BROADLEAF WEED CONTROL IN ESTABLISHED LAWNS

University of Maryland
Turfgrass Technical Update
TT - 49 July 2005

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The presence of weeds in a home lawn mar the appearance of turf, but more importantly they compete with the desired turfgrass for water, nutrients, light and space. Lack of control of these weeds often results in a deterioration of the turfgrass stand as the number of weeds increase. Total lawn renovation eventually may be required should weeds be allowed to dominate the stand.

Control of weeds is not by itself enough because chronically severe weed problems often are symptomatic of a more basic cultural or soil problem. If these problems persist, weeds also will be a continuous problem. Thus, weed control not only includes removal of existing weeds, but also taking corrective management measures for the factors causing the poor lawn so that weeds will not become a recurring problem. Even when employing the best possible management practices, however, some weeds eventually will encroach into any turf.

Common weeds, clockwise from upper left: Dandelion, Ground Ivy, Indian Mockstrawberry, Common Violet

Principle Causes of Poor Lawns

Inspection of lawns throughout the state has shown that one or more of the following factors are typically responsible for poor lawns that result in severe weed problems:

1. **Poor Quality Seed**: Many lawn grass seed mixtures sold in Maryland contain types of grasses that are not well adapted to Maryland and/or may contain excessive weed seed. When seeding lawns, use cultivars recommended in Maryland (see Turfgrass Technical Update **TT-77**, "Turfgrass Cultivar Recommendations For Maryland"). Buy certified seed to ensure that you obtain a quality product.

2. **Close Mowing**: Low mowing greatly favors weed invasion and competition with the desired turfgrass. Insufficient leaf area for the development of a vigorous root system also occurs when the lawn is mowed too closely or frequently. Kentucky bluegrass lawns should be maintained at a height of 2 to 2½ inches, whereas tall fescue and fine-leaf fescue lawns should be maintained at a height of 3 to 3½ inches. The lawn should not be allowed to get taller than 1/3 the desired height before re-mowing. For example, if the desired height is 2 inches the lawn should be mowed before it exceeds 3 inches in height.

3. **Too Little or Too Much Fertilizer and Lime**: A variety of problems arise from incorrect fertilization and liming. Weeds are favored more than turf when fertilizer is applied at an improper time, particularly in the summer. Too little fertilizer or lime, results in poor turf density and vigor, which decreases competition with weeds. Too much nitrogen fertilizer can increase drought and disease injury, which also results in decreased competition with weeds. Soil testing no longer is available at the University of Maryland, however, contact your County Cooperative Extension Office to learn how to obtain a proper soil sample and where it can be sent for testing.

KEY POINTS

Growing a healthy and dense lawn is the best defense against unwanted weeds.

Controlling weeds is not enough to ensure a healthy lawn because weeds often are indicators of other serious problems.

Using mixtures that contain two or three different herbicides improves both the spectrum and level of weed control.

Be careful when mixing herbicide mixtures, and follow the directions completely.

4. **Improper Watering**: Frequent and shallow watering usually does more harm than good in maintaining a lawn. It increases chances for disease, restricts the depth of rooting, and encourages germination of weed seed. When water is needed, apply with a sprinkler and wet the soil to a 4 to 6 inch depth. Never apply water so fast that it stands on or runs-off the surface. See **TT-88**, "Irrigation and Water Conservation on Home Lawns" for information.

5. **Droughty or Poorly Drained Soils**: These soils may not be suited to growing a dense turf. Certain ornamentals or ground covers may be better adapted. However, tall fescue is the preferred species for use in these situations.

6. **Lack of Sunshine**: Many turfgrass species will not tolerate shade, and even shade tolerant grasses grow slowly with insufficient light. If the area receives less than three hours of direct sunlight each day, then the use of certain ornamental ground covers should be considered. Fine-leaf fescues (e.g., creeping red, hard and sheep fescue) are the best turfgrass species for use in shaded environments. Despite its excellent shade tolerance, roughstalk bluegrass should not be used as a lawn grass in Maryland. Roughstalk bluegrass is highly invasive and it will spread to sunny areas where it turns brown in the summer. Eventually, it will spread to neighboring lawns.

7. **Too Much Traffic**: Heavy use of lawn areas or concentrated traffic across one section, particularly when the soil is wet, compacts the soil and weakens the turf. Under these conditions, weeds will be more competitive. Tall fescue is the best lawn grass for heavy traffic areas.

8. **Insect and Disease Damage**: Decreased vigor and thinning of lawns will occur where insect pests and/or diseases are left unchecked. As a result, weeds will rapidly invade damaged areas of the lawn. Tall fescue has fewer insect pest and disease problems, when compared to Kentucky bluegrass and perennial ryegrass.

