

Guide For The Chemical Control Of Turfgrass Diseases And Turfgrass Weeds

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Control Series 76

PROCEDURES FOR COLLECTING SPECIMENS FOR IDENTIFICATION AND RECOMMENDATIONS FOR CONTROL

Diseases. - For general diagnosis, samples should be dug from the margin of the diseased area, and should include both diseased and healthy plants. A cup cutter makes an ideal tool for collecting specimens. If a trowel or shovel is used, the total sample should be 4"-6" in diameter and 4" deep.

If nematode damage is suspected, a soil sample should be taken from just outside the advancing margin of the diseased area. Using either a standard soil tube or a trowel, the samples should include soil to a depth of 4"-6". The collections should be taken from 8-10 locations. All of these samples may be placed in the same container. When taking samples from different major locations, i.e., putting greens, fairways, etc., the material from each location should be labeled and packaged separately.

Weeds. - Collect all parts of the plant (roots, stems, leaves, flowers, and seeds). In many cases it is not possible to obtain a complete specimen. It may be the wrong time of year for flowers to be present or it may be impractical to obtain underground plant parts. Flowers are by far the most helpful part of the plant in identification. However, it is possible to identify many of the

common plants using only vegetative characteristics such as leaf type and arrangement of leaves on the stem.

Immediately after collecting, the material should be placed in a plastic bag and the top fastened with a rubber band or equivalent. This will keep the specimen in good condition during storage. **Do not add water to the bag—this will cause the plant to rot.**

Fresh aquatic plants should be placed between dry paper towels and then placed in a plastic bag. **Do not add water to the bag.** The moisture accompanying the plant at the time it is placed between the towels is sufficient to keep the plant alive. Excess water will cause the plants to disintegrate in a very short time.

After collection, the disease or weed specimens should be taken to your Cooperative Extension Office. The Extension agent at this office has training and experience in weed and disease identification. If your problem is one of the more common ones, he will outline a control program for you. If less common, he will promptly forward the sample to an appropriate Extension specialist at VPI&SU. When this is necessary, 1-2 weeks usually will be required for a reply.

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I. CHEMICAL CONTROL OF TURFGRASS DISEASES

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DISEASE	TURFGRASS	CHEMICAL ^{1/}	RATE 1000 SQ. FT. ^{2/}	SEASON & INTERVAL OF APPLICATION
FAIRY RINGS	All turfgrasses	Methyl bromide fumigation OR Prolonged water soaking of soil		Consult Extension Agent, Agriculture for procedures
FUSARIUM BLIGHT ^{3/} (<i>F. roseum</i>)	Bentgrasses Bluegrasses esp. Merion Kentucky Fescues Ryegrasses	Fungo 50 WP 50% OR Tersan 1991 WP 50% OR Spot Kleen WP 70%	6 oz. 6 oz. 6 oz.	Bentgrasses & Fescues April - September 1 application only Bluegrasses July - August 1 application only
HELMINTHOSPORIUM DISEASES		Select from this list for control of any of the Helminthosporium diseases		
(a) Melting-Out (<i>H. vagans</i>)	Kentucky Bluegrass Ryegrasses Tall fescue	Acti-dione--Thiram OR	2-4 oz.	April - June 7-14 days
(b) Zonate Eyespot (<i>H. giganteum</i>)	Bentgrasses Bluegrasses Bermudagrass Fescues Ryegrasses	Captan WP 50% OR Daconil 2787 WP 75%	4-6 oz. 4 oz.	July - August 7-14 days
(c) Helminthosporium Leaf Spot (<i>H. sorokinianum</i>)	Bentgrasses Bluegrasses Fescues Ryegrasses	OR Dyrene WP 50%	4-6 oz.	July - August 5-7 days
(d) Red Leaf Spot (<i>H. erythrosphilum</i>)	Bentgrasses	OR Fore WP 80%	4 oz.	April - August 5-7 days
(e) Helminthosporium Blight (<i>H. dictyoides</i>)	Fescues Ryegrasses	OR Zineb WP 75%	2-4 oz.	April - June 5-7 days
(f) Brown Blight (<i>H. siccans</i>)	Ryegrasses Fescues			April - June 7-14 days
(g) Leaf Blotch (<i>H. cynodontis</i>)	Bermudagrass			April - June 7-14 days

^{1/} Denotes either chemical, coined name of the material, or representative trade name.

