in the fall. Tall fescue will be temporarily discolored. Do not apply or allow drift onto bentgrass putting greens. Use a hooded sprayer, a sheet of plywood or cardboard or similar material as a shield to prevent drift when working near sensitive grasses.
Illoxan 3 EC (32 to 43 oz)	diclofop (0.75 to 1.0)	goosegrass, ryegrass	bermudagrass	Apply to established, actively growing bermudagrass. Illoxan tends to perform better on closely mowed goosegrass (0.75 inch or less). Young goosegrass plants are easier to control. Use the higher rate on older plants. Will not adequately control large, mature goosegrass. See label for specific rates. For use only on golf courses. Do not mow for 24 to 36 hours after application. Control takes two to three weeks. Tank mixing may reduce control. Do not overseed for six weeks following application.
Image 70 DG (11.4 oz)	imazaquin (0.5)	purple nutsedge, kyllinga, wild garlic, some broadleaves	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Add a nonionic surfactant (1 qt/100 gal). The addition of MSMA @ 2 lb/ai/A (bermudagrass only) will aid in control of nutsedge(s) and escaped weedy grasses. Do not apply when turfgrass is emerging from winter dormancy. Image will severely injure fescues and ryegrasses. Do not apply to newly planted or sprigged lawns or golf greens. Multiple applications of imazaquin at high rates will inhibit turfgrass growth.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Kerb 50W (2 to 3 lb)	pronamide (1.0 to 1.5)	annual bluegrass, ryegrass clumps	bermudagrass	Use only on bermudagrass. Controls annual bluegrass and clumpy ryegrass. Do not apply to a slope that drains onto cool-season grasses. If applied in spring, 3 to 4 weeks are needed for control. Requires 6 weeks for clumpy ryegrass control if mowed at fairway height. Late fall or early winter applications are more effective on annual bluegrass. If used for spring ryegrass transition, do not apply before May 1 or before 75% bermudagrass green-up because ryegrass will disappear quickly. TranXit, Revolver and Monument are the quickest to show activity. Do apply before May 1 for ryegrass transition.
Lontrel 3L (0.25 to 1.33 pt)	clopyralid (0.19 to 0.5)	legumes and composite family weeds	bermudagrass, centipedegrass, St. Augustinegrass, tall fescue, zoysiagrass	Do not use on home lawns. Excellent legume control including kudzu, vetch, clovers and lespedeza. Avoid contact with any leguminous landscape plants including honey locust, mimosa, little leaf linden and redbud. Centipedegrass and St. Augustinegrass have greater tolerance for Lontrel compared to other growth regulator herbicides (2,4-D, etc.). Do not use treated clippings for mulch.
Manor/Blade 60 DF (0.25 to 1 oz)	metsulfuron (0.01 to 0.04)	same as above	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass, Kentucky bluegrass	Controls a wide range of broadleaf weeds, 'Pensacola' bahiagrass and wild garlic/onion. May also be used to hasten the spring transition of bermudagrass overseeded with perennial ryegrass to bermudagrass. Add a nonionic surfactant at 0.25% v/v. DO NOT exceed 0.5 oz on centipedegrass or Kentucky bluegrass. DO NOT overseed for 8 weeks after application or plant woody ornamentals in treated areas for one year after application. Not recommended for use on tall fescue.
Mecomec (2 to 2.75 pt)	MCPP (1.25 to 1.88)	annual broadleaf weeds	bentgrass	Do not apply to St. Augustinegrass or centipedegrass. Do not water for 24 hours after application.
Millenium Ultra (2 to 3 pt)	2,4-D + clopyralid + dicamba (see label)	broadleaf weeds	Kentucky bluegrass, tall fescue, bermudagrass, zoysiagrass	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after three to four mowings. Delay reseeding for 3 to 4 weeks after application. DO NOT spray when air temperatures are > 90° F. Not recommended for use on centipedegrass and St. Augustinegrass. Avoid applications during the spring transition of warm-season turfgrasses. Not labeled for use on residential turfgrasses.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Monument 75 DF (0.28 to 0.56 oz)	trifloxysulfuron (0.015 to 0.026)	broadleaf weeds	bermudagrass, zoysiagrass	Apply Monument for control of undesirable cool-season grasses such as annual bluegrass, ryegrass and tall fescue. Monument may be used for spring transition of bermudagrass overseeded with cool-season turfgrasses the previous fall. Wait six weeks before seeding treated areas with cool-season grasses. Monument is rainfast within three hours of application. Do not use on residential turfgrasses.
MSMA (6 lb/gal) DSMA (6.6 lb/gal) (see label)	MSMA, DSMA (2.0)	crabgrass, bahia grass, nutsedge, dallisgrass, sandbur, signalgrass, sprangletop, broadleaf annual weeds	bermudagrass, zoysiagrass, tall fescue	Temporary discoloration of turf will occur. On new stands of fescue, apply one-half rate after three mowings. Begin treatment when weedy grasses are in the three- to four-leaf stage. Use two applications 7 days apart. Nutsedge and sandbur may require three to four applications. May be applied to newly sprigged bermudagrass. Do not apply to centipedegrass or St. Augustinegrass.
