

Publication 427-045

Revised 1988

LAWN WEED CONTROL

S. W. Bingham, Extension Weed Scientist and Professor, Weed Science
Department of Plant Pathology, Physiology and Weed Science
College of Agriculture and Life Sciences
Virginia Tech

INTRODUCTION

Turfgrasses are used to beautify grounds around homes, businesses, industries, parks, educational facilities, and on golf courses. Quality is a relative term and is dependent upon the level of management that the lawn is provided. High-quality lawns do not happen by accident. High quality is dependent on many factors such as turfgrass variety, fertilization, irrigation, soil type, and pest management. One important consideration is correct use of herbicides for weed control.

Weeds will compete with turfgrasses in lawns for space to grow as well as for water and nutrients. Most weeds reduce quality of the lawn by irregular growth in relation to the turfgrass. Sometimes weeds grow faster and appear above the desired clipping height in 1 or 2 days. Uneven texture and height of weedy grasses gives an undesirable low-quality appearance. When weeds are controlled and other management practices are improved, the quality of the lawn is improved.

Gradually over the years, an excellent arsenal of herbicides has been developed for weed control in lawns. This publication is directed toward lawn turfgrasses including bluegrass, tall fescue, fine fescue, perennial ryegrasses, and bermudagrass. These recommendations are not intended for bentgrass or bermudagrass under golf green management.

PREEMERGENCE CONTROL OF CRABGRASS

Annual grasses are effectively controlled with preemergence and postemergence herbicides. Crabgrass, foxtail, and barnyardgrass are all quite effectively prevented by a number of preemergence compounds. In addition, each basic herbicide ingredient may be formulated into many products (sometimes 25 or more). With a wide variety of formulations, it is important to follow label instructions carefully. The preemergence herbicides are applied in early spring before seedling crabgrass can be observed. Generally, it is too late when you see the seedling emerging in the lawn. Preemergence herbicides applied in the spring will be sufficiently degraded or lost during the summer to allow fall seeding of thin turfgrass areas.

Basic Choices of Preemergence Herbicides

Benfin (Balan): Apply 3 lb of 2.5% granular (gran) per 1000 sq ft in

LD
Sle55

AT162

no. 427-045

VPI
Spec

late winter or early spring before crabgrass seedlings emerge. A second application after 4 months may be required to maintain effective crabgrass control into late summer and fall.

Bensulide (Betasan, Betamec, Lescosan, Presan): Follow label directions for proper rate. Suggestions are 7 to 8 oz of a 4 lb/gal EC, 6 to 7 lb of 3.6% gran, 3 lb of 7% gran, or 2 lb of 12-1/2% gran per 1000 sq ft for crabgrass control. When the low label rate of 7-1/2 lb active ingredient (a.i.) per acre (6 oz of a 4 lb/gal formulation) is used, a second application may be desirable to prevent late germinating crabgrass establishment. This application may be made about 4 months after the initial treatment.

DCPA (Dacthal): Use 1/3 lb of 75% wettable powder (WP) or 4 to 4-1/2 lb of 5% gran per 1000 sq ft. A second application after 2 months at one-half the regular rate may be required to control late germinating crabgrass. Newly seeded turfgrass may be treated with DCPA after turfgrass has grown sufficiently to require 2 clippings.

Oxadiazon (Ronstar): Use 3 to 4 lb of 2% gran per 1000 sq ft in early spring prior to crabgrass emergence. Lawns containing red fescue are not sufficiently tolerant for Ronstar treatment. Excellent results have been obtained on bluegrass and bermudagrass lawns. Tall fescue and perennial ryegrasses are sufficiently tolerant to oxadiazon at the low label rate (2-1/3 lb of 2% gran per 1000 sq ft).

Pendimethalin (Turf Builder plus Halts 1.03%, or Halts 1.71%, or 60 WDG): Apply in spring before emergence of crabgrass using 3-1/3 lb of Turf Builder plus Halts or 2-1/4 lb of Halts per 1000 sq ft. This rate is equivalent to 1-1/2 lb ai per acre of pendimethalin and about 0.9 lb of nitrogen per 1000 sq ft. Use spreader settings provided on product as a guide for calibration. Use the 60 WDG formulation at 1.2 oz per 1000 sq ft (1.8 oz where some goosegrass has occurred). Use turf Builder plus Halts only when fertilizer is also required. A repeat treatment may be necessary in 8 weeks where heavy infestations have occurred in the past.