Cultural Control of Broadleaf Weeds

The numbers and types of weeds found in lawns are greatly influenced by management and cultural practices. Close mowing and too little nitrogen favor nearly all lawn weeds, particularly white clover, spurge, plantains, yellow woodsorrel and dandelion. Poorly drained areas favor weeds such as ground ivy, chickweeds and yellow nutsedge, while compacted sites favor knotweed.

Correcting improper management practices so that a dense, vigorous turf develops is the best and most lasting method for minimizing broadleaf weed problems. Of particular importance are proper fertilization, mowing, and watering. Although chemical control of most weeds is possible with the proper use of a labeled herbicide, weeds become a recurring problem if poor management and cultural practices are continued. A few broadleaf weed species cannot be controlled satisfactorily by herbicides, so proper management is necessary to reduce the opportunity for their establishment and spread. **Herbicides should be considered an aid, but not a cure for broadleaf weed problems in lawns.** Once large numbers of weeds have been controlled, vigilant digging or hand-pulling young weeds as they emerge can effectively keep lawns free of broadleaf weeds for long periods. Some weeds are difficult to remove manually, but can be eliminated by spot-treating them with herbicides sold in ready to use (RTU or pre-mixed), hand-held spray bottles.

Chemical Control of Broadleaf Weeds

In lawns where broadleaf weeds have become a problem, an application of an approved herbicide may be necessary for their removal so that the turf can be improved through better management and cultural practices. Lawn weeds are most effectively controlled when young or immature and during warm (70-85F) and moist periods of late spring (May to early-June) and autumn (September to early-October). Several materials are available for broadleaf weed control, but different weeds are susceptible to different products. Thus, proper identification of the weeds is essential before the most economical and effective herbicide can be chosen.

Frequently, two or more different herbicides are sold as pre-packaged mixtures. Most of the materials discussed are sold by several manufacturers, often under different trade names with different formulations and concentrations. Therefore, no rates are given. Read and follow the label directions on the herbicide container carefully. Applying rates too low may result in inadequate control while applying rates too high can reduce control and injure the turf. Ready to use (RTU) formulations are widely available and are easy and safe for homeowners to use for spot treatment of small numbers of weeds. These RTU's also are available for hose-end sprayer attachment for treating larger areas. Granular herbicide formulations are common in the market for application by spreaders. The following herbicides are available for the selective removal of broadleaf weeds from lawns:

2,4-D is the oldest, most widely used turfgrass herbicide, and it provides fairly broadspectrum control. Generally, 2,4-D is used in combinations with other herbicides to increase the spectrum of weeds that can be controlled. This chemical is particularly effective for control of tap rooted weeds such as dandelion, broadleaf plantain, shepherd's purse and mustards. Some notable weeds not controlled well by 2,4-D are white clover, chickweeds, ground ivy and purslane. Low volatile ester formulations are available, but only amines should be used in a landscape setting.

MCPA is chemically-related to 2,4-D and may be used as a 2,4-D substitute in pre-packaged mixtures. MCPA is not as broadspectrum as 2,4-D, and its use alone (i.e., not mixed with another herbicide) is not usually recommended.

MCPP is most effective in controlling several perennial or winter annual turf weeds that often are viney in nature. Important weeds controlled include common chickweed, clovers, and young lespediza.

Dicamba controls many different weeds, several of which are not easily controlled with 2,4-D or MCPP. Of particular importance are some annual weeds that have a prostrate growth habit, which include knotweed, purslane, carpetweed and spurge. Dicamba, as well as most other herbicides, is less effective when applied to mature weeds.

Dichlorprop (2,4-DP) is sold in pre-packaged mixtures with 2,4-D and other of the aforementioned herbicides, and it provides broadspectrum weed control.

Triclopyr and Clopyralid are non-phenoxy herbicides. Pre-packaged mixture of both herbicides only is sold under the trade name of Confront®. This mix provides broadspectrum control of many common broadleaf weeds including creeping oxalis. It also does not have a strong persistent odor like other broadleaf herbicides. Clopyralid alone is sold under the trade name of Lontrel®. Lontrel® has a narrow spectrum of susceptible weeds and is primarily used to control white clover in bentgrass turf grown on golf courses. Triclopyr also can be found in mixtures with other herbicides. Triclopyr + 2,4-D is considered one of the more effective products for controlling violets and corn speedwell. **Clopyralid is not longer available for use on home lawns**. This is because clopyralid can persist on clippings for very long periods. Clippings treated with clopyralid and used as mulch can damage or kill vegetable plants and some ornamentals, even after having been composted for a year.