Onetime (2 qt)	quinclorac + mecoprop + dicamba (0.75 + 0.38 + 0.1)	crabgrass and several broadleaf weeds	bermudagrass, zoysiagrass, tall fescue	Not labeled for golf greens or collars. Add crop oil concentrate (2 pt/A) or methylated seed oil (1.5 pt) to increase performance. Make two applications three weeks apart for perennial weeds.
Power Zone (2 to 6 pt)	carfentrazone (0.04 lb/gal) + MCPA (2.21 lb/gal) + MCP (0.44 lb/gal) + dicamba (0.22 lb/gal)	many broadleaf weeds	bermudagrass, centipedegrass, tall fescue, zoysiagrass, ryegrass	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly established cool-season turfgrasses or 4 weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until two weeks after application. DO NOT apply at air temperatures > 90° F.
Princep 4L (1 qt)	simazine (1.0)	annual bluegrass, most winter annual broadleaf weeds	bermudagrass	Apply between November 15 and December 31 for winter weed control. For bermudagrass and zoysiagrass, atrazine should be applied only to dormant turf. Do not apply to areas that drain onto tees, greens and other desirable turfgrasses. Avoid application during spring green-up. Do not apply within the root zone of azaleas, camellias, boxwoods and other shallow-rooted species.
Prograss 1.5 EC (2 gal)	ethofumesate (3.0)	bermudagrass	St. Augustinegrass	Make the first application in mid-March and the second 30 days later. Tank mix with atrazine at 2 lb per acre. Temporary St. Augustinegrass stunting may occur. Do not overlap.
Prompt 5L (1.6 to 2.4 pt)	bentazon + atrazine (0.5 to 0.75)	many broadleaf weeds, some annual sedges	centipedegrass, St. Augustinegrass, zoysiagrass	Use on St. Augustinegrass, zoysiagrass and centipedegrass only. Apply no earlier than 10 days after sprigging. Use the high rate on yellow nutsedge and follow with a second application 7 to 10 days later. Hard to find a supplier.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Q4 (7 to 8 pt)	sulfentrazone (0.06 lb/gal) + 2,4-D (0.88 lb/gal) + MCPP (0.5 lb/gal) + dicamba (0.1 lb/gal) + quinclorac (0.5 lb/gal)	broadleaf weeds and some grasses	Kentucky bluegrass, fescues, ryegrass	Do not use on warm-season turfgrasses or creeping bentgrass. Do not apply to greens, tees or collars.
Revolver 0.19 EC (8.8 to 26.2 fl oz)	foramsulfuron (0.01 to 0.04)	annual bluegrass, goosegrass, ryegrass, tall fescue, partial dallisgrass control	bermudagrass, zoysiagrass	Apply Revolver for: a) control of undesirable cool-season grasses (including tall fescue), b) control of emerged annual bluegrass two weeks before overseeding bermudagrass with perennial ryegrass, c) postemergence control of goosegrass in late spring and early summer and d) spring transition of bermudagrass overseeded the previous fall with cool-season turfgrasses. DO NOT apply Revolver within two weeks of sprigging. Revolver is rainfast within two hours of application. Revolver is not labeled for use on residential turfgrasses.
Reward 2S (1 to 2 pt)	diquat (0.5 to 1.0)	winter annual broadleaf weeds such as little barley, annual bluegrass, henbit and Carolina geranium	dormant bermudagrass	Use on lawns, parks and golf courses. A nonionic surfactant at 0.25% v/v should be added to the spray mix. Apply only to dormant bermudagrass. Add 0.25% nonionic surfactant to Reward.
Roundup 4L (1 pt)	glyphosate (0.5)	annual bluegrass, winter broadleaf weeds	dormant bermudagrass	Apply only to completely dormant bermudagrass with no green stolons or leaves visible. In Arkansas, mid to late January is usually the best time to apply. Apply at 10 to 20 gpa.
SedgeHammer 75DF (1.33 oz)	halosulfuron (0.062)	most nutsedges and kyllinga species	all turfgrasses	Apply to 3- to 8-leaf nutsedge. Use 0.5% nonionic surfactant. Two applications may be made. Do not exceed 0.125 lb/ai/A in a single season. Not labeled for putting greens. For spot treatment, mix 0.9 gram of SedgeHammer in 1 gal of water with 1/3 oz surfactant. Do not mow for two days before and after application.
Sencor 75 Turf (0.33 to 0.66 lb)	metribuzin (0.25 to 0.5)	goosegrass, broadleaf annual weeds	bermudagrass	Use low rate on actively growing bermudagrass. Use high rate on dormant bermudagrass for winter annual weed control. Do not apply in the root zone of shallow-rooted ornamentals. Do not apply to tees, greens or other turf mowed at less than 1/2 inch.
Surge (2.75 to 4.0 pt)	sulfentrazone (0.06 lb/gal) + 2,4-D (1.4 lb/gal) + MCPP (0.5 lb/gal) + dicamba (0.22 lb/gal)	broadleaf weeds including spotted spurge	bermudagrass, Kentucky bluegrass, tall fescue, zoysiagrass	Do not apply at air temperatures greater than 90° F or during spring transition. Provides some nutsedge suppression.