Siduron (Tupersan): Apply in spring just before expected emergence of crabgrass. Use 6 to 9 oz of 50% WP per 1000 sq ft on established turfgrasses or 4-1/2 oz of 50% WP on new spring plantings. A second application of 4-1/2 oz of the 50% WP is needed about 1 month later in the new lawn to maintain a desirable level of crabgrass control during the summer. Do not use on bermudagrass lawns. Tupersan can be used at any stage of turfgrass development. Either rainfall or irrigation (1/2 inch) is necessary within 3 days after treatment for best results.

GOOSEGRASS CONTROL

Oxadiazon (Ronstar or Goosegrass/Crabgrass Control): Apply 3-1/2 to 4 lb of 2% gran per 1000 sq ft for goosegrass control in bermudagrass and bluegrass. In perennial ryegrass and tall fescue, use 2-3/4 to 3-1/4 lb of 2% gran per 1000 sq ft. Oxadiazon (one application) has consistently given a high level of goosegrass control for a full season.

Use 2.6 lb of goosegrass/crabgrass control product per 1000 sq ft. Rainfall or 1/4 inch of water by irrigation after application will improve efficacy of these products.

Benefin (Balan): Use 2-3/4 lb of 2.5% gran formulation per 1000 sq ft in early spring and repeat at 2 lb of 2.5% gran after 8 weeks. (The second treatment should be timed just before goosegrass begins to germinate in late spring). Oxadiazon may be substituted for the second treatment if desired.

Benefin plus oryzalin (XL Herbicide): This combination of herbicides may be used for crabgrass, goosegrass, and other annual grasses in warm season turfgrasses (bermudagrass). For crabgrass and goosegrass control, use 2-1/2 to 3-1/3 lb/1000 sq ft of a 1% plus 1% formulation in early March. Use the high rate, especially in areas where goosegrass has been experienced during the past few years. Do not use on cool-season turfgrasses.

Pendimethalin (Turf Builder plus Halts, Halts, or 60 WDG): Apply as for crabgrass control, and repeat the application after 8 weeks.

POSTEMERGENCE CONTROL OF SUMMER ANNUAL GRASSES

Various postemergence herbicides are available for crabgrass control. Some discoloration of the desirable turfgrass is expected for a few weeks after each use. For best results, apply the herbicides to young, small crabgrass, preferably before tillering or when plants have no more than 3 tillers.

Arsenicals (Daconate, Methar 30, Chipco Crab Kleen, and many others usually containing the words "Crabgrass Killer"): The active ingredient is usually one of the following: DSMA, MSMA, MAMA, and CMA. Label directions must be followed for the correct rate from each formulation. Except with very young crabgrass or foxtail, two applications at 7- to 10-day intervals are required for adequate control. Better results are encountered with good turfgrass growing conditions (moisture adequate and mild temperatures) as opposed to cold, dry weather. Arsenical herbicides become more active at high temperatures and as a result should not be used above 90° F. because too much discoloration and injury will occur on the turfgrass. Bermudagrass, bluegrass, and zoysiagrass have shown good tolerance to rates suggested on the labels. Under ideal weather conditions (70 to 80° F and adequate moisture), fescue and bentgrass are suggested on certain formulations. Lower rates are generally used on bentgrass, and applications are repeated for selective control.

The arsenical herbicides are very economical for selective crabgrass control in early developmental stages. However, the majority of homeowners and turfgrass managers prefer the preemergence method of annual grass control because there is some temporary discoloration of the turfgrass as a result of using arsenicals. Also, preemergence control of goosegrass is far more effective than with arsenical herbicides.

Fenoxaprop (Acclaim): Postemergence control of annual grasses with fenoxaprop is selective in Kentucky bluegrass, tall fescue, fine fescue, and perennial ryegrass. Only emerged annual grass at the time of spraying will be

controlled. Young, actively growing annual grasses are more easily controlled than older, more mature stands (little or no control is expected of mature crabgrass). Consequently, make applications before annual grasses have 5 tillers. Kentucky bluegrass should be well established and more than one year old before treatment because severe injury may result. Avoid fenoxaprop application in Kentucky bluegrass until after June 15 each year. A second application is permitted when crabgrass emerges several weeks later.

CONTROL OF PERENNIAL WEEDY GRASSES

Dallisgrass: The labels on postemergence crabgrass killers discussed contain instructions for dallisgrass control. Usually, the higher rate listed on the label is utilized and 3 applications at 7- to 10-day intervals are required. Remember, the turfgrass will be discolored (yellowish) for 4 to 6 weeks. The application is made during active growth of dallisgrass and the turfgrass. Manage the turfgrass to encourage complete cover during a short interval after removing the dallisgrass.

