

Guide to Controlling Weeds in Cool Season Turf*

Managing lawn weeds is a concern for many Maryland homeowners. When faced with a weed problem, homeowners need to look closely at the entire lawn care picture. Studies show that weeds are not prevalent in a dense, healthy, vigorously growing lawn. Care of your lawn should be your first priority. Remember: weeds are opportunistic. Weed seeds germinate best in thin, weak stands of grass. Millions of weed seeds may exist in the soil. Most of these seeds do not germinate or are “eaten” by soil insects and microorganisms. However, when conditions are right for germination, a weed infestation can begin.

Before Deciding on Herbicide Use

Herbicides are an important tool for weed control, but should not be relied upon solely for weed elimination. Follow these steps before deciding whether or not an herbicide is even necessary and which one is the best to use.

- 1) Assess the amount of weeds in your lawn. If you have a low population of certain broadleaf weeds, such as dandelions or purslane, hand pulling may be the only means of control necessary.
- 2) If your lawn is otherwise healthy, learn to tolerate a certain amount of weeds. Even in the best-managed lawns a number of weeds will appear.
- 3) Consider using an herbicide only for invasive weeds such as ground ivy, clover, wild violet, and grassy weeds.
- 4) It is important to identify the weeds. This will help in the selection of the appropriate herbicide and also will determine the timing of the herbicide application.
- 5) Try to determine how the weed was introduced into your yard and the conditions that favor it.
- 6) Look at cultural practices, along with poor growing conditions, as the possible reason for weed encroachment.

Cultural Practices That Encourage A Healthy Lawn

- **Maintain proper soil pH** – A soil test should be taken every 3-5 years to determine pH. Soil pH should be in the 6.0 to 6.8 range for optimal turf growth. Apply lime according to soil test results to achieve the desired pH.
- **Fertilize at the proper time** – Fall fertilization is recommended to encourage root development. If turf lacks dark green color and is weak and thin, a light late-spring application of fertilizer is also beneficial. Fertilizer should not be applied in the summer when turf is dormant and possibly under stress from hot, dry conditions. Do not bag grass clippings. Clippings that decompose on the lawn will not cause thatch to develop, but will recycle nutrients. Less fertilizer will need to be applied to your lawn.
- **Irrigate only if necessary** – Watering lawns is usually prohibited during a prolonged drought. Allow established tall fescue lawns to go dormant during hot, dry weather in the summer. The lawn will recover when rainfall and cooler temperatures return. Only newly seeded areas and lawns less than two years old should be irrigated.
- **Mow at proper height** – Close mowing weakens turf by removing too much leaf surface. Try to mow frequently enough that you remove no more than 1/3 of the blade at one mowing.

MOWING GUIDE

	Spring & Summer	Fall & Winter
Tall fescue	2 ½ - 3 ½ in.	2 ½ in.
Kentucky bluegrass	2 ½ - 3 in.	2 - 2 ½ in.
Fine fescue	2 ½ - 3 ½ in.	2 ½ in.

**Cool season turf grows actively in the spring and fall and often goes dormant during droughty summer periods. Turf greens-up again when rainfall and cooler temperatures return. Examples are turf-type tall fescue, Kentucky bluegrass, fine fescue, and perennial ryegrass. Bermudagrass and zoysiagrass are warm season turf grasses.*