Postemergence Herbicides (See herbicide label for specific turf species use listing.)				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Sencor 75 Turf (0.188 lb) + MSMA (several trade names and formulations)	metribuzin + MSMA (0.125 + 2.0)	goosegrass, crabgrass, dallisgrass, nutsedge	bermudagrass	This tank mix provides better control of goosegrass than MSMA or Sencor alone. Apply only to established bermudagrass that is actively growing and not under stress. Two applications 7 to 10 days apart may be needed for acceptable control. Do not apply to tees, greens or other closely mowed turf. Do not add surfactant. Do not apply over the root zone of shallow-rooted ornamentals. Will cause temporary discoloration. Delay mowing treated areas for at least 3 days. Applying nitrogen fertilization about 7 days after treatment will speed the recovery of bermudagrass turf.
Segment EC (1.5 to 2.25 pt)	sethoxydim (0.19 to 0.28)		centipedegrass	Centipedegrass only. Do not make more than two applications per season. Safe on centipedegrass seedlings after the third mowing. Crop oil has already been added to Segment EC. Apply no sooner than three weeks after spring green-up. Do not apply Segment EC to newly planted centipedegrass until there has been 3 inches of new stolon growth. Apply before crabgrass becomes well tillered. Do not mow seven days before or after application. Two applications three weeks apart will suppress bahiagrass.
SpeedZone (2 to 5 pt)	carfentrazone (0.05 lb/gal) + 2,4-D (1.53 lb/gal) + MCPA (0.48 lb/gal) + dicamba (0.14 lb/gal)	many broadleaf weeds	bermudagrass, centipedegrass, tall fescue, zoysiagrass, ryegrass	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly established cool-season turfgrasses or four weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until two weeks after application. DO NOT apply at air temperatures > 90° F.
SpeedZone – Southern (2 to 5 pt)	carfentrazone (0.04 lb/gal) + 2,4-D (0.52 lb/gal) + MCPA (0.2 lb/gal) + dicamba (0.05 lb/gal)	many broadleaf weeds	bermudagrass, centipedegrass, tall fescue, zoysiagrass, ryegrass	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly established cool-season turfgrasses or four weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until one week after application. DO NOT apply at air temperatures > 90° F. DO NOT apply during the spring green-up of St. Augustinegrass or to 'Floritam,' 'BitterBlue' and other improved varieties of St. Augustinegrass.
Spotlight 1.5L (0.67 to 2.5 pt)	fluroxypyr (0.13 to 0.47)	henbit, purple deadnettle, woodsorrel, plantains	centipedegrass, tall fescue, zoysiagrass	Do not apply more than 1.33 pt/acre on zoysiagrass or centipedegrass. Newly seeded turf should be mowed two to three times before application.
Tenacity (4 to 8 fl oz)	mesotrione (0.125 to 0.25)	tufted lovegrass, crabgrass	centipedegrass, tall fescue, St. Augustinegrass sod	Apply in 30 gallons of water per acre. Do not apply more than 16 fl oz per year. Add 0.25% nonionic surfactant. Make a repeat application two weeks after the first.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
TranXit 25 DF (1 to 4 oz)	rimsulfuron (0.015 to 0.0625)	henbit, purple deadnettle, woodsorrel, plantains	bermudagrass	May be used: a) to control annual bluegrass before overseeding bermudagrass with perennial ryegrass or <i>Poa trivialis</i> , b) to control annual bluegrass in non-overseeded bermudagrass, c) to control emerged weeds in centipedegrass and zoysiagrass and d) to remove perennial ryegrass or <i>Poa trivialis</i> from bermudagrass in the late spring. Add a nonionic surfactant at 0.25% v/v. Apply 10 to 14 days before overseeding bermudagrass in late summer or early fall. DO NOT apply after overseeding or to bentgrass putting greens. To hasten spring transition on overseeded bermudagrass, apply at the 60% to 75% green-up growth stage of bermudagrass or approximately two to three weeks before transition is desired. DO NOT apply to residential lawns, cool-season turfgrasses or to newly sprigged or sodded bermudagrass.
Trimec, Three Way, Trex-San, Triplet, Triplet Water Soluble, other trade names	2,4-D + MCPP + dicamba (see label)	broadleaf weeds	Kentucky bluegrass, bermudagrass, tall fescue, zoysiagrass	Several commercial formulations are available. Refer to individual labels for recommended amount of formulated product. Controls a broader spectrum of broadleaf weeds than 2,4-D alone. DO NOT spray when turfgrass is emerging from winter dormancy. Low rates of Triplet products may be used on St. Augustinegrass or centipedegrass. Avoid applications if air temperatures exceed 85° F. Delay reseeding for four weeks after treatment.
Trimec Southern (see label)	MCPP + 2,4-D + dicamba (see label)	broadleaf weeds	Kentucky bluegrass, bermudagrass, centipedegrass, tall fescue, zoysiagrass, St Augustinegrass	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray when turfgrass is emerging from winter dormancy. Avoid application if air temperature exceeds 85° F. Delay reseeding for four weeks after application. Refer to label for rates for St. Augustinegrass and centipedegrass.
Triamine, Tri-Ester, Dissolve (see label)	2,4-D + MCPP + 2,4-DP (see label)	broadleaf weeds	Kentucky bluegrass, tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Refer to individual labels for recommended amount of formulated product. Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray at air temperatures greater than 85° F and when warm-season turfgrasses are growing under stress conditions. Delay reseeding for four weeks after treatment. Avoid application when warm-season turfgrasses are emerging from winter dormancy.
Triamine II, Tri-Ester II, Trimec Encore (see label)	MCPA + MCPP + 2,4-DP (see label)	broadleaf weeds	Kentucky bluegrass, tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Refer to individual labels for recommended amount of formulated product. Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray at air temperatures greater than 85° F and when warm-season turfgrasses are growing under stress conditions. Delay reseeding for four weeks after treatment. Trimec Encore is not labeled on St. Augustinegrass.