Orchardgrass, Quackgrass, Bermudagrass, Tall Fescue: These undesirable perennial grasses cannot be selectively controlled. For non-selective control, use glyphosate (Roundup) as directed in the labeling of the formulation. The undesirable perennial grass is allowed to grow to 4-to 6-inch height before treatment. At 1 week after treatment, remove the shoots of the dead grasses and reseed in the surface of the soil. The area may also be resodded if desired.

It is essential that the weedy perennial grass be in an active growth stage at the time of treatment.

BROADLEAF WEED CONTROL

The phenoxy herbicides (2,4-D and related compounds) are taken up through plant foliage and then moved throughout the plant. They are extremely active in low concentrations, and care must be taken to see that they do not contact desirable ornamental and garden plants. When applied as a spray, spray drift must be prevented. Spray when the wind is not blowing, keep the sprayer pressure low (20 to 30 psi), and use a nozzle that will deliver large droplets rather than a fine mist (8003 fan type, TK 2.5 flooding tip, or equivalent). Keep the nozzle as close to the ground as feasible. Hose proportioners are widely advertised for applying the pesticides, but it is difficult to apply growth-regulator herbicides through hose proportioners without drift of the spray to desirable plants or to obtain uniform coverage with the herbicide. Do not use a sprayer that has contained a growth regulator herbicide to spray shrubs and garden plants or injury may occur.

Several herbicides have been combined with fertilizers to facilitate application. As the 2,4-D-like materials are primarily active through the foliage, applications must be made at the time when the material will adhere. This is usually in the morning when a light dew is on the grass and weeds. Dicamba (Banvel-D) is active through the soil and taken up by the plant roots as well as through the plant foliage. Because of its soil activity, granular formulations of dicamba usually give better control of many weeds than the 2,4-D-like materials. Dicamba also controls weeds such as dock and red

sorrel (sheep sorrel) that are resistant to phenoxy herbicides. Numerous cases of injury have resulted when "weed and feed" formulations containing dicamba were applied in the root area of desirable ornamentals. Injury is increased by over-application in an attempt to fertilize shrubs and trees with the "weed and feed" materials. Movement of dicamba in the soil is influenced by soil type and rainfall. Sandy soil or heavy rainfall increase the chance of injury.

2,4-D: Some common weeds that are controlled with 2,4-D in lawns are bitter-cress, buttercup, wild carrot, catsear, chickory, cranesbill, dandelion, hawkweed, mustards, pennycress, broadleaf and narrow-leaf plantains, pepper-weed, ponyfoot, shepherdspurse, sowthistle, plumless thistle, musk thistle, and others. Spotted knapweed and wild garlic are controlled with some difficulty. Use 1-1/2 lbs of 2,4-D in 30-50 gals of water per acre. This would be equal to about 2 tablespoons (4 lbs per gal acid equivalent) of 2,4-D in 1 gal of water for each 1000 sq ft. Apply either in late fall or early spring when the weeds and turf are actively growing. Active growth of weeds is usually sufficient when mid-day temperatures exceed 60°. The late fall is usually preferred because there is less likelihood of injury to desirable plants from spray drift. Do not apply near susceptible plants (tomatoes, grapes, roses, beans, etc.). Do not use on new turf until grass has been mowed twice. White clover will be damaged, but recovers. Spraying during hot, dry periods may cause injury to the grass.

Dicamba (Banvel): Dicamba kills certain weeds that are resistant to 2,4-D. Dicamba is a good selection for knotweed, smartweed, curly dock, red sorrel, bedstraw, chickweeds, groundivy, black medic, knawel, white clover, yarrow, lespedeza, prostrate and spotted spurge, purslane, henbit, and several of the weeds listed for 2,4-D. Dicamba is used at a lower rate than 2,4-D. Use 2 tsp of a 4 lb/gal Banvel formulation in 1 gal of water per 1000 sq ft. Do not apply dicamba to the root area of shallow-rooted shrubs and trees. Dicamba fails to adequately control plantains.

2,4-D and dicamba (Several formulations): A tank mixture of 2,4-D and dicamba has consistently controlled a wide range of broadleaf weeds (see list under both 2,4-D and dicamba). Several formulations are available in which the 2 herbicides are already mixed for use on turfgrasses. The ratio of 2,4-D to dicamba in the formulation mixtures is usually about 3 to 1 or 4 to 1. The total active ingredient should not exceed about 1-1/2 lb/A for most weeds.

