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TURFGRASS SCIENCE

at the University of Tennessee

Controlling Winter Annual Broadleaf Weeds

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Introduction

Maintaining a vigorous turfgrass stand will protect against weed infestation. However, during the winter months turfgrasses are not actively growing and are therefore susceptible to the encroachment of winter annual broadleaf weeds. Controlling winter annual broadleaf weeds before they are able to set seed will not only reduce the likelihood of an outbreak the following year, but improve the aesthetic quality of the turfgrass stand.

Life Cycle of Winter Annual Broadleaf Weeds

Winter annual broadleaf weeds complete their life cycle within a 12-month period. Seeds germinate in the late summer and early fall; plants grow during the winter and flower the following spring. Control measures implemented in the fall are often more effective than those applied in the spring once flowering has initiated. Young, actively growing plants are more readily controlled than fully mature, flowering plants.

Many winter annual broadleaf weeds are prolific seed producers. If not controlled,

plants will produce seed in the spring that will remain in the soil until environmental conditions are appropriate for germination. Controlling winter annual broadleaf weeds before seed set will reduce future weed problems.

Winter Annual Broadleaf Weed Identification

Proper weed identification is an essential step in weed control. Some winter annual broadleaf weeds commonly found in Tennessee turfgrasses are outlined below. For more information on weed identification, visit <http://tennesseeturfgrassweeds.org>

Common Chickweed (*Stellaria media*)

Common chickweed has a shallow root system and is often found in wet, shady turfed areas. Leaves are opposite, shiny and egg-shaped to elliptic. The uppermost leaves are without a petiole. Common chickweed is easily identified by the lines of vertical hairs present along the stem. Common chickweed is similar to mouse-ear chickweed (*Cerastium vulgatum*) in appearance; however, mouse-ear chickweed is a perennial that roots at the nodes, and has oblong leaves that are prominently hairy.



Figure 1: Common Chickweed (*Stellaria media*)



Figure 2: Corn Speedwell (*Veronica arvensis*)



Figure 3: Henbit (*Lamium amplexicaule*)

Corn Speedwell (*Veronica arvensis*)

Corn speedwell (Figure 2) is a low-growing weed that thrives in weakened turfgrass stands. Corn speedwell is a common weed problem in newly established areas of cool-season turfgrass. Like other speedwells (*Veronica spp.*), the upper and lower leaves of corn speedwell differ in appearance and arrangement. Lower leaves are rounded, toothed and arranged opposite. Upper leaves are smaller, pointed and arranged alternate. The entire plant is covered in soft, white hairs. Corn speedwell produces small, bright blue flowers

Henbit (*Lamium amplexicaule*)

Henbit (Figure 3) has a square stem that can be purplish. Henbit branches freely from the base stem, the leaves are kidney-shaped, serrated and densely hairy. Uppermost leaves lack petioles. Flowers are purple and arranged in whorls. Henbit is similar in appearance to purple deadnettle (*Lamium purpureum*); however, the uppermost leaves of purple deadnettle have a red-to-purple tinge and are affixed to a petiole.

Purple Deadnettle (*Lamium purpureum*)

Purple deadnettle (Figure 4) is similar in appearance to henbit (*Lamium amplexicaule*), except that its leaves are attached to petioles, where the leaves of henbit are not. Leaves of purple deadnettle also often have a purplish tinge. Purple deadnettle flowers in early spring.

Shepherd's Purse (*Capsella bursa-pastoris*)

Shepherd's-purse develops from a basal rosette of lanceolate, rounded leaves arranged alternately on the stem. As the plant matures, leaves become deeply lobed. Shepherd's purse is sometimes confused with common dandelion (*Taraxacum officinale*), which has lobes that point towards



Figure 4: Purple Deadnettle (*Lamium purpureum*)

the base of the plant. Lobes on Shepherd's purse point outward. The plant is identified by the heart-shaped/triangular fruit it produces in the spring. Shepherd's purse is common in newly seeded turfgrass areas that lack density.

Cultural Control Options

Implementing proper fertilization, mowing and irrigation practices during the summer months will lead to the development of a healthy, dense turfgrass stand in the fall. Increasing turfgrass density will reduce the number of voids in the canopy for winter annual broadleaf weeds to invade.