- **Amend poor soil conditions**
 - aerate compacted soil
 - add compost to poor soil
 - correct drainage on poorly drained sites
- **Use the proper seed for your site conditions** – For sunny sites, plant turf-type tall fescue. In shade, plant fine fescue such as chewings fescue, creeping red fescue, or hard fescue.
- **Buy quality seed** – When buying seed, choose cultivars recommended for Maryland lawns. Refer to Agronomy Mimeo #77, *Turfgrass Cultivar Recommendations For Maryland*. Check the grass seed label for the percentage of weed seeds. Percentage by weight of weed seeds should be less than 0.1%. Higher percentages indicate a poor quality grass seed. Avoid buying seed that contains any percentage of noxious weeds such as *Cirsium arvense* L. (Canada thistle), *Poa annua* L. (Annual bluegrass), or *Dactylis glomerata* L. (Orchardgrass.)
- **Overseed to fill in thin or bare spots** – Overseed in late August through early fall. The next best time is in early spring.
- **Remove thatch** – Thatch prevents water, air, and nutrients from reaching the soil. Thatch buildup tends to be more of a problem on Kentucky bluegrass and fine fescue lawns. If thatch is present, you will notice a brown layer of non-decomposed organic matter between the soil and the grass. If this layer is thicker than ½ inch, thatch removal is recommended. Thatch should be removed in the fall, while the turf is actively growing. Rent a vertical mower or core aerator for this task.

Weeds As Indicators of Poor Growing Conditions

Weeds can indicate soil, site, and cultural practices that need to be changed. For example, ground ivy is often found in shady areas where shade-intolerant turfgrass has begun to thin out and decline. Annual bluegrass thrives under adverse growing conditions such as wet or shady areas, compacted soil, or in turf that receives close frequent mowing. Many weeds, such as broadleaf plantain, goosegrass, prostrate knotweed, and prostrate spurge, will readily grow in compacted soil where turfgrass will not grow. Yarrow, prostrate spurge, prostrate knotweed, black medic, and goosegrass will adapt to droughty soils. Nutsedge, bentgrass, and roughstalk bluegrass prefer wet soils. Chickweed and crabgrass are commonly found in lawns that are mowed too short.

Soil fertility can also affect the types of weeds in your lawn. Plantain, black medic, lespedeza, nimblewill, chicory, clover and common speedwell are found in lawns grown with infrequent applications of nitrogen fertilizer. Annual bluegrass and chickweed are found in lawns with high levels of nitrogen. The presence of red sorrel can be an indication of acidic, infertile soil.

Types of Herbicides

• Selective Herbicides

Many *pre-emergence* and *post-emergence* herbicides are selective herbicides. This means when used according to label directions, they target specific weeds only, with little or no damage to the turf.

- Pre-emergence* herbicides are applied prior to the germination of weeds. They are commonly used to control annual grass weeds, such as crabgrass. Pre-emergence herbicides should be directed towards the soil. The chemical forms a barrier in the soil, which kills weed seeds as they germinate. Pre-emergence herbicides need to be watered in soon after they are applied. Caution must be used if you intend to overseed that season. In most cases you cannot overseed and apply a pre-emergence herbicide at the same time. The only exception is the herbicide Siduron (Tupersan®). Always read and follow the product label carefully.
- Post-emergence* herbicides are used to control actively growing grass and broadleaf weeds. The foliage of the weeds is targeted. To be effective the chemical needs to be absorbed into the plant itself and moved down to the root system. Mowing the grass should be avoided a few days before and after the application of the herbicide. Post-emergence herbicides should not be used if rain is in the immediate forecast. They are not watered in, because this will wash the product off the leaves. Fall or spring are the best times to target perennial broadleaf weeds, such as ground ivy, white clover, wild violets, and wild garlic.

• Non-Selective Herbicides

Non-selective herbicides kill all vegetation contacted by the herbicide and must be applied to vegetation that is actively growing. Some contain the chemical glyphosate (Round-up®, Kleeraway® or Kleen-up®). Glyphosate is recommended when undertaking complete lawn renovation. Renovation should be considered when your lawn consists of 50% weeds or your lawn is invaded by perennial grass weeds such as nimblewill or Bermudagrass. The best time to renovate your lawn is late summer or early fall (mid-August through September.) Other non-selective herbicides are available such as glufosinate (Finale®) or (Scythe®) which contains pelargonic acid but are not as effective for controlling perennial weeds.

List of Weeds

Weeds fall into two main categories: broadleaf and grassy. Below are descriptions and examples of both types, plus control options.