^{2/} Except where indicated, all materials should be applied in 4-5 gal. water per 1000 square feet. Lower rates are to be used in preventive programs; higher rates are to be used in corrective programs.

^{3/} Apply fungicides for Fusarium blight control in 10 gallons of water per 1000 square feet.

DISEASE	TURFGRASS	CHEMICAL	RATE 1000 SQ. FT.	SEASON & INTERVAL OF APPLICATION
PYTHIUM BLIGHT ^{4/} (<i>P. aphanidermatum</i> and <i>P. ultimum</i>)	Bentgrasses Bluegrasses Ryegrass Bermudagrasses Fescues Zoysia	Koban WP 35% OR Terrazole WP 35% OR Tersan SP WP 65% OR Zineb WP 75%	4 oz. 4 oz. 4 oz. 2-4 oz.	July - September 5-7 days
RHIZOCTONIA BROWN PATCH (<i>Rhizoctonia solani</i>)	Bentgrasses Bluegrasses Bermudagrass Fescues Ryegrasses St. Augustinegrass Zoysia	Acti-dione--Thiram OR Daconil 2787 WP 75% OR Dyrene WP 50% OR Fore WP 80%	2-4 oz. 4 oz. 4-6 oz. 4 oz.	July - August 5-7 days
RUST (<i>Puccinia graminis</i> f. <i>sp. agrostis</i>) (<i>Puccinia coronata</i>) (<i>Puccinia zoysae</i>)	Bluegrasses esp. Merion Kentucky Ryegrass, Manhattan Zoysia	Acti-dione--Thiram OR Acti-dione TGF OR Zineb WP 75%	2-4 oz. 2 oz. 2-4 oz.	July - August 7-14 days
STRIPE SMUT ^{4/} (<i>Ustilago striiformis</i>)	Bentgrasses Bluegrasses esp. Merion Kentucky Meadow Fescue Red Top Ryegrass	Fungo 50 WP 50% OR Tersan 1991 WP 50% OR Spot Kleen WP 70%	6 oz. 6 oz. 5 oz.	1 application in October or early spring before grass growth begins
SCLEROTINIA DOLLAR SPOT (<i>S. homoeocarpa</i>)	Bentgrasses Bluegrasses Bermudagrass Ryegrasses Fescues Zoysia	Acti-dione--Thiram OR Bromosan WP 66.7% OR Cleary 3336 WP 50% OR Daconil 2787 WP 75% OR Dyrene WP 50% OR Fungo 50 WP 50% OR Spot Kleen WP 70% OR Tersan 1991 WP 50%	2-4 oz. 4 oz. 2 oz. 2-4 oz. 2 oz. 1 oz. 1 1/2 oz. 1 oz.	Late June - October 5-10 days 3 applications only 3 applications only 5-10 days 5-10 days 5 applications only 4 applications only 5 applications only
SNOW MOLDS Fusarium Patch (<i>F. nivale</i>) Typhula Blight (<i>T. itoana</i>)	Bentgrasses Bluegrasses Bermudagrass Ryegrasses Fescues Zoysia	Dyrene WP 50% OR Tersan SP WP 65%	4-6 oz. 6-9 oz.	Fall to Spring 6 weeks

^{4/} Apply fungicides for control of Pythium blight and stripe smut in 10 gallons of water per 1000 square feet.