Postemergence Herbicides

(See herbicide label for specific turf species use listing.)

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Tri-Power (see label)	MCPA + MCPP + dicamba (see label)	broadleaf weeds	Kentucky bluegrass, tall fescue, bermudagrass, zoysiagrass	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT mow one to two days before or after application. Delay application to newly seeded grasses until after three to four mowings. Delay reseeding for three to four weeks after application. Avoid applications during the spring transition of warm-season turfgrasses unless a slight delay in green-up can be tolerated.
Turflon Ester 4EC (1 to 2 pt)	triclopyr (0.5 to 1.0)	broadleaf weeds and partial bermudagrass suppression	tall fescue, perennial ryegrass	Not recommended for warm-season grasses. Repeat applications of 3 pt/acre spaced four weeks apart are recommended for corn speedwell, parsley piert, violets, ground ivy and woodsorrel. Do not use on warm-season species.
Vanquish 4S (0.5 to 1 pt)	dicamba (0.25 to 0.5)	white clover, wood sorrel, dichondra, wild onions, henbit, knotweed, lespedeza, docks and others	bermudagrass, centipedegrass, tall fescue, zoysiagrass	Do not apply over the root zone of shallow-rooted ornamental trees and shrubs. Repeat applications may be needed. Do not exceed 1.0 lb/A during the growing season. Do not apply to St. Augustinegrass. Vanquish is relatively mobile in the soil profile, so care should be exercised in its use around the root zone of broadleaf species.