Overseeding warm-season turfgrass species like bermudagrass (*Cynodon spp.*) with cool-season species like perennial ryegrass (*Lolium perenne*) can help prevent winter annual broadleaf weed problems. Overseeded perennial ryegrass will grow longer into the fall than bermudagrass and subsequently will be more competitive against winter annual broadleaf weed invasion.

Chemical Control Options

Preemergence

Isoxaben (Gallery™ 75DF) herbicide must be applied prior to the germination of weed seed, so target applications for late summer. Gallery™ can be applied at rates of 0.66-1.33 lbs product per acre and must be watered in after application. If renovating during the fall, do not apply isoxaben until seedlings have reached the three-leaf stage and are tillering. Do not use this product on warm-season turfgrasses that are to be overseeded.

Postemergence

Numerous herbicides are available for postemergence control of winter annual broadleaf weeds. While some products are discussed below, a complete list can be found in Table 1.

When applied early in the life cycle of young plants, these herbicides can be highly effective.

Phenoxy Herbicides

Phenoxy herbicides include 2,4-D, MCPP and MCPA. While dicamba behaves much like a phenoxy, it is actually a benzoic acid. These are the most commonly used herbicides for controlling broadleaf weeds in turf. While effective individually, broad-spectrum weed control is often achieved by applying products containing more than one of these materials. There are multiple options available, including Trimec Classic™ (2,4-D, MCPP, dicamba) and Three-Way™ (2,4-D, MCPP, dicamba). Most phenoxy herbicides are safe for use on Kentucky bluegrass (*Poa pratensis*), tall fescue (*Festuca arundinacea*), bermudagrass (*Cynodon* spp.) and zoysiagrass (*Zoysia* spp.). Always check the product label for specific turfgrass tolerance information.

These materials can injure surrounding desirable vegetation. Do not apply phenoxy herbicides underneath or around desired vegetation or in conditions that favor herbicide drift or volatility (high winds or temperatures greater than 85 degrees F).

While granular fertilizers containing phenoxy herbicides are available, efficacy is significantly greater when these herbicides are applied as liquids.

Pyridinecarboxylic acids (or picolinic acids)

Triclopyr + clopyralid (Confront™) is another option for controlling winter annual broadleaf weeds in Kentucky bluegrass, tall fescue, bermudagrass and zoysiagrass; however, this product cannot be used by homeowners, nor can it be applied to warm-season turfgrass mowed at less than ½ inch.

Protox Herbicides

Carfentrazone (Quicksilver™ 1.9 EC) is a product designed to be used by professional applicators that is safe on most warm- and cool-season turfgrasses, except hybrid bermudagrass (*C. dactylon* X *C. transvaalensis*). Commercial products like SpeedZone (carfentrazone, 2,4-D, MCPP, dicamba) and PowerZone (carfentrazone, MCPA, MCPP, dicamba) can be used to widen the spectrum of weed control. These combination products are ideal for winter annual broadleaf control because the addition of carfentrazone to mixes of phenoxy herbicides improves efficacy in cold weather.

SpeedZone and PowerZone are also safe for use on more turfgrass species than Quicksilver.

Sulfentrazone (Dismiss™) is a product safe for use on nearly all warm- and cool-season turfgrasses grown in Tennessee. It provides control of not only broadleaf weeds, but some grassy weeds and sedges as well. This product should not be applied near landscape beds nor should it be mixed or applied near bodies of water. The label requires that a minimum distance of 50 feet be maintained to the nearest source of well water. Sulfentrazone (Dismiss) can be readily tank-mixed with other herbicides to increase the spectrum of weed control.

ALS herbicides

Multiple ALS herbicides can be used to control some specific winter annual broadleaf weeds. These herbicides include chlorosulfuron (Corsair™ 75WDG), metsulfuron (Blade™), rimsulfuron (TranXit GTA™) and trifloxysulfuron (Monument™ 75WG). Refer to each product's label for specific information on the species of weeds controlled. Most of these products are only available to professional pesticide applicators and most are not safe for use on cool-season turfgrass. These materials can also be readily tracked to non-target sites.

Non-Selective Herbicides

Non-selective herbicides such as glyphosate (Roundup Pro™) and diquat (Reward™ 2L) can be applied to dormant bermudagrass turf for control of winter annual broadleaf weeds. These applications cannot be made to bermudagrass that are overseeded, as glyphosate and diquat will remove any overseeded perennial ryegrass or roughstalk bluegrass (*Poa trivialis*) present.