DISEASE	TURFGRASS	CHEMICAL	RATE 1000 SQ. FT.	SEASON & INTERVAL OF APPLICATION
NEMATODES	<p>Mix 1 pint of (Nemagon 12.1 EC or Fumazone 86E) with 10 to 15 gallons of water and drench 1000 sq. ft. of turf. Water turf immediately after application to insure penetration of nematicide into soil and to prevent toxic effects. Treat turf in spring and/or in fall when soil temperature is above 55°F. Aerifying turf before nematicide application improves results. This treatment is for professional use only. Do not graze treated areas. Do not feed clippings to livestock. Do not apply to newly seeded areas. <u>Bentgrass</u>: Use 3/4 pint of chemical. CAREFULLY FOLLOW MANUFACTURERS' INSTRUCTIONS.</p> <p>Apply Mocap (5 lbs. of 10% granule) or Nemacur (3 lbs. of 15% granule) uniformly on established turfgrass--immediately apply 1/2 inch water to the turf. Do not use in newly seeded areas. For use only by professional turfmen--do not apply on home lawns. Do not apply more than twice per year. Birds and other wildlife may be killed in treated areas. Mocap - approved for use on Bermuda, Zoysia, St. Augustine, and Centipede grass. <u>Nemacur</u> - approved for use on Bermuda, Centipede, bluegrass and bentgrass. CAREFULLY FOLLOW MANUFACTURERS' INSTRUCTIONS.</p>			

VOLUME MEASURE CONVERSION TABLE FOR USE IN PREPARING SMALL QUANTITIES OF FUNGICIDE SPRAY^{5/}

FUNGICIDE	WEIGHT	TABLESPOONS	OR	CUPS
Actidione PM	1 oz.	4		1/4
	2 oz.	8		1/2
	3 oz.	12		3/4
Acti-dione TGF	1 oz.	3		1/4
Acti-dione--Thiram	4 oz.	22		1 1/3
Benomyl WP 50% (Benlate or Tersan 1991)	2 oz.	11		3/4
	4 oz.	22		1 1/3
Captan	4 oz.	15		1
Captan 50W	6 oz.	23		1 1/2
Orthocide 50W	2 oz.	6		1/3
	4 oz.	12		3/4
	6 oz.	18		1 1/8
Daconil 2787 WP 75%	2 oz.	11		3/4
	4 oz.	22		1 1/3
Dyrene WP 50%	4 oz.	19		1 1/4
	6 oz.	28		1 3/4
Spot Kleen	1 1/2 oz.	3		
	5 oz.	15		2/3
	6 oz.	18		3/4
Fore WP 80%	4 oz.	14		1
	6 oz.	21		1 1/3
Koban	4 oz.	17		1 1/8
Terraclor WP 75%	2 1/4 oz.	8		1/2
	4 1/2 oz.	15		3 1/2
Zineb	2 oz.	9		1/2
Dithane Z-78	4 oz.	18		1 1/8

^{5/} The bulk density of fungicidal formulations varies somewhat. Obviously, the type of diluent used, whether or not the package is fluffed up or allowed to settle, will influence the weight per volume. For this reason, volume measurements are not as accurate as weight measurements. They should be used for preparing small quantities of fungicide spray--and then only if a scale is not available.

II. CHEMICAL CONTROL OF TURFGRASS WEEDS

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BLUEGRASS, KY 31 FESCUE, PERENNIAL RYEGRASS, AND BERMUDAGRASS

Lawn Weed Control CS 45

A. WEEDY GRASSES:

There are several preemergence crabgrass killers available which will do an excellent job of controlling crabgrass and other annual grasses. Goosegrass is more difficult to control than most of the other annual grasses and higher rates are suggested for control.

Preemergence crabgrass killers kill grass seedlings as they germinate. Thus, it is necessary that they be applied in advance of crabgrass germination. Crabgrass usually germinates around April 1 in the mountains and by March 1 in the Piedmont areas.

As a rule, the life of preemergence crabgrass killers in the soil is about 2-3 months. There should be no problem with fall seeding of grass in an area that was treated in the spring.

Postemergent control of annual grasses is considered to be less desirable than preemergent control. The postemergent treatments will usually result in brown, and later bare areas in a lawn.