• Broadleaf Weeds

- A. Summer Annual Broadleaf Weeds – Seeds begin to germinate as soils begin to warm up in early spring and continue to germinate throughout the growing season. Annual weeds complete their entire life cycle in a single growing season.
1. Black medic*
 2. Carpetweed
 3. Knotweed
 4. Lespedeza
 5. Oxalis (yellow wood sorrel)**
 6. Prostrate spurge
 7. Purslane
 8. Mallow***

*can also be biennial or perennial

**can also be perennial

***can also be a biennial

Control – Implement cultural practices that encourage a healthy lawn. Hand pull prior to flowering if weeds are thinly distributed in the lawn. Use a selective *post-emergence* broadleaf herbicide labeled for the identified weed when the weeds are actively growing.

- B. Winter Annual Broadleaf Weeds– Seeds germinate from late summer through fall. Weeds over winter and continue to grow in early spring.
1. Common chickweed
 2. Corn speedwell (Veronica)*
 3. Dead nettle
 4. Henbit
 5. Shepherd's purse

* difficult to control

Control – Implement cultural practices that encourage a healthy lawn. Hand pull prior to flowering. Use a selective *post-emergence* broadleaf herbicide labeled for the identified weed when the weeds are actively growing. A *pre-emergence* herbicide, such as Isoxaben marketed under the tradename Gallery™, can be applied in the fall (mid to late October.) Gallery can be very expensive.

- C. Biennial Broadleaf Weeds – These weeds complete their life cycle in 2 years. The first year's growth is vegetative, and the second year they flower and produce seeds. They are treated as perennial broadleaf weeds for control purposes.
1. Wild carrot
 2. Bull thistle*

*Difficult to control. May need repeated applications of selective *post-emergence* herbicide. For persistent weeds, an early fall application of *post-emergence* herbicide is effective.

Control – Implement cultural practices that encourage a healthy lawn. Hand pull prior to flowering. Do not hand pull thistle because new plants will form from pieces of root that remain in the soil. Use a selective *post-emergence* broadleaf herbicide labeled for the identified weed when the weeds are actively growing.

- D. Perennial Broadleaf Weeds – Perennials are persistent from year to year. They reproduce by seed and also by vegetative means. This is the largest group of weeds. They range from weeds that are easy to eliminate, to some of the most difficult to control.
1. Broadleaf and curly dock
 2. Broadleaf and buckhorn plantain*
 3. Canada thistle*
 4. Common cinquefoil
 5. Creeping oxalis
 6. Creeping speedwell (Veronica)
 7. Chicory
 8. Dandelion
 9. Ground ivy or creeping Charlie*
 10. Indian strawberry*
 11. Mouse-ear chickweed
 12. Sheep or red sorrel
 13. White clover*
 14. Wild garlic and wild onion**
 15. Wild strawberry*
 16. Wild violet***
 17. Yarrow

* difficult to control. May need repeated applications (in May and September) of selective *post-emergence* broadleaf herbicide. Early fall is a good time to control broadleaf weeds.

** sometimes crushing the foliage before applying herbicide provides better control.

***difficult to control. Triclopyr + Clopyralid, sold under the tradename Confront™, is labeled for control of wild violet. This product is available to commercial applicators, such as lawn care companies and landscapers.

Control – Implement cultural practices that encourage a healthy lawn. Hand pull prior to flowering (although when removing a weed with a taproot such as dandelions care must be taken that the majority of the root is removed) . Use a selective *post-emergence* broadleaf herbicide labeled for the identified weed when the weeds are actively growing. For the most persistent perennial broadleaf weeds, an early fall application of herbicide can be effective.

• Grassy Weeds

A. Summer Annual Grasses – Seed germination begins in early to mid-spring, when soil temperatures have risen to 58° - 60° F. for 4 to 5 days. This occurs when air temperatures are 65° - 70° F. for 4 to 5 consecutive days. In Central Maryland, this is typically mid-March through mid-April. Seeds continue to germinate in the summer, and plants are killed by the first frost.

