Winter Weed Control in Southern Turf — Early Detection, Recognition and Action are Key

by Lambert B. McCarty

Weeds in winter are a distraction due to their color and leaf textural differences from the brown-colored, dormant turf. In addition, weeds shade the dormant turf, thus delaying "green-up" in spring.

In order to be effective, weed control should be a carefully planned and coordinated program. Understanding how and why weeds are present is important in developing a weed control strategy. Knowing what chemical options are available and using proper timing and application techniques round out a successful control program.

Provide healthy turf

Providing the agronomic practices that promote a healthy, dense turf is the first, best defense against weeds. Most annual weeds require a certain amount of direct sunlight for optimum germination. Dense turf reduces sunlight penetration, thus inhibiting weed establishment. Thick turf also insulates the soil, which helps maintain soil temperatures outside the optimum germination range of many weed seeds. Table 1, on the other hand, lists commonly found growing conditions favoring weed invasion.

Sound agronomic practices promoting healthy turf include using the proper mowing height and frequency, providing adequate fertilizer rates and appropriate ratios, and watering. The last major nitrogen fertilization for most warm-season turfgrasses should be applied no later than September, and should contain at least a 1:2 nitrogen to potassium ratio to promote rooting before winter. The mowing height at this time of year should also be raised to the maximum recommended level for your particular turfgrass, as this serves to promote healthy turf rooting and also continues to shade the soil surface, as mentioned earlier. Water should be applied at rates to provide good (but not excessive) soil moisture. Weeds such as annual bluegrass, goosegrass, and nutsedge love wet soils. Watering should be stopped once the turfgrass has gone dormant for the winter season.

Traffic on warm-season turfgrasses also should be minimized in fall, as the turf does not have time to recuperate before cooler temperatures arrive. Damaged turf provides an opening for weeds to invade.

Identification and biology

Positive identification of weeds appearing in turf is the first step in understanding why they occur and how to control them. In the past, turf managers found this frustrating because of the lack of an adequate turf weed identification guide. *Weeds of Southern Turfgrasses*, a highly recommended identification guide, is now available. It was published

Table 1. Growing conditions which favor certain weed infestation and growth.

Growing Condition	Weeds Favored
Low Soil pH	Red Sorrel
High Soil pH	Plantains
Droughty Soils	Spurge, Black Medic, Woodsorrel Lespedeza, Knotweed
Wet Soils (Overwatering)	Annual Bluegrass, Sedges, Goosegrass, Alligatorweed, Moss, Algae
Sandy ('Poor') Soils	Quackgrass, Poorjoe, Sandspur, Yellow Sneezeweed
Low Mowing Height	Annual Bluegrass, Chickweed, Algae
Compacted Soils	Goosegrass, Annual Bluegrass, Knotweed
Low Soil Nitrogen Levels	Legumes (Clover, Black Medic), Chickweed, Speedwell, Chicory, Broomesedge, Yellow Sneezeweed

for turfgrass managers and can be obtained through the Florida, Georgia, or Alabama Cooperative Extension Services. This guide provides over 400 color photographs of almost 200 weeds common to Southern turf. Additional means of identifying weeds include consultations with county extension agents, lawn-care operators, and industry representatives

Winter weeds germinate in late summer through early fall, when daytime temperatures are in the 70° F range. They grow throughout the winter months, and flower or produce seedheads during late winter and early spring. In this, winter weeds are sneaky: they blend with the turf in the fall and early winter months, not becoming noticeable until late winter when growth spurts, along with seedheads and flowers, make them stand out in the turf.

Scouting

Information on weed identities, where they occur, and the level of infestation are needed for informed management decisions on whether control is required, and if so which option(s) to consider. Scouting simply means dividing the service area into logical sections or units, then determining which weed(s) are present at what level in each division. Residential plantings are normally divided into front, back and side yards. For appearance' sake, front lawns generally receive priority control implementation, followed by the sides and then the back. Golf courses are sectioned, by hole, into tees, fairways, greens, and roughs. Roughs receive the least attention for weed control; greens and tees receive the most. The weeds present in each unit, and a general notation on cover patterns, are recorded. Weed pattern notations can be as elaborate as estimating the percent cover for each monitoring division, or more realistically, involve only simple verbal ratings like "widespread," "spotty," or "single patch."