Putting Greens, Annual Bluegrass and Bermudagrass Suppression

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Trimmit 2EC (16 oz)	paclobutrazol (0.25)	annual bluegrass suppression	bentgrass putting greens	For <i>Poa annua</i> suppression, apply once or twice in mid-fall (September-November) plus once or twice in early spring (March-April) while the bentgrass is actively growing. Do not exceed three applications per year. Apply in combination with a non-burning fertilizer. Water-in with at least 0.25 inch of irrigation within 24 hours of application. In spring, apply at least one month before onset of high temperatures. Do not use on areas containing more than 70% <i>Poa annua</i> . Do not use more than 0.25 lb active ingredient per acre on bentgrass. Research has shown that application of a sterol-inhibiting fungicide (DMI) applied two weeks after each paclobutrazol application may improve control. This program is designed to encourage a gradual transition from <i>Poa annua</i> to bentgrass and will take repeat applications over several years.
Prograss 1.5 EC + Cutless 50 W (see comments)	ethofumesate + flurprimidol (see comments)	bermudagrass encroachment	creeping bentgrass greens	Make the first application in April using 3.0 fl oz Prograss 1.5EC + 0.6 oz of Cutless 50W when bermudagrass is breaking dormancy. Make the second application six weeks later (1.7 oz + 0.14 oz) followed by third and fourth applications spaced three weeks apart. The first treatment supplies temporary bermudagrass suppression. Repeat treatments are needed to maintain suppression. Approximately 30 percent bermudagrass discoloration and thinning may follow high rate but should recover within three weeks.
Tupersan 50W (20 lb)	siduron (10.0)	bermudagrass encroachment	creeping bentgrass greens	The effectiveness of this treatment for bermudagrass encroachment is variable. Make the first application in late April when bermudagrass begins to grow. A typical schedule would be: April + May + early June and then late September + October + November. Apply on an 8- to 12-inch band using a single nozzle. Failing to start early when bermudagrass is breaking dormancy will reduce the chances of success. Water-in with at least 0.5 inch of water within three days of application.

Putting Greens, Preemergence				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Bensumec 4LF Pre-San 7G (7.5 to 12.5 lb) (7.5 to 12.5 lb)	bensulide (1.9 to 3.1 gal) (107.0 to 180.0 lb)	controls annual grasses and selected broadleaf weeds	bentgrass, bermudagrass	Apply high rate in fall for annual bluegrass control. Apply a light irrigation immediately after treatment. DO NOT apply to newly sprigged grasses. Delay reseeding for four months after treatment.
Goosegrass/ Crabgrass Control (115 lb)	bensulide + oxadiazon (6.0 + 1.5)	controls summer annual grasses	bentgrass, bermudagrass	Apply a light irrigation after treatment. DO NOT use on newly sprigged grasses until well established. Delay reseeding for five months after treatment. See label for precautions concerning use on putting greens.
Kerb T/O (2 to 4 lb)	pronamide (1.0 to 2.0)	preemergence or postemergence applications of Kerb will control annual bluegrass	bermudagrass	Apply to non-overseeded bermudagrass greens. Do not apply closer than 90 days before overseeding cool-season grasses unless deactivation with activated charcoal is planned. To deactivate Kerb with activated charcoal, such as Gro-Safe, use 10 lb charcoal per 1,000 sq ft. Reseed no sooner than seven days after charcoal application. A light overhead irrigation is necessary to move Kerb into the weed root zone if no rainfall occurs within 24 hours. DO NOT apply Kerb to any cool-season turfgrass. Kerb is a restricted use herbicide.
Rubigan, Patchwork (see label)	fenarimol (see label)	annual bluegrass	overseeded bermudagrass	Fenarimol is a systemic fungicide that reduces the infestation level of annual bluegrass. May be applied as a sequential treatment to bermudagrass greens overseeded with perennial ryegrass, <i>Poa trivialis</i> or bentgrass. Use the triple application program if bentgrass or <i>Poa trivialis</i> is used for overseeding. For double applications, apply 6.0 fl oz of Rubigan AS or 6.0 lb of Patchwork per 1,000 sq ft with the last application two weeks prior to overseeding ryegrass. For triple applications, apply 4.0 fl oz of Rubigan AS or 4.0 lb Patchwork per 1,000 sq ft with the last application two weeks prior to overseeding ryegrass or four weeks prior to overseeding bentgrass or <i>Poa trivialis</i> . A single application of Rubigan AS at 2.0 fl oz or Patchwork at 2.0 lb per 1,000 sq ft in January or February will help maintain annual bluegrass control. Rubigan will not control perennial bluegrass.
Tupersan 50 WP (4.0 to 24.0 lb)	Siduron (2.0 to 12.0)	crabgrass	May be applied at the time of seeding or to established creeping bentgrass for crabgrass control.	Siduron does not control goosegrass or annual bluegrass. Irrigate within three days of application with 2 inches of water per acre if rainfall does not occur. Tupersan at 1.0 lb product per 1,000 sq ft may be used as band treatment along the perimeter of creeping bentgrass putting greens to suppress stolon growth of bermudagrass. Make the initial application in the March/April time frame. Repeat applications can be made at four- to five-week intervals.