Fluoxypyr is a non-phenoxy herbicide that was developed to replace clopyralid for use on home lawns. If is sold under the trade name of Spotlight®, but performs best when used in combination with other herbicides like 2,4-D, MCPP or dicamba.

Bromoxynil will safely control broadleaf weed seedlings in newly established turf and is sold under the trade name of Buctril®. This herbicide, however, does not control mature, broadleaf weeds and may only be used on sod farms. It is now difficult to find bromoxynil in the marketplace, and it may soon be withdrawn for use on all turfgrasses.

Isoxaben is sold under the trade name of Gallery® and ProScape® and it is used primarily in the early autumn for preemergence control of numerous winter annuals (especially henbit and common chickweed) and some perennial broadleaf weeds. It has no postemergence activity against emerged broadleaf weeds. Isoxaben is expensive and is primarily used in ornamental beds rather than turf.

Quinclorac is sold under the trade name of Drive®. It effectively controls only a few broadleaf weed species including white clover, corn speedwell and violet. To be effective it must be tank-mixed with methylated seed oil or crop oil. The primary use of this postemergence herbicide is for crabgrass control.

Combinations of the above mentioned herbicides are very common. Combination products allow for the control of a broader range of weed problems than single herbicides. In addition, some combinations may allow for the control of certain weed species that cannot be controlled easily by the individual components alone. Some commonly used combinations are: 2,4-D + MCPP; 2,4-D + dicamba; 2,4-D (or MCPA) + MCPP + dicamba; 2,4-D + dichlorprop; 2,4-D + triclopyr; 2,4-D + clopyralid + triclopyr; fluoxypyr + 2,4-D + dicamba and many others. It is highly recommended for homeowners to purchase pre-packaged mixtures of two or three herbicides. By using mixtures, homeowners have less hassle and will achieve better overall weed control.

Mixtures of herbicides will effectively control most broadleaf weeds found in lawns. Listed in the table below are several weed species and their susceptibility to the most common turf herbicides. The best times of year to control most broadleaf weeds are autumn (especially late September and October) and spring (especially May).

To use these herbicides effectively for broadleaf weed control in lawns several points should be remembered:

1. Read and follow the label directions carefully.

2. Spray when the temperature is over 70°F and the weeds are actively growing. Do not spray when the temperature is over 85°F as turfgrass damage may result, and because a few of these products (i.e., low volatile esters) are prone to volatilization. Most broadleaf herbicides are available as amine formulations, which do not volatilize. The odor emitted by amines is from the solvent used to dissolve the active ingredient.

3. Treat only when soil is moist and plants are growing vigorously. Do not apply herbicides during droughty periods when soil is dry.

4. Do not mow one day prior to and after applying a herbicide.

5. Spray formulations (i.e. liquids) are generally more effective than granular forms of broadleaf herbicides, but granular products are easier to handle and apply for homeowners.

6. Granular formulations should be applied when the foliage is moist, such as during early morning hours when there is a heavy dew present. Newer formulations of some granular products are just as effective as sprayable materials for controlling weeds such as dandelion, broadleaf plantain and white clover.

Precautions for Using Broadleaf Herbicides

1. Ornamental plants, trees, shrubs, and vegetables can be susceptible to these chemicals. **Do not** spray around homes and gardens when there is wind. Even a slight breeze is likely to carry spray droplets to susceptible ornamental and garden plants. Low volatile ester formulations vaporize at relatively low temperatures and may injure nearby ornamentals, vegetables, etc. Low volatile esters, however, are not commonly sold in the homeowner market, but may be used by professional applicators.

2. Dicamba is included in many herbicide combination products and also in some granular weed and feed (fertilizer-herbicide) combinations. This and other broadleaf herbicides move readily in some soil types and can be absorbed by plant roots. For unknown reasons, some ornamentals (e.g., privet, cut-leaf maple, and others) are prone to root uptake injury by dicamba, but not the other common broadleaf herbicides that have similar soil mobility properties. Therefore, products containing dicamba should not be used near the drip-line of trees or near sensitive ornamentals where it can be absorbed by roots.

3. Do not use any of these herbicides on a newly seeded lawn. Wait until the new lawn has been mowed at least three times before treating (usually about 6-8 weeks after seedling emergence).

4. The herbicides listed in this publication are safe to use on established tall fescue, Kentucky bluegrass, fine-leaf fescues (i.e., creeping red, hard, Chewings, hard sheep), bermudagrass and zoysiagrass lawns. All herbicides have the potential to cause some foliar yellowing. Do not use 2,4-D or triclopyr on lawns where bentgrasses or roughstalk bluegrass are considerable desirable species.