Early fall (September/October) is the optimum scouting timing for winter weed control, with a follow-up in early spring (March/April). The fall scouting allows early detection and pressure level (weed frequency) assessments for each monitoring area. The early spring scouting identifies the weeds that have not been controlled, and where they can be expected to occur the following winter season.

The threshold levels that must be reached before treatment becomes necessary are generally determined by the owner or manager of the turf site. This level of tolerance tends to be rather low for high traffic or visibility areas such as golf tees and greens, and home front lawns.

Herbicide selection and use

Based on weed germination timing, herbicides are generally classified as preemergence or postemergence materials. Preemergence herbicides are applied prior to weed seed germination, and inhibit development of the germinating seed. If applied after germination, preemergence herbicide effectiveness diminishes greatly. Preemergence herbicides also should be activated by 1/4 in. to 1/2 in. inch rainfall or irrigation after application.

Postemergence herbicides generally are effective only on visible weeds. Young (two to four leaf stage) and actively growing annual weeds are the most susceptible, and require the least amount of herbicide. At this stage, herbicide uptake and translocation are favored and weeds have less developed, more tender root systems. Delaying application results in poorer translocation of herbicides in plants, more difficulty controlling mature plants, and possible setback of turf during green-up.

Postemergence herbicides should only be used when weeds are actively growing. This occurs primarily when temperatures are between 40° and 80°F. Material applied outside this temperature range tends to work too slowly to be effective or to result in excessive turf damage.

Broadleaf weed control

Preemergence broadleaf weed control is provided by the herbicide isoxaban (Gallery®). Gallery® must be applied before broadleaf weeds germinate, and it should also be tank-mixed with another preemergence herbicide such as prodiamine (Barricade®), Dithiopyr (Dimension®), pendimethalin (Prowl®), or oryzalin (Surflan®) if annual bluegrass is expected.

Atrazine (AAtrex®) and simazine (Princep®) are the backbone products for postemergence winter weed control for warm-season turfgrasses such as centipedegrass, St. Augustinegrass, zoysiagrass, and bermudagrass. These materials should be used in mid fall (October/November) for optimum control. A follow-up application may be needed

3 weeks later for total control. These herbicides become less effective when applied after January and also tend to increase the potential for turfgrass damage if applied later.

For those broadleaf weeds that these herbicides do not effectively control, a single or combination applications of 2,4-D, 2,4-DP, MCPP, MCPA or dicamba are needed (see Table 2). These herbicides are selective, systemic, foliar-applied herbicides. Several considerations should be noted before using one or more of these materials. First, few broadleaf weeds, especially perennials, are controlled with just one of these herbicides. A combination of two or more is generally necessary for satisfactory results. Control also depends on the maturity of the weed. Younger weeds are easiest and cheapest to control. Ideally, applications should ideally be initiated in November to take advantage of these plants being in younger, more succulent stages of growth. Waiting until March or April to attempt control requires sequential applications, spaced 10 to 14 days apart. This not only puts a greater burden on the environment, but also increases labor costs, outlays for herbicides costs and wear and tear on equipment. Later applications also may delay green-up, and it may take longer for herbicides to work.

Until recently, these herbicide combinations were used as the main control chemicals for broadleaf weeds. "New chemistry" materials such as triclopyr + clopyralid (Confront®) have been introduced as alternatives to the traditional herbicides mentioned above. Although this new chemistry provides a wider array of materials to choose from, economics and turf tolerance must still be considered before they are used.

Grass weed control

In winter, the predominant annual grass weeds in southern turf are annual bluegrass and clumps of ryegrass that have escaped from sites that were overseeding. Annual bluegrass can be controlled

Table 2. Turfgrass tolerance to postemergence herbicides.