Putting Greens, Postemergence				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
Mecomec 4 (2 to 2.7 pt)	mecoprop (1.0)	broadleaf weeds	bentgrass, bermudagrass	Use only on actively growing turf that is not under stress. Do not apply MCP, 2,4-D or other growth regulator herbicides to bermudagrass greens during transition.
Trimec Bentgrass (2.7 pt)	mecoprop + 2,4-D + dicamba (0.5 + 0.15 + 0.06)	broadleaf weeds	bentgrass, bermudagrass	Check label for rates because formulations vary from brand to brand. Do not apply to bentgrass under stress. Do not apply 2,4-D or other growth regulator herbicides to bermudagrass greens during transition.
Illoxan 3EC (1 to 1.4 qt)	diclofop (0.75 to 1.0)	goosegrass, ryegrass	bermudagrass	Illoxan may be used for goosegrass control on bermudagrass golf greens, tees and fairways. Use the high rate for goosegrass with one to two tillers. Lower rates may be used on smaller goosegrass. DO NOT mow for 24 to 36 hours after application. Control requires two to three weeks. May cause temporary phytotoxicity (7 to 10 days). DO NOT tank mix with other pesticides or fertilizers as control will be reduced. DO NOT overseed treated areas for at least two months after the last application.
Monument 75DG (0.33 to 0.56 oz)	trifloxysulfuron (0.015 to 0.026)	Controls nutsedges, annual sedges, kyllinga species and certain broadleaf weeds in established bermudagrass putting greens	Applications should be made to actively growing bermudagrass after 100% spring green-up.	Monument is not recommended for use on creeping bentgrass. Add a nonionic surfactant at 0.25% to 0.5% v/v to the spray mix. Monument at rates of 0.1 to 0.3 oz per acre may be used as a spring transition aid for the removal of perennial ryegrass and <i>Poa trivialis</i> . Avoid mowing for one to two days before and after application. For nutsedge repeat the application at four to six weeks if regrowth is observed. DO NOT overseed bermudagrass with cool-season turfgrasses for three weeks after application.
Revolver (8.8 to 26.2 fl oz)	foramsulfuron (0.013 to 0.4)	goosegrass, annual bluegrass, ryegrass	bermudagrass	Apply Revolver for: a) control of emerged annual bluegrass two weeks before overseeding bermudagrass with perennial ryegrass, b) postemergence control of goosegrass in late spring and early summer and c) spring transition of bermudagrass overseeded the previous fall with cool-season turfgrasses. DO NOT apply Revolver within two weeks of sprigging. Revolver is rainfast within two hours of application. Revolver must be allowed to dry on bermudagrass foliage before traffic is allowed through treated areas. Revolver is NOT recommended for use on creeping bentgrass greens.

Putting Greens, Postemergence

Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrass Use	Comments
<p>TranXit (1 to 2 oz)</p>	<p>rimsulfuron (0.016 to 0.032)</p>	<p>annual bluegrass, ryegrass, <i>Poa trivialis</i></p>	<p>bermudagrass</p>	<p>May be used: a) to control annual bluegrass before overseeding bermudagrass with perennial ryegrass or <i>Poa trivialis</i>; b) to control annual bluegrass in non-overseeded bermudagrass; and c) to remove perennial ryegrass or <i>Poa trivialis</i> from bermudagrass greens in the late spring. Add a nonionic surfactant at 0.25% v/v. Apply 10 to 14 days in late summer or early fall before overseeding bermudagrass. DO NOT apply after overseeding or to bentgrass putting greens. To hasten spring transition on overseeded bermudagrass, apply at the 60% to 75% green-up growth stage of bermudagrass, or approximately two to three weeks before transition is desired. Irrigate within two hours of a TranXit application and then follow normal irrigation schedule. TranXit is NOT recommended for use on creeping bentgrass putting greens.</p>

Sedge Control and Turf Tolerance Ratings
 (See herbicide label for specific turf species use listing.)