5. Do not use grass clipping treated with herbicides as a garden mulch. Except for Confront® and Lontrel® (i.e., herbicides containing clopyralid), herbicide-treated clippings can be composted for a year or more and then be used safely as a mulch. Clopyralid-treated clippings should **not** be composted or used as a mulch as this herbicide has a long residual.

6. Thoroughly clean the sprayer to include hose and boom after using these herbicides. It is advised that one sprayer be used for lawns and another for spraying ornamentals. Do not allow spray mixtures or sprayer wash solutions to spill or leak onto areas where they can be taken up by foliage or roots of trees or ornamentals.

7. Keep herbicide containers closed, properly labeled, and safely stored.

8. Always keep a pesticide in its original container.

CAUTION: Most herbicides are relatively safe to humans and pets when handled and applied carefully. Greatest care must be taken during the mixing of concentrates. Applicators should wear rubber gloves and boots, long sleeve shirts, long pants and eye protection. Avoid prolonged or repeated contact with skin, and be sure to wash thoroughly after using them. Store away from children, animals, fresh produce and other food products. It is best not to allow people or pets onto treated sites until the herbicide has dried on the leaves. Reference to trade names does not constitute an endorsement, guarantee, or warranty. No discrimination is intended against products not mentioned.

CHEMICAL CONTROL OF COMMON BROADLEAF WEEDS FOUND IN HOME LAWNS

	Response to Herbicide(s)							
WEED	2,4-D	MCPP	Dicamba	2,4-D + MCPP	2,4-D + dichlorprop	2,4-D + triclopyr	2,4-D + MCPP + dicamba	Clopyralid + triclopyr
BLACK MEDIC	I-R	I	S	I	S	S	S	S
CARPETWEED	I-S	I	I-S	S	S	S	S	S
CHICKWEED, COMMON**	R	S-I	S	S	S	S	S	S
CHICKWEED, MOUSEEAR**	I-R	S-I	S	S	S	S	S	S
CINQUEFOIL	I-S	I-S	I-S	S	S	S	S	S
CLOVER, WHITE AND HOP	I	S	S	S	S-I	S	S	S
DANDELION	S	S	S	S	S	S	S	S
DOCK, BROADLEAF & CURLY	I	I-R	S	I	I	I	S	S
GARLIC, WILD***	S-I	R	S-I	I	I	I	S-I	S-I
GROUND IVY***	I-R	I	S-I	I	I	S	S-I	S-I
HAWKWEED	S-I	R	S-I	S-I	S-I	S	S-I	S
HENBIT**	I	I	S-I	I	S-I	S-I	S-I	S-I
KNAWEL (German Moss)	R	I	S	I	S	S-I	S	S
KNOTWEED*, **	R	I	S	S-I	I	I	S-I	S-I
LAMBSQUARTERS, COMMON	S	S	S	S	S	S	S	S
LESPEDIZA	I-R	S	S	S	S	S	S	S
MUSTARDS	S	I	S	S	S	S	S	S
ONION, WILD***	I	R	I	I	I	I	S-I	S-I
OXALIS, COMMON	R	R	I-R	S	S	S	S	S
OXALIS, CREEPING	R	R	R	I-R	S-I	S-I	I-R	S
PLANTAINS	S	I	I-R	S	S	S	S	S
PURSLANE	I	R	S	I	I	I	S-I	S-I
RED SORREL***	I-R	I	I	I-R	I-R	I-R	I-R	I-S
SHEPHERDSPURSE	S	S-I	S	S	S	S	S	S
SPEEDWELL, CORN**	R	R	R	R	I-R	I-R	I-R	I-R
SPURGE, SPOTTED OR PROSTRATE***	I-R	I	S-I	S-I	S	S	S	S
THISTLES	S-I	I	S	S-I	S-I	S-I	S-I	S
VIOLET, WILD***	R	R	R	R	R	S-I	R	S-I
WILD CARROT	S	I	S	S	S	S	S	S
WILD STRAWBERRY	R	R	S-I	R	I	I	S-I	S-I
YARROW, COMMON	I	I-R	S	I	I	I	S-I	S-I
YELLOW ROCKET	S-I	I	S-I	S-I	S	S	S	S

RESPONSE: R = Resistant (i.e. not susceptible to the herbicide), S = Susceptible, I = Intermediate (retreatment may be necessary).

* Very young plants (2-3 leaf stage) can be controlled in early spring with 2,4-D.

** Some weed species can be controlled by a fall applied, preemergence herbicide such as isoxaben (Gallery or ProScape).

*** Weeds are most susceptible when immature; mature weeds often require two or more treatments on a 21 to 28 day interval in the spring and/or autumn.