Mecoprop (MCP): White clover, chickweeds, hop clover, lespedeza, and spotted spurge (seedlings) are controlled quite well with mecoprop at 1-1/2 to 2 lb/A (4 tbsp of 2.5 lb/gal acid equivalent mecoprop in 1 gal of water per 1000 sq ft).

2,4-D plus mecoprop: A tank mixture or formulation containing both is more commonly used than mecoprop alone. The mecoprop has a limited spectrum of susceptible broadleaf weeds and 2,4-D is mixed with mecoprop to provide better control of a wide range of weeds. See weeds listed under 2,4-D and mecoprop for the effectiveness of the mixtures.

2,4-D plus mecoprop plus dicamba (Trimec classic): Tank mixtures and formulations of three-way mixtures are sometimes used. These mixtures are utilized to reduce the level of dicamba needed to obtain good weed control. These are excellent formulations of broadleaf herbicides that provide a broad spectrum of weed control. In many instances, however, all three active ingredients are not required for excellent weed control. In some cases, the amount of dicamba in the formulated mixtures is too low.

2,4-D and dichlorprop (Weedone DPC): Use 3 oz of 0.95 lb/gal of each 2,4-D and dichlorprop formulation per 1000 sq ft after broadleaf weeds are growing actively. Dandelions, plantain, catsear, chicory, hawkweed, and other weeds that are rosettes during winter are best controlled with fall applications. White clover, chickweed, henbit, and other weeds that revert to vegetative growth in fall are also readily controlled in late fall. Yellow woodsorrel, a summer annual, requires treatment in mid to late spring. Groundivy responds to dichlorprop but may require more than one application per year. Knotweed and sparges must be treated in spring or summer while these weeds are in seedling stage. This is an excellent formulation for use in lawns, parks, golf courses, athletic fields, and industrial turfgrass areas. Do not use on bentgrass greens or tees. May be used at 6 to 10 weeks after seeding new lawn (mown at least twice).

2,4-D plus dichlorprop plus dicamba (Super Trimec): Use 3/4 to 1 oz of 2+2+0.5 lb ai/gallon formulation per 1000 sq ft for a wide spectrum of broadleaf weeds in turfgrasses such as lawns, golf courses, cemeteries, sod farms, parks, roadsides, and other general turfgrass areas. Apply in fall or spring when weeds are actively growing. Do not apply to the root area of shallow-rooted shrubs and trees or over the root zone of any shrub or tree in sandy soil. The amount of dicamba in this formulation is adequate for maximum weed response.

2,4-D plus triclopyr (Turflon D and Turflon II): A broad spectrum of broadleaf weeds is controlled using 1-1/2 oz of a 2 plus 1 lb/gal formulation. For certain hard-to-kill broadleaf weeds, a second application may be made after 4 weeks (groundivy, wild violets, woodsorrel, sparges, and speedwell). Apply second application only if needed for living plants or re-growth. This formulation may be used in cool-season turfgrasses (tall fescue, bluegrass, and perennial ryegrass).

2,4-D plus Mecoprop plus dichlorprop (Weedestory Triamine, Weedestory Tri-Ester): These three-way postemergence selective broadleaf herbicide formulations contain 2,4-D, mecoprop, and dichlorprop at 1.4 lb ai of each herbicide (except 2 lb ai dichlorprop in the amine formulation). These formulations is used at about 1 oz per 1000 sq ft. A broad spectrum of broadleaf weeds is effectively controlled in lawns, golf courses, parks, sod farms, cemeteries, highways, and general turfgrass areas.

MCPA plus Mecoprop plus dichlorprop (Weedestory Triamine II, Weedestory Tri-ester II): These three-way postemergence selective broadleaf herbicide formulations contain MCPA, mecoprop, and dichlorprop. They are used in lawns, golf courses, parks, highways, sod farms, and general turfgrass areas. The formulation contains 1.4 lb per gallon of each herbicide (except 2 lb ai dichlorprop in the amine formulation). These formulations are used at 1 to

1.4 oz per 1000 sq ft. Do not use ester formulations when temperature is above 85° F, and avoid spray drift (use sprayer with coarse droplets and no fine mist). Use fall or spring applications when weeds are actively growing.