Herbicides	Sedge Control					Turf Tolerance (excluding greens)				
	Annual Sedge	Purple Nutsedge	Yellow Nutsedge	Annual Kyllinga	Perennial Kyllinga	Bermudagrass	Centipedegrass	St. Augustinegrass	Tall Fescue	Zoysiagrass
Basagran T & O (bentazon)	G	P	G	F-G	F-G	S	S	S	S	S
Certainty (sulfosulfuron)	G	G	G	G	G	S	S	S	NR	S
Dismiss (sulfentrazone)	G	P-F	F	F	F	S	S	NR	S	S
Image (Imazaquin)*	G	G	F	G	G	S-I	I	I	NR	S-I
Image + MSMA	G	F-G	G	G	G	S-I	NR	NR	NR	S-I
SedgeHammer (halosulfuron)*	G	G-E	G-E	G	F-G	S	S	S	S	S
Monument (trifloxysulfuron)	G	G	G	G	G	S	NR	NR	NR	S
MSMA*	G	P-F	F	G	G	S-I	NR	NR	NR	S
Pennant (metolachlor) PRE	G	F	G	F-G	P	S	NR	NR	NR	NR

G = Good, **F** = Fair, **P** = Poor, **S** = Safe, **I** = Intermediate, **NR** = Not recommended

These are relative rankings. Performance will vary with environmental conditions, application timing, turfgrass vigor, etc. This table is intended only as a guide. Repeat applications are needed for complete control of all herbicides.

*Use a five- to seven-day interval for MSMA and three- to eight-week interval for Image or SedgeHammer.

Sedges				
Trade Name (product/A)	Common Name (lb/ai/A)	Weeds Controlled	Turfgrasses	Comments
Basagran T/O (2 to 4 pt)	bentazon (1.0 to 2.0)	yellow nutsedge, globe sedge, annual sedge, many broadleaf annual weeds	tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Apply bentazon to emerged yellow nutsedge actively growing under good soil moisture conditions. Apply 2 to 3 pt/A and follow 10 to 14 days later with an additional application, if necessary. Thorough spray coverage is essential for acceptable control. Spot spraying may result in turf injury. Do not mow three to five days before or after application. Does not control purple nutsedge.
Certainty (0.75 to 1.25 oz)	sulfosulfuron (0.035 to 0.094)	annual bluegrass, sedges, ryegrass, tall fescue, johnsongrass	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Add 0.25% nonionic surfactant. May be used on commercial and residential turf. Do not apply within 4 feet of golf greens. Add 0.1 oz per 10 gallons of water for spot treatment.
Dismiss 4L (1/4 to 3/4 pt)	sulfentrazone (0.125 to 0.375)	Suppresses and controls annual sedges, purple and yellow nutsedge and kyllingas. Also control various broadleaf weeds.	bermudagrass, centipedegrass, Kentucky bluegrass, ryegrass tall fescue zoysiagrass	Add a nonionic surfactant at 0.25% v/v (1 quart per 100 gallons of spray solution). Good coverage is needed for optimum control. Rates less than 12 fl oz/acre will generally suppress most sedges for at least 60 days and require a second application. Temporary discoloration may result due to use of surfactant. Test compatibility of surfactant before use.
Image 70 DG (11.4 oz)	imazaquin (0.5)	purple nutsedge, kyllinga, wild garlic, some broadleaves	bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	Add a nonionic surfactant (1.0 qt per 100 gal). The addition of MSMA @ 2 lb/ai/A (bermudagrass only) will aid in control of nutsedges and escaped weedy grasses. Do not apply when turfgrass is emerging from winter dormancy. Image will severely injure fescues and ryegrasses. Do not apply to newly planted or sprigged lawns or golf greens. Multiple applications of imazaquin at high rates will inhibit turfgrass growth.
Monument 75 DF (0.33 to 0.56)	trifloxysulfuron (0.015 to 0.026)	yellow and purple nutsedge, kyllinga	bermudagrass, zoysiagrass	Add 0.25% nonionic surfactant. Do not use on cool-season grasses, centipedegrass or St. Augustinegrass. Do not apply where runoff onto cool-season grasses may occur. Repeat application when regrowth appears. Rainfast within three hours of application.
MSMA (2.6 to 3.3. pt)	MSMA (2.0 to 2.5)	yellow nutsedge, annual sedge	bermudagrass, zoysiagrass	Repeat applications will be needed 10 to 14 days apart. Most effective on kyllinga and annual sedges.
SedgeHammer 75DF (0.66 to 1.33 oz)	halosulfuron (0.031 to 0.062)	most nutsedges and kyllinga species	all turfgrasses	Apply to three- to eight-leaf nutsedge. Use 0.5% nonionic surfactant. Two applications may be made. Do not exceed 0.125 lb/ai/A in a single season. Not labeled for putting greens. For spot treatment, mix 0.9 gram of SedgeHammer in 1 gal of water with 1/3 oz surfactant. Do not mow for two days before and after application.