1. Crabgrass
2. Foxtail
3. Goosegrass

Control – Apply *pre-emergence* herbicides in mid-March on the Eastern Shore, late March in Central Maryland and early April in Western Maryland. For uniform coverage, apply half the recommended rate of herbicide in one direction and the remainder in the opposite direction. When controlling goosegrass, apply the herbicide 3-4 weeks after the recommended date for *pre-emergence* control of crabgrass, because goosegrass germinates later than crabgrass. If weeds have germinated and matured, *post-emergence* herbicides labeled to kill crabgrass are available on the market.

For summer-long crabgrass control: Split the recommended rate of herbicide into two applications. Apply half mid-March through April 1, then apply the second half in mid-May. A split application will help to control two flushes of crabgrass. Crabgrass is typically finished germinating in July. Refer to Agronomy Mimeo #85, *Herbicides For Crabgrass And Goosegrass Control in Turf*.

B. Winter Annual Grasses – Seeds germinate in the fall. Seedlings survive the winter and begin to grow actively in the spring. Grows in dense patches that appear light green in color. When warm weather sets in, plants turn brown and die.

1. Annual Bluegrass (*Poa annua* L)

Control – Mow turf to proper height at proper intervals, correct soil compaction, address moisture problems, and reduce nitrogen fertilizer rates. For a severe infestation, apply a *pre-emergence* herbicide labeled for annual bluegrass prior to seed germination in late summer or fall (if not planning to overseed at that time.)

C. Perennial Grass Weeds – These weeds are very difficult to control, and in certain instances complete lawn renovation is necessary.

1. Bermudagrass or wiregrass
2. Creeping bentgrass
3. Dallisgrass*
4. Nimblewill

5. Orchardgrass
6. Quackgrass
7. Roughstalk bluegrass
8. Tall fescue

*Certain Methanearsonates that are labeled to kill crabgrass after emergence are also labeled for Dallisgrass.

Control – Selective herbicides with the ability to control perennial grass weeds in cool season turf are very limited. Fenoxaprop (Acclaim®) and products with the active ingredient Fluazifop are recommended for suppression and control of Bermudagrass, but are not readily available to the homeowner. Such products are not commonly sold in hardware stores or garden centers, are expensive, and come in quantities that would be too large for a homeowner to use. To control perennial grass weeds, consider hiring a lawn care company or landscaper, that would have access to these chemicals. When discussing herbicide treatment with a professional be specific about the weeds you want controlled.

Homeowners may use a non-selective herbicide to either spot treat the problem areas or, if necessary, undertake complete lawn renovation. Refer to publication #HG37, *Renovation of Turf* and Agronomy Mimeo #73, *Perennial Grass Weeds and their Control in Turf*. This process should be started in early August, which allows time to retreat the area if a second or third application of herbicide is necessary before sowing grass seed. Bermudagrass and quackgrass sometimes require two or more applications of herbicide. Seeding can be done after the treated areas have turned completely brown and no new growth of weeds has appeared. Control for perennial grass weeds should begin when they are first noticed, because they become extremely difficult to eliminate once established.

D. Sedge- This perennial is neither a grass nor a broadleaf weed. Distinct characteristics include a triangular stem and yellow green color.

1. Yellow nutsedge or nutgrass

Control – Nutsedge is an indication of poor drainage. Hand pulling is not practical because pieces of rhizome and nutlets that are left will form new plants. Bentazon (Basagran®) is labeled for control. Certain post-emergence herbicides containing MSMA (see page 6) are also labeled for nutsedge.

Weed Identification

To aid in identifying a weed, log onto our website at www.hgic.umd.edu. Click on *Plant Diagnostics* then *Lawns*. Pictures of common lawn weeds are provided. Or click on *Links*, and go to *Lawn Care* and *Weeds*. You will find a number of websites that will help you with weed identification. You can also contact the Home and Garden Information Center 1-800-342-2507 within state, or 410-531-1757 out of state, to speak to a Horticultural Consultant from Monday-Friday 8:00a.m. to 1:00p.m. for assistance.