There is no selective control for most perennial grasses and if control is desired, it must be by physical removal or by non-selective chemicals.

APPLICATION	WEED PROBLEM	CHEMICAL RATE/1000 SQ FT	REMARKS
Preemergent (New Seeding)	Annual grasses: Barnyard-grass, crabgrass, foxtails	siduron 4.5 lb of 2.34% gran or 0.2 lb of 50% WP	Apply at time of seeding. Kills annual weedy grasses, but not bluegrass, Ky 31 fescue or perennial ryegrass. Do not use on bermudagrass.
Preemergent (Established Turf)	Annual grasses: Barnyard-grass, crabgrass, foxtails	benefin 3 lb of 2.5% gran	Apply uniformly in late winter or early spring before crabgrass emergence.
		bensulide 0.5 pt (4 lb/gal) or 1.8 lb of 12 1/2% gran	Same. Do not reseed within 4 months of application. If for some reason turf-grass must be reseeded, charcoal will inactivate this herbicide.
		DCPA 1/3 lb of 75% WP or 5 lb of 5% gran	Apply in the early spring before crabgrass emergence. Flowering of forsythia can be used as a guide for proper timing of application. A second application 8 weeks later will control late germinating crabgrass and goosegrass.
		terbutol 0.28 lb of 80% WP or 4 lb of 5.5% gran	Apply before crabgrass germinates during fall or early spring. Under certain conditions, some slight discoloration of bermudagrass occurs.
		siduron 0.4 lb of 50% WP or 9 lb of 2.34% gran	Same as for terbutol. Use 1/2 rate in conjunction with seeding bluegrass (a preemergence treatment for bluegrass). Common bermudagrass is injured but not sufficiently to control it in a bluegrass or fescue lawn.

APPLICATION	WEED PROBLEM	CHEMICAL RATE/1000 SQ FT	REMARKS
Preemergent (Cont'd.) (Established Turf)	Goosegrass	DCPA 0.4 lb of 75% WP 6 lb of 5% gran	Apply uniformly in late winter or early spring before goosegrass germination. Goosegrass is more difficult to control than crabgrass and treatments are seldom 100% effective. A second application, of DCPA 6 weeks after the first applica- tion will improve control.
		benefin 3 lb of 2.5% gran or terbutol 0.3 lb of 80% WP; 4 lb of 5.5% gran	Apply in late winter or early spring before goosegrass germinates. Terbutol may cause tip chlorosis in bermudagrass. An application of DCPA 6 weeks after the first application will improve control.
	Annual bluegrass	benefin 3 lb of 2.5% gran or bensulide 0.6 pt (4 lb/gal) 2.25 lb of 12 1/2% gran	Apply in late August before annual bluegrass germinates. Do not overseed or reseed for 4 or more months.
Postemergent Crops (Established Turf)	Annual grasses: crabgrass, foxtails, goosegrass	DSMA <u>or</u> CMA <u>or</u> MSMA	Various formulations are available. Start in June when annualgrass is less than 1" tall. At least 3 applications at 7 day intervals are necessary for goosegrass control. Apply when soil moisture is adequate for rapid growth of crabgrass and turf. Some discoloration of turfgrass is to be expected. Follow label instructions for use of individual formulations. Use lower rate when mid- day temperatures are 80°F or higher.
	Dallisgrass, Nutgrass	DSMA 3 oz (70% formulation)	Apply June through September when mid-day temperatures do not exceed 85°F. Two or 3 applications at 10-14 day intervals will be required for control.
	Nutgrass	2,4-D 3 tbsp (4 lb/gal formula- tion)	Apply when actively growing. At least 3 applications at 10-14 day intervals will be required for control.

B. BROADLEAF WEEDS:

The herbicide response table below rates the susceptibility of common lawn weeds to weed killers. Annual weeds live only one year and should be treated in the seedling stage. Winter annuals germinate in the fall and should be controlled at that time. Spring germinating annuals, likewise, need to be treated in the spring. Biennial plants live 2 years and perennials live for 3 years or more. In general, broad-leaf weeds respond best to weed killers when they are most actively growing and in the seedling stage. This is usually in the spring or fall. When equally effective, we prefer the fall applications because of less likelihood of damage to ornamental and garden plants. Application of high rates of weed killer during hot dry conditions may brown desirable grasses.