Weed	Atrazine/ Simazine	2,4-D	Mecoprop (or MCPP)	Dicamba	2,4-D + MCPP	2,4-D + 2,4-DP	2,4-D + MCPP dicamba	2,4-D + triclopyr
Betony, Florida	S-I[1]	I	I	I-S	I	I	I-S	--
Bittercress, hairy	--	S	I	S	S	S	S	--
Black Medic	--	R	I	S	I	S	S	--
Burclover	--	I-R	S	S	S-I	S	S	--
Buttercups	I	S-I	I	I-R	S	S	S	--
Carrot, wild	--	I	I	S	I	S-I	S	--
Chickweed, common	S	R	S-I	S	S	S	S	S
Chickweed, mouse-ear	I	I-R	S-I	S	S	S	S	S-I
Chicory	--	S	S	S	S	S	S	--
Clover, hop	S	I	S	S	S	S	S	S
Clover, white	S	I	S	S	S	S	S	S-I
Dandelion	I-R	S	S	S	S	S	S	I-S
Garlic, wild	--	S-I	R	S-I	S-I	S-I	S-I	--
Geranium, Carolina	--	S	S-I	S	S	S	S	--
Healall	--	S	R	S-I	S	S	S	--
Henbit	S	I-R	I	S	S-I	S	S	
Ivy, ground	--	I-R	I	S-I	I	I-S	S-I	--
Knawel	--	R	I	S	S-I	S-I	S	--
Mustard, wild	S	S	I	S	S	S-I	S	--
Onion, wild	--	I	R	S-I	I	I	S	--
Parsley-piert	S	R	S-I	S-I	S-I	R	S-I	S
Pennywort	S	S-I	S-I	S-I	S-I	S-I	S-I	--
Pepperweed	--	S	S-I	S	S-I	S	S	--
Shepherd's-purse	--	S	S-I	S	S-I	S	S	--
Speedwell, corn	S	I-R	I-R	I-R	I-R	I-R	I-R	--
Spurweed (lawn burweed)	S-I	I	S-I	S	S-I	I	S	S
Strawberry, India mock	--	R	I	S-I	I	R	S-I	--
Thistles	--	S-I	I	S	S-I	S-I	S	--
Violet, johnny-jumpup	--	I-R	I-R	S-I	I-R	I	I-R	--
Yellow rocket	--	S-I	I	S-I	S-I	S-I	S	--

[1]S = susceptible; I = intermediately susceptible, good control sometimes with high rates, however a repeat treatment 3 - 4 weeks later each at the standard or reduced rate is usually more effective; R = resistant in most cases. Not all weeds have been tested for susceptibility to each herbicide listed.

effectively with postemergence herbicides, assuming the turf is not overseeded with ryegrass or other cool-season grasses. In non-overseeded turf, atrazine (AAtrex®), simazine (Princep®), and Kerb® provide excellent control of annual bluegrass and ryegrass. The key to the use of these materials is timing. The first applications should be made in mid fall, when weeds are smaller and easier to control. A follow-on application is necessary in January to control the second flush of seed germination that normally occurs at this time, especially with annual bluegrass. Atrazine and simazine have the added benefit of also controlling many winter annual broadleaf weeds such as lawn burweed, chickweed, and henbit (Table 2). However, as mentioned earlier, if control is attempted later, in March or April, problems with herbicide efficacy and turf damage may occur.

Sedge control

Purple and yellow nutsedges are the most prominent in turf. Although both are perennials, they tend to die-back with the onset of frost, and become relatively unnoticeable in winter lawns. If herbicidal control is not initiated by late summer, these nutsedges should be allowed to remain in the lawn for treatment the following spring. Yellow nutsedge can be suppressed in spring with the preemergence herbicide Pennant®. Postemergence control of yellow nutsedge is with Basagran T&O® or Manage®. Purple nutsedge is suppressed with the postemergence herbicides Manage® or Image®. Image®, however, should be used only when the turfgrass is actively growing (mid-summer for warm-season grasses). If hard-to-control weeds persist, Prompt®, which is a pre-packaged combination of atrazine and bentazon, can be used. Repeat applications, spaced four to six weeks apart are recommended.

Overseeded turf

Weed control in overseeded turf is more difficult because the winter weeds' susceptibility to herbicides is similar to that of the overseeded ryegrass (see Table 3). Until fully established, ryegrass is somewhat sensitive to many postemergence herbicides.(Preemergence herbicide control choices are limited, and each has its strengths and its weaknesses. Bensulide (Betasan®, PreSan®), Balan®, and Kerb® provide good preemergence annual bluegrass control, but must be used 60 days before overseeding. This means the application must occur in mid-summer in most areas. Applications made closer to overseeding may result in an unacceptable ryegrass stand.

Rubigan®, a fungicide with selective herbicide activity, also is available for preemergence annual bluegrass control and does not affect overseeded ryegrasses or bermudagrass adversely. A series of two or three applications provides the best results in control of bluegrass. The last application should be made two weeks prior to overseeding. Successive applications provide the best control, but require appropriate timing, multiple passes and careful planning.