Overview of Herbicides

Always read the label directions before applying an herbicide. Improper use can result in poor weed control, damage to your lawn and ornamental plants as well as to the environment. It is a violation of state and federal law to use any product in a manner that does not conform to the information on the label.

• Important Information You Will Find on Product Labels

- ❖ Direction for use – Rates and when to apply
- ❖ Type of turfgrass on which the herbicide can be used
- ❖ Weeds controlled
- ❖ Precautionary statement – Hazards to humans and domestic animals
- ❖ Environmental hazards
- ❖ Storage and disposal
- ❖ Safety instructions
- ❖ Signal words – Caution (low toxicity), warning (moderate toxicity) or danger (high toxicity). If there is no signal word, the product is considered harmless.
- ❖ Active ingredients – What chemicals control the weeds
- ❖ Inert ingredients – What chemicals serve other purposes, such as being a carrier or dissolving the active ingredient
- ❖ Waiting period before reseeding
- ❖ Manufacturer's address

Designate one sprayer for herbicides only. Damage may occur to plants if the same sprayer is used to apply insecticides or fungicides as well as herbicides.

• Examples of Available Herbicides

A. Selective *Post-emergence* Broadleaf Herbicides

Products are available in liquid concentrates, granular, or ready-to-use spray bottles. The following is a list of the most common chemicals found in broadleaf weed herbicides:

1. 2,4-D – On the market for the longest time. This plant growth regulator controls a wide range of broadleaf weeds. Effective against dandelions.
2. MCPP (Mecoprop) – Used to control chickweed and clover.
3. Dicamba – Used to control a variety of weeds, such as knotweed, clover, chickweed, spotted spurge, clover, and purslane. Will not injure turfgrass, but can damage

ornamental trees and shrubs when sprayed over areas where roots grow. Use product according to label directions.

4. Triclopyr – Sometimes formulated with 2,4-D, which allows for a greater number of broadleaf weeds to be controlled. Can help to control some of the hard-to-kill weeds, such as wild violet.

Combinations of these chemicals are found in a number of granular and liquid herbicide formulations. It is best to use a combination product when controlling some of the more difficult weeds. An example is 2,4-D, MCPP + Dicamba, which is effective against a large number of difficult weeds to control. For homeowners that want to avoid using Dicamba, 2,4-D+MCPP is available.

Selective *Post-emergence* Broadleaf Herbicides

<u>Common Name</u>	<u>Trade name</u>
2,4-D	Many
MCPP	Many
Dicamba	Banvel
2,4-D, MCPP+Dicamba	Trimec® Lawn Weed Killer, Dragon Lawn Weed, Killer, VigoroLawn Weed Control, many others
2,4-D+MCPP	Ortho Weed-Be-Gon® Weed Killer, others

B. Selective *Pre-emergence* herbicides

Used to control summer annual grass weeds. Except for Siduron, these should be applied to established turf only.

Selective *Pre-emergence* herbicide

<u>Common Name</u>	<u>Tradename</u>
Benefin	Balan®
Benefin + trifluralin	Team®
Dithiopyr	Dimension®*, others
Oxadiazon	Chipco Ronstar G®**, others
Pendimethalin	Scott's Halts®***, Lesco Pre-M®, others
Prodiamine	Barricade®, others
Siduron	Tupersan®****

- * Provides post-emergence control of crabgrass in its early stages of development.
- ** Most effective preemergent for controlling goosegrass.
- *** Does not contain fertilizer.
- **** May be applied at time of seeding lawn. Does not provide good control for goosegrass. Not recommended for Bermudagrass.

C. Selective *Post-emergence* Herbicides

Used to control summer, annual grass weeds.

1. Methanearsonates (DSMA and MSMA)- Many products are available on the market that contains these chemicals. Typically they are used to control actively growing crabgrass. Some products are also labeled for nutsedge and dallisgrass. Repeat applications may be necessary. Discoloration of lawns is common. Do not apply in extreme heat or droughty conditions.