BROADLEAF WEEDS: (Cont'd)

Most lawns that need treatment contain a variety of weeds which can best be controlled by a combination of ingredients. Many formulations are sold that contain more than one ingredient. It is necessary that label directions on the container be followed to get the proper application rate.

A combination of 2,4-D and silvex is very effective on a wide range of broadleaf weeds. We would consider this to be the best treatment for an average lawn with a variety of weeds. Knotweed, dock, and red sorrel are resistant to 2,4-D and silvex, but are susceptible to dicamba. Dicamba is soil-mobile and should not be used in the root area of shallow rooted trees or shrubs.

Newly seeded areas should not be treated with broadleaf weed killers until enough growth has occurred to allow two mowings.

The broadleaf weed killers recommended for lawns are not particularly toxic to humans, pets, birds or wildlife. They would create a problem only if ingested in large quantities. They are biodegraded by soil micro-organisms and their persistence in the soil would range from 2-4 weeks for 2,4-D, 2-4 months for silvex, and possibly 6-12 months for dicamba.

The chemicals noted below can be used safely at recommended rates on bluegrass, fescue, or common bermudagrass. The bentgrasses are susceptible to injury from 2,4-D or silvex; however, there are formulations containing low rates of 2,4-D in combination with other materials that may be safely used. Fine bermudagrass varieties may be injured by silvex.

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 add 1 gal of water. Directions on the container label should be used as a guide to determine 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.

The relative effectiveness of commonly used herbicides for selected weeds is listed in the following table (on next page), using S = weed susceptible; I = intermediate, good control at times with high rates, sometimes poor, may require more than one treatment; R = resistant weeds in most instances. A = Annual; SA = Summer Annual; WA = Winter Annual; B = Biennial; and P = Perennial. Weeds which are intermediate in response should be given repeat treatment rather than increasing the rate of a single application. It may sometimes be desirable to treat at times other than those listed. When this is necessary, make sure that good growing conditions prevail and contact with desirable plants is prevented.

WEED	CLASSIFICATION	RESPONSE TO HERBICIDES (1b/A)				PREFERRED TIME TO TREAT
		2,4-D (1.5-2.0)	Silvex (1.5-2.0)	Dicamba (0.33-0.5)	Mecoprop (1.5-2.0)	
BEDSTRAW	A	I-R	S-I	S	I	April & May
BINDWEED	P	S	S-I	S	S-I	May & June
BITTERCRESS	WA or B	S	S-I	S	S-I	Oct. & Nov.
BLACK MEDIC	A, B, & P	S	S-I	S	I	April & May
BUTTERCUP	WA, B, & P	S-I	I	S	I	Oct. & Nov.
CARPETWEED	SA	S	I	S	I	May & June
CAT'S EAR (False Dandelion)	P	S-I	S	S	I	Oct. & Nov.
	P	S-I	S	S	I	Oct. & Nov.
CHICKWEED Common	WA	R	S	S	S-I	Oct. & Nov.
Mouseear	P	I-R	S	S	S-I	Oct. & Nov.
CHICORY	P	S	S	S	S	Oct. & Nov.
CINQUEFOIL Common	A	S	S	S	S	May & June
CLOVER Crimson	SA	S	S	S	S	May & June
Hop	SA	I	S	S	S	April & May
White	P	I	S	S	S	Oct. & Nov.
CRANESBILL	WA or B	S	S-I	S	S-I	Oct. & Nov.
DAISY Oxeye	P	I	I	I	I	Oct. & Nov. or May
DANDELION	P	S	S	S	S	Oct. & Nov.
DOCK	P	I	I-R	S	I-R	Feb. - April
DOGFENNEL	P	I	S	S	I	Oct. & Nov. or April
GARLIC Wild	P	S-I	R	S-I	R	Oct. - Nov. & Feb. - March
GROUND IVY	P	I-R	S-I	S-I	I	April - May
HAWKWEED	P	S-I	R	S-I	R	Aug. & Sept.
HEALALL	P	S	I	S-I	R	Oct. & Nov.
HENBIT	WA	I	S	S	I	Oct. & Nov.
HONEYSUCKLE	P	S-I	S-I	S	I	May & June
HORSENETTLE	P	I-R	I	I	R	May & June
KNAPWEED Spotted	B	I	S-I	S	I	Oct. & Nov.
KNAWEL (German Moss)	WA	R	S	S	I	Oct. & Nov.
KNOTWEED	SA	R	I	S	I	March - April