Postemergence control of annual bluegrass in overseeded situations is limited . Prograss® is the only material for this purpose available to be used in overseeded bermudagrass turf. However, to prevent undesirable turfgrass injury, careful attention to herbicide application rate, application timing and application frequency are necessary. Prograss® should be used 30 to 45 days after overseeding, when the bermudagrass is completely dormant. If applied earlier, delayed green-up the following spring may occur. A follow-up application may be made, but not after January or, again, delayed spring green-up may result. For this reason, Prograss® is not recommended in subtropical areas like Florida where bermudagrass does not normally go completely dormant. Selective postemergence annual bluegrass control in other overseeded warm-season turfgrasses is not currently available.

Postemergence control of broadleaf weeds in overseeded turf is also provided by 2,4-D alone or combined with 2,4-DP, MCPP, or dicamba. Normally, to prevent damage, lower rates are used, and these materials are not applied until the ryegrass has become fully established. Generally, the ryegrass has been mowed at least three times before this is achieved. Only the lowest recommended rate of the chemical should be used on overseeded ryegrass, and the application usually must be repeated in 10 to 14 days. These herbicides also should be used when temperatures are above 40°F.

Henbit

White clover

All photography supplied courtesy of authors.

Table 3. Suceptibility of broadleaf weeds to turf herbicides.

Southern Turfgrass Tolerance to Postmergence Herbicides							
Herbicide	**Bahia-grass**	**Bermuda-grass**	**Carpet-grass**	**Centipede-grass**	**St. Augustine-grass**	**Zoysia-grass**	**Overseed Ryegrass**
atrazine (AAtrex + others)	D[1]	I[2]	I	S-I	S-I	I	D
Basagran T/O	S	S	S	S	S	S	S-I
Confront	I	I-S	D	I	D	I	S-I
2,4-D	S	S	I	S-I	I	S	S-I
2,4-D+dicamba	S	S	I	S-I	I	S	S-I
2,4-D+dichlorprop (2,4-DP)	S	S	I	S-I	I	S	I-D
2,4-D+MCPP	S	S	I	S-I	I	S	I-D
2,4-D+MCPP+dicamba	S	S	I	S-I	I	S	I-D
2,4-D+MCPP+2,4-DP	S	S	I	S-I	I	S	I-D
dicamba (Banvel + others)	S	S	I	S-I	I	S	I
MCPA+MCPP+2,4-DP	S	S	I	S-I	I	I	I-D
MCPP	S	S	I	S-I	I	S	I
Kerb	D	S	D	D	D	D	D
simazine (Princep + others)	D	I[2]	I	S-I	S-I	I	D

[1]S=Safe at labeled rates; I=Intermediate safety, use at reduced rates; D=Damaging or is not registered for this turfgrass, do not use.
[2]Atrazine and simazine should be used on bermudagrass only during fall and early winter months. Do not use during spring green-up.

Summary

Controlling weeds in fall requires pre-planning, as the weed are not readily noticeable at this time, and many people are more concerned with other things. Weeds are opportunistic and will take advantage of neglected turf. Good turf, plus use of selective herbicides at the correct rate, and at the correct time and temperature, will ensure greater success in weed control.

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Winter Weed Management Schedule for Warm Season Turfgrasses

Late summer	*Apply turf winterizing fertilizer which supplies adequate potassium; mow turf at the upper recommended mowing height; water to just wet the turf soil rooting zone. Apply preemergence herbicides if scouting the previous spring warrants it; do complete weed scouting for the upcoming winter season.*
Early/mid fall	*If needed, apply postemergence herbicides for annual bluegrass control.*
Mid fall	*If needed, apply postemergence herbicides for broadleaf weed control.*
Early winter	*Reapply postemergence herbicides for broadleaf weeds and annual bluegrass, if necessary.*
Winter	*Calibrate and repair sprayers; evaluate the previous year's weed control strategies; plan for the upcoming year's strategy.*
Late winter	*Apply preemergence herbicides for crabgrass control. Apply postemergence herbicides for broadleaf weed control for new customers.*
Early spring	*Apply preemergence herbicides for goosegrass control. Repeat broadleaf weed control application, if necessary, for new customers. Follow-up scouting for remaining winter weeds for formulating the upcoming fall control strategies.*
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