D. Combination Herbicides

Also on the market are products that contain chemicals to treat both broadleaf weeds and grassy weeds at the same time. Some products are a combination of 2,4-D, MCP, and Dicamba (to control the broadleaf weeds) and MSMA (to control the grassy weeds.) An example is Bayer Advanced Lawn All-in-One Weed Killer for Lawns®.

over-fertilizing can occur. When possible, buy products that contain an herbicide only. There are a few exceptions however; some of the *pre-emergence* granular herbicides come on fertilizer carriers only.

Liquid vs. Granular Herbicides

Many herbicides are available in liquid formulations. They are formulated to be mixed with water and applied with a hose-end or pump sprayer or come pre-mixed and ready-to-use (RTU.) Liquid herbicides allow you to target weeds only. This is known as *spot treatment*. The benefit of spot treatment is that you do not have to treat your entire lawn with an herbicide. Do not apply a liquid herbicide on a windy day. The chemical may drift onto ornamental plants and cause damage. Granular herbicides are applied with a drop spreader, and therefore may be easier for a homeowner to apply. Granular herbicides are best applied when the grass is wet, so the chemical will adhere to the foliage.

You should avoid applying any types of herbicides on your lawn during the summer when cool season grasses are dormant and perhaps showing signs of drought stress.

Weed and Feed Products

Weed and feed products contain both herbicides and fertilizers. These are not the best choices for weed control, because you may fertilize and apply herbicide at inappropriate times. Also

General Guidelines to Ensure Herbicide Effectiveness

Post-emergence

- ✓ Check product label to verify that the weed you wish to control is listed.
- ✓ Carefully read and follow label directions.
- ✓ Do not mow lawn a few days prior to or immediately after application of product.
- ✓ Granular herbicide should be applied to moist foliage.
- ✓ Do not apply herbicide if rain is in the forecast for the next 24 hours.
- ✓ Do not irrigate lawn after herbicide is applied.

Pre-emergence

- ✓ Check product label to verify that the weed you wish to control is listed.
- ✓ Carefully read and follow label directions.
- ✓ Irrigate lawn within two days after application if it has not rained.
- ✓ Mow lawn before application of herbicide.
- ✓ Proper timing of herbicide application is essential.

At the time of printing, the products listed in this publication were registered for use in Maryland. However, recommendations for the use of pesticides are subject to change due to revisions in product labeling. In some cases, the chemicals change even though the product name remains the same.

Organic Herbicides

A. Corn gluten has been marketed to homeowners looking for an organic control for weeds. While the advertisements make the product sound very promising, corn gluten is not effective against mature weeds and provides only limited pre-emergence control for a few weed species. Another downside is the cost. At the rates required for weed suppression, this product can be very expensive. Homeowners looking for an alternative to chemical herbicides should be aware of the limitations of corn gluten.

B. Soap-based herbicides are non-selective herbicides. The words *potassium salts of fatty acids* will be listed under the active ingredients on the label. They are formulated to break down the waxy covering on leaves, causing the foliage to burn. The herbicide does not become absorbed into the plant and works by contact only. The root system of the plant is not affected. Therefore, only limited control of weeds is achieved. These products work better on younger weeds without developed root systems. Soap-based herbicides control perennial weeds poorly.

C. The USDA has been doing research on using vinegar for weed control. Vinegar is a non-selective herbicide. It can be sprayed directly on weeds to spot treat them in your lawn. When applying, avoid runoff so that the vinegar does not harm your turf.

Organic Weed Control Methods

- ✓ Hand pulling and cultivation
- ✓ Implementing correct cultural practices
- ✓ Regular mowing at proper height
- ✓ Vinegar

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*Tradenames mentioned in this publication are for product identification purposes only.
No endorsement is intended.*

**USE PESTICIDES AND HERBICIDES WITH CARE.
READ LABEL DIRECTIONS. FOLLOW ALL SAFETY PRECAUTIONS.**

PROTECT THE BAY. USE PESTICIDES AND FERTILIZERS WISELY.

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