

NORTHERN WEED CONTROL

combines cultural/chemical tools

Once you understand your most serious weed problems you can develop a multi-pronged program, using your experience, to control them.

by TOM FERMANIAN,
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Most weeds with similar growth habits can be managed with a single strategy.

Integrated Pest Management (IPM) combines sound cultural practices with occasional application of herbicides to manage weeds. Cultural practices include mowing, irrigation, fertilization, cultivation, mechanical control, and sanitation.

Mowing

Depending on the weed species, mowing can affect the development of its population. A limited number of species are generally found in turfs, particularly well established turfs, because mowing pressures reduce weeds' recuperative potential. Some weeds, such as annual grasses, adapt to low mowing heights and frequent mowing. They can often be managed by raising the cutting when possible. Timely mowing can reduce the production of weed seeds. This can also be accomplished using plant growth regulators or collecting clippings when seedheads are present.

Irrigation

High soil moisture favors nutsedges, annual bluegrass,

crabgrass, goosegrass and many other weeds. Drying out the turf or irrigating less frequently will give the turf a competitive edge over these water-loving weeds. Carpetweed and sand-burr compete well in dry open soils. If these weeds are a problem, increase irrigation.

Fertilization

Accurate, timely fertilizations make turf a good competitor. Excess fertilization can promote weed growth. High levels of nitrogen cause annual bluegrass, crabgrass, and many other species to grow rapidly. Excessive fertilizations, particularly with soluble sources, can potentially injure turf foliage allowing weed invasion.

Cultivation/sanitation

Core aeration, vertical mowing, spiking, or slicing—is generally beneficial for turf growth. But the practices can also move buried weed seeds to the surface allowing them to germinate. Topdressing might bring in foreign seed.

Herbicides

Herbicides, particularly postemergent herbicides, is one tool any turf manager needs. Most postemergent herbicides have been developed to target either of these two large groups.

Broadleaf weeds

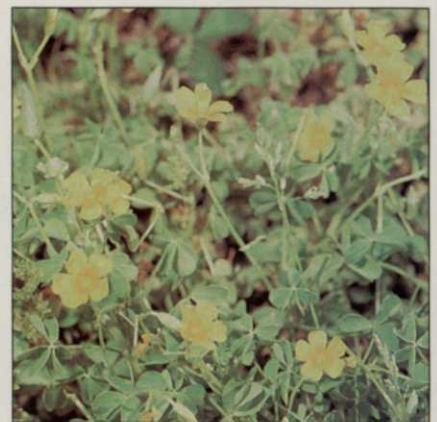
Most broadleaf weeds can be controlled with one of a large group of broad spectrum postemergent herbicides. Some narrowly focused or single species postemergent herbicides are available for difficult to control or unusual weed species. Spot control is available with a non-selective herbicide. Check the turf tolerance of any selective herbicide. Some of the postemergent herbicides have a narrow range of tolerant turf species.

2-4, D, similar compounds

One of the original selective postemergent herbicides was 2-4, D. This and other similar compounds such as mecoprop, dichlorprop, and dicamba all control a wide spectrum of broadleaf weeds. Each material has particular strengths in controlling a select group of species. Often times they are used in combination allowing



White clover can be controlled by most broadleaf herbicides



Wood sorrel with yellow flowers

for the reduction of their individual single use rates through a synergistic action. Double and triple combinations of these materials provide effective control for almost any broadleaf species in turf. They are formulated as ester- or amine-based compounds to provide greater control or more turf safety, respectively.

Non-phenoxy broad spectrum herbicides

Triclopyr and Clopyralid, are broad spectrum postemergent herbicides that can be targeted towards a wide range of weeds in many turfs. Triclopyr is often found in formulations by itself or in combinations with 2,4, D to broaden its effectiveness across a wider group of weeds. Confront is a combination of both Triclopyr and Clopyralid which is effective with many tough broadleaf weeds such as wild violets and creeping charlie.

Other postemergent broadleaf herbicides

Several materials are available for a smaller group of weeds or for special uses. Bromoxynil will not injure seedling turfgrasses and is often used as the initial material for cleaning up newly seeded turfs. Several materials such as Basagran, Vantage, and DCPA are targeted towards a small group of species. Manage and Basagran can be used for controlling yellow and purple nutsedge. **LM**

—Tom Fermanian is Associate Professor of Turfgrass Science, Dept. of Natural Resources and Environmental Sciences, University of Illinois.

TABLE 1 HERBICIDES FOR BROADLEAF WEED CONTROL IN TURF

COMMON NAME	TRADE NAMES (PRODUCERS)	USES
2,4-D	AM-40, 2,4-D Granules, 2,4-D L. V. Ester, Solution ; (Riverdale) 2,4-D Amine 4, 2,4-D LV4, SEE 2, 4-D LV4 (Riverside/Terra International) Weedone LV4 (Rhone Poulenc)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + dicamba	81 Selective Weedkiller (Riverdale) Four Power Plus (Turfgo/United Horticultural Supply) Lawn Weed Killer (Bonide) Triple D Lawn Weed Killer (Rockland)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + dichlorprop	2D + 2DP Amine, Turf D + DP (Riverdale) Fluid Broadleaf Weed Control (The Scotts Co.) Weedone DPC Ester, Weedone Amine (Rhone Poulenc)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + dichlorprop +dicamba	Strike 3 (Riverside/Terra International) Super Trimec (PBI/Gordon)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + mecoprop	2D Amine + 2 MCPP (Riverdale) 2 Plus 2 (ISK Biosciences) MCPP-2-4D (Cleary)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + MCPP + dicamba	Bentgrass Selective Weed Killer (LESCO) Brushfire, Brush-out, Brush-Whacker, HS-130, SNS-2000 (NCH) Granular Broadleaf Weed Killer (Lebanon) Mec-Amine-D (Turfgo/United Horticultural Supply) Three-Way Lawn Weed Killer (Rockland) Three-Way Selective, Three-Way DG