WEED	CLASSIFICATION	RESPONSE TO HERBICIDES (lb/A)				PREFERRED TIME TO TREAT
		2,4-D (1.5-2.0)	Silvex (1.5-2.0)	Dicamba (0.33-0.5)	Mecoprop (1.5-2.0)	
LAMBSQUARTERS	SA	S	S	S	S	April & May
LESPEDEZA	SA	I-R	S	S	S	April & May
MUGWORT	P	I	I-R	S-I	I-R	March
MUSTARDS	WA & B	S	S-I	S	I	Oct. & Nov.
NUTSEDGE	P	I	R	R	R	June or when active growth occurs
ONION, Wild	P	I	R	S-I	R	Oct. - Nov. & Feb. - March
ORNAMENTAL PLANTS	P	S-I	S-I	S	S-I	Most likely to injure from April to June
OXALIS	P	I	S	S	S	Oct. & Nov.
PENNYCRESS	A	S	S-I	S	I	Oct. & Nov.
PEPPERWEED	WA or B	S	S-I	S	S-I	Oct. & Nov.
PIGWEEED	SA	S	S	S	S	April & May
PLANTAINS	P	S	I	I-R	I-R	Oct. & Nov.
POISON IVY	P	I	S	S-I	R	June
PONY FOOT	P	S	I	S-I	I	Oct. & Nov.
POORJOE (<i>Diodia</i>)	A	S-I	S-I	-	I	May & June
PROSTRATE SPURGE	SA	I	I	S	I	April - May
PURSLANE	SA	I	S-I	S	R	May & June
RED SORREL	P	R	I	S	S	Oct. & Nov.
SHEPHERDSPURSE	WA	S	S	S	S-I	Oct. & Nov.
SMARTWEED	SA	I-R	I	S	I-R	April & May
SOWTHISTLE	WA	S	I	S	I	Oct. & Nov.
SPEEDWELL	SA or WA	I-R	I-R	I-R	I-R	April
SPOTTED SPURGE	SA	I-R	I	S-I	S-I	May & June
THISTLE						
Bull	B	S-I	S-I	S	I	Oct. & Nov.
Canada	P	I	I	S	I	Oct. & Nov.
Curl	B or WA	S	I	S	I	April
Musk	B	S	I	S	I	April
VEGETABLES	A	S	S	S	S	Most likely to injure April to June
VIOLET	P	I-R	S	S-I	I-R	April

WEED	CLASSIFICATION	RESPONSE TO HERBICIDES (lb/A)				PREFERRED TIME TO TREAT
		2,4-D (1.5-2.0)	Silvex (1.5-2.0)	Dicamba (0.33-0.5)	Mecoprop (1.5-2.0)	
WILD CARROT	B	S	I	S	I	Oct. & Nov.
WILD STRAWBERRY	P	R	I	S-I	R	Oct. & Nov.
WOODSORREL	P or SA	R	S	I	R	April & May
YARROW	P	I	I-R	S	I-R	Oct. & Nov.
YELLOW ROCKET	B or P	S-I	I	S-I	I	Oct. & Nov.