Bromoxynil (Brominal, Buctril): Broadleaf weeds emerge rapidly in newly seeded turfgrasses. Bromoxynil is utilized in young seedling turfgrasses (1-leaf stage) before broadleaf weeds reach the 3- to 4-leaf stage. The competition from broadleaf weeds is reduced tremendously in the seedling turfgrasses, and, after two to four mowings, the herbicides listed above may be used to give continued broadleaf weed control. See product labels for details on rates and timing of treatments. Tank mixing bromoxynil with the other herbicides discussed is also possible after the turfgrasses are established. Bromoxynil is a good choice in seedling turfgrasses for control of mustards, pennycress, smartweed, groundsel, henbit, knawel, pepperweed, shepardspurse, and yellow rocket (all in less than 4-leaf stage). In newly seeded turfgrasses, several crop weeds are usually present and bromoxynil has a good effect on pigweeds, cocklebur, lambsquarter, ragweed, and annual morningglory.

The availability of many formulations of the various broadleaf herbicides, which vary in amount of active ingredient, makes it difficult to establish a general rate to apply to 1000 sq ft or to the proper amount of formulation to use. With a 4 lb/gal formulation, 1 qt contains 1 lb of active ingredient and a rate given in lb/A is equal to qt/A. To convert to small areas, 1 qt/A = 1-1/2 tbs/1000 sq ft.

Conversion for small-area application

Rate desired	Formulation available			Formulation available		
	1 lb/gal	2 lb/gal	4 lb/gal	1 lb/gal	2 lb/gal	4 lb/gal
	Quarts/Acre			Tablespoons/1000 sq ft		
1/3 lb/A	1-1/2	3/4	3/8	2-1/4	1-1/8	9/16
1/2 lb/A	2	1	1/2	3	1-1/2	3/4
1 lb/A	4	2	1	6	3	1-1/2
1-1/2 lb/A	6	3	1-1/2	9	4-1/2	2-1/4
2 lb/A	8	4	2	12	6	3

One quart per acre is equal to 1-1/2 tablespoons per 1000 sq ft.

ZOYSIAGRASS

Crabgrass and Goosegrass Control

Zoysiagrass is utilized in Eastern Virginia for lawns to some degree and herbicides suggested for control of annual grasses in established zoysia-

grass turfgrass include: benefin, bensulide, oxadiazon, and siduron. Oxadiazon is particularly a good choice where goosegrass is part of the problem. See previous sections for rates and timing of applications. DSMA and MSMA may also be used for postemergence crabgrass control in zoysiagrass turfgrass.

Broadleaf Weed Control

MCPP and 2,4-D are utilized for control of many broadleaf weeds in zoysiagrass. Read label directions for inclusion of this turfgrass. In many instances, labels will indicate established turfgrasses and will have a list of turfgrasses excluded from label use. In most cases, zoysiagrass is not listed as an exclusion. On some labels, tolerant turfgrasses are listed and formulations for use on zoysiagrass can be specifically selected.

ANNUAL BLUEGRASS CONTROL IN FALL

Annual bluegrass is a common winter annual weed in turfgrasses throughout Virginia and the United States. Numerous herbicides provide safe and efficient preemergence annual bluegrass control; however, management regimes are utilized in some cases that encourage survival through the summer into a second year. As we have more and more survival into the second year, preemergence herbicides become less effective for annual bluegrass control.

Bensulide (Betasan), benefin (Balan), oxadiazon (Ronstar): Apply in late August, before annual bluegrass germinates, at the normal rates used for crabgrass control. Spring treatments will not provide sufficient residual activity for appreciable annual bluegrass control during fall. Do not overseed or reseed for 4 or more months after these treatments.

Ethofumesate (Prograss): Apply to dormant bermudagrass, bluegrass, and perennial ryegrass in the fall and repeat at 30 to 60 days. While bermudagrass and bluegrass must be well established, perennial ryegrass may be treated about 30 days after seeding. Overseeded bermudagrass with perennial ryegrass has good tolerance to ethofumesate. Use 2 oz of 1.5 lb ai per gallon formulation per 1000 sq ft and repeat at 30 to 60 days. Do not apply after January 1 on bluegrass or bermudagrass.

DISCLAIMER

Trade and brand names are used only for the purpose of information and the Virginia Cooperative Extension Service does not guarantee nor warrant the standard of the product, nor does it imply approval of the product to the exclusion of others which may also be suitable.

KEYS TO PROPER USE OF PESTICIDES

1. Read label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER
USE OF PESTICIDES