Growth Regulators			
Turfgrasses	Common Name (lb/ai/A)	Trade Name (product/A)	Comments
tall fescue	mefluidide (1.0)	Embark 2S (4 pt)	Apply after uniform spring green-up but prior to seedhead emergence. Suppresses vegetative and seedhead development. Recommended for turfgrasses on difficult-to-mow sites. Not recommended for turfgrasses when maintained under intensive management systems. Do not mow two days prior to or after application. Remove clippings prior to application. The addition of a nonionic surfactant (0.25% v/v) may enhance suppression; however, temporary discoloration may increase. Do not apply within four growing months of seeding or reseed within three days of application. Embark requires an eight-hour rain-free period for optimum activity. Embark is effective on cool-season grasses.
bahiagrass, bentgrass, Kentucky bluegrass, bermudagrass, centipedegrass, St. Augustinegrass, tall fescue, zoysiagrass	trinexpac-ethyl (see label)	Primo 1EC Primo 25WSB (see label)	Foliar absorbed and rainfast within one hour. Apply 3 oz/A for 'Tifdwarf' bermudagrass greens and 6 oz/A for 'Tifgreen.' A typical program for a 'Tifway' or common bermudagrass fairway would be 11 fl oz of Primo 1EC per acre starting around June 1 and repeated at four-week intervals through the peak growing season. Rates for zoysiagrass fairways should be 6 to 8 oz/A for 'Meyer' and 8 to 10 oz/A for 'El Toro.' Do not mow 12 hours before or after application to minimize injury. May also be used as a winter overseeding aid to retard bermudagrass and allow overseeded cool-season grasses to become established. Apply 22 oz/A one to five days before overseeding and before verticutting, scalping or spiking. Do not add a surfactant. To extend the life of painted lines on sports fields, add 1 oz of Primo 1EC or 1/2 oz Primo 25 WSB to each gallon of marking paint. Extends life of lines 7 to 14 days on cool-season and up to 30 days on warm-season grasses.
Tifdwarf and Tifgreen bermudagrass greens	gibberellic acid (10.0 grams ai/A)	RyZup 4% (10 fl oz/A or 0.23 fl oz/1,000 sq ft)	Apply 10 grams ai/A weekly or 25 grams ai/A every two weeks in 25 to 100 GPA to promote growth and prevent discoloration during periods of cold stress and light frost on 'Tifgreen' or 'Tifdwarf' bermudagrass. Do not apply when night temperatures exceed 65° F.
bermudagrass (Tifway, Tifgreen, common), zoysiagrass	flurprimidol (see label)	Cutless 50W (see label)	Cutless may be used on medium- to high-quality, well-maintained turfgrasses. Refer to label for rates for different bermudagrass cultivars and zoysiagrass. Make the first application after full spring green-up (usually mid-May to mid-June). An additional application may be made in late summer to bermudagrasses only. Treated areas should receive 0.5 inch of rainfall or irrigation within 24 hours of application. Make uniform application with a boom-type sprayer and avoid overlaps.
bentgrass putting greens	flurprimidol (see label)	Cutless 50W (see label)	Apply to actively growing bentgrass putting greens to suppress annual bluegrass. Apply in the spring after 3 to 4 mowings or in the fall. If necessary, repeat the application at three- to six-week intervals. DO NOT exceed 2.0 lb ai/acre per growing season. Make the final fall application eight weeks before the onset of winter dormancy. Delay reseeding for two weeks after application.
bahiagrass, Kentucky bluegrass, tall fescue, common bermudagrass	maleic hydrazide (3.0)	Retard (1.3 gal)	Apply after uniform spring green-up but prior to seedhead emergence. Suppresses vegetative growth and seedhead development. If seedheads have already formed, mow one week after application to remove emerged seedheads. Recommended for turfgrasses on difficult-to-mow sites. Not recommended for turfgrasses when maintained under intensive management systems. Remove clippings prior to application. DO NOT apply to turf less than three years old and delay reseeding for three days. DO NOT add a surfactant. Maleic hydrazide requires a 12-hour rain-free period for optimum activity.

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