Conclusion

The use of proper maintenance practices throughout the summer will help prevent the encroachment of winter annual broadleaf weeds in the fall. Control measures should be used before these weeds produce seeds that can be deposited into the soil seed-bank. There are multiple options for postemergence control of winter annual broadleaf weeds. Homeowners should rely on commercially available products containing multiple phenoxy herbicides. Professional applicators can select from an array of different products, depending on the species of turfgrass the weeds have infested.

Postemergence Herbicides (Active Ingredient)	Trade Name	Rate (Product/Acre)	Comments
Phenoxy Herbicides			
2,4-D	2,4-D Amine 4L	1.5-2.0 pt	Apply to well-established turf; don't apply to newly overseeded warm-season turfgrass
MCPP	MCPP 2EC	4-7 pt	Apply to well-established turf; don't apply to newly overseeded warm-season turfgrass
Benzoic Herbicides			
dicamba	Banvel 4S; Vanquish 4S	0.5-1.0 pt	Apply to well-established turf; don't apply to newly overseeded warm-season turfgrass
Combination Herbicides			
2,4-D + MCPP + dicamba	Trimec Classic; Three-Way	Various products available; refer to label	Provides broad spectrum weed control; use rates differ between warm- and cool-season turf; can cause injury to warm-season turfgrass transitioning in and out of dormancy.
2,4-D, triclopyr + clopyralid	Momentum	3-4 pt	Not for use by homeowners. Apply to well-established turf; don't apply to warm-season turf maintained at less than 1/2 in mowing height; use rate is weed specific (refer to label).
carfentrazone, 2,4-D, MCPP, dicamba	SpeedZone	2-5 pt	Carfentrazone addition improves efficacy in cold weather compared to other phenoxy combinations.
carfentrazone, MCPA, MCPP, dicamba	PowerZone	2-6 pt	Carfentrazone addition improves efficacy in cold weather compared to other phenoxy combinations.
triclopyr + clopyralid	Confront	1-2 pt	Not for use by homeowners. Apply to well-established turf; don't apply to warm-season turf maintained at less than 1/2 in mowing height; use rate is weed specific (refer to label).
bentazon + atrazine	Prompt 5L	1.8-2.4 pt	Restricted-use pesticide only safe for use on bermudagrass, zoysiagrass, and centipedegrass; use rates are dependent on weed size.
Protox Herbicides			
carfentrazone	Quicksilver	1.0-2.1oz	For use by professional applicators. Do not mix or apply this product near bodies of water; can be combined with other herbicides to widen the spectrum of control; don't apply to warm-season turfgrass transitioning in and out of dormancy.
sulfentrazone	Dismiss	4-12 oz	Use rate varies between warm- and cool-season turf; do not mix or apply this product near bodies of water; do not apply to warm-season turfgrass transitioning in and out of dormancy.
ALS Herbicides			
chlorosulfuron	Corsair 75WDG	1-5.3 oz	Use restricted to professional applicators. Can be used on Kentucky bluegrass; DO NOT USE ON TALL FESCUE; don't apply to overseeded bermudagrass; apply prior to the initiation of green up; non-ionic surfactants improve efficacy.
metsulfuron	Blade; Manor	0.125-1.0 oz	Use restricted to professional applicators. Safe on Kentucky bluegrass at lower rates; don't apply to overseeded bermudagrass; non-ionic surfactants improve efficacy.
rimsulfuron	TranXit	0.5-2.0 oz	Use restricted to professional applicators. Don't use on cool-season turfgrasses, don't apply to over-seeded bermudagrass; don't apply in areas where children contact turf; non-ionic surfactants improve efficacy.
trifloxysulfuron	Monument	0.33-0.56 oz	Use restricted to professional applicators. Don't use on cool-season turfgrasses; don't apply to overseeded bermudagrass; non-ionic surfactants improve efficacy.
Non-Selective Herbicides			
diquat	Reward 2L	1-2 pt.	DORMANT BERMUDAGRASS ONLY; apply prior to initiation of green up.
glyphosate	Roundup Pro	0.5 qt	DORMANT BERMUDAGRASS ONLY; apply prior to initiation of green up.

Disclaimer

This publication contains herbicide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the herbicide applicator's responsibility, by law, to read and follow all current label directions for the specific herbicide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

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