ZOYSIA

V.P.I. and S.U. does not conduct an active research program on zoysia. The following materials have label clearance and specifically mention that they can be safely used on zoysia. These materials have been thoroughly tested at V.P.I. and S.U. on the more common grass varieties and we feel that they can be safely used on zoysia by following directions on the container label.

Preemergent Grass Control

bensulide (Betasan)
benefin (Balan)
siduron (Tupersan)

Postemergent Grass Control

DSMA (Chipco Crab Kleen)
CMA (Weedone Crabgrass Killer)

Broadleaf Weed Control

2,4-D + MCPP (Scott's Bonus)
Rhodia Turf-Kleen
silvex (Weedone Chickweed Control)

NONSELECTIVE CONTROL OF PERENNIAL GRASSES (Fescue, nimblewill, orchardgrass, quackgrass, timothy)

Undesirable patches or clumps of perennial grasses can be treated with dalapon (Dowpon) at the rate of 10 tablespoons per gallon of water. Lightly wet the foliage of the undesirable grass in the spring or summer when it is actively growing. Repeat 7 to 10 days later until complete control is obtained. Usually 2 or 3 applications are required. Dalapon is biodegraded in the soil and it is safe to reseed or resod the treated area about 30 days after the last application.

WEED CONTROL IN DRIVEWAYS, FENCE LINES AND PARKING AREAS

There are many good soil sterilants on the market that will give long term control of weeds. These are discussed in the non-selective section of this guide. These materials are very powerful weed killers and not designed for a homegrounds situation. Many of them have the capability of killing large trees which have roots extending below the treated area.

Dalapon mentioned above can be used to kill grassy weeds in a driveway, parking area or under a fence. Amizine (amitrole + simazine) is a very useful product in these areas. It does not move down in the soil sufficiently to kill trees. Amizine is sold by farm chemical suppliers and not readily available at lawn and garden stores.

GOLF COURSE PUTTING GREENS

Bentgrass or Bermudagrass

WEED PROBLEM	CHEMICAL RATE/1000 SQ FT	REMARKS
Preemergent Control of Annual Grasses	bensulide 0.6 pt (4 lb/gal formulation or 2.1 lb of 12.5% gran)	Apply uniformly in the late winter or early spring before crabgrass emergence. August or September application is used for annual bluegrass control.
	DCPA 1/3 lb of 75W or 5 lb of 5%	Do not use on bentgrass. Apply in the late winter or early spring before crabgrass germinates.
Postemergent Control of Annual Grasses	DSMA 1 oz of 70% formulation	Follow label directions. Discoloration of grass should be expected. Use only when mid-day temperatures are below 90°F. Goosegrass control will require 2-3 applications at 7 day intervals.
Postemergent Control of Broadleaf Weeds	dicamba 1-2 tsp (4 lb/gal formulation)	Margin to tolerance is narrow. Excessive rates will kill grass. A teaspoon is 1/6 fluid ounce. Do not try to spot treat on green or excessive rates will occur. Start spraying on apron and move across the green. Best to put on 1/2 rate in one direction and retreat with remaining 1/2 at right angles.
	mecoprop (MCP) 1.5-2 oz of 2 lb/gal formulation	Seaside, Arlington and Congressional bents may be injured.
	2,4-D + MCP + dicamba 0.5 oz of Trex-San	A commercial mixture with a reduced rate of dicamba which gives a good spectrum of weed control and increased margin of safety over dicamba alone. Do not over apply. Slight yellowing may occur temporarily. Do not irrigate within 24 hours after application.

GOLF COURSE FAIRWAYS

Fairway weed control can be accomplished with the same weed killers listed in the first part of the turf section. The same rates and remarks will apply.

GOLF COURSE SAND TRAPS

Weeds in sand traps present considerable problems in golf course management. Stauffer Chemical Company now has label clearance for use of Eptam 5G in sand traps. All weed growth must be removed before application. Eptam must be raked into the sand to a 2 to 3 inch depth immediately after application. It will not injure greens when blasted or tracked on the turf by players.

Follow directions on the container label for correct rate and method of application.

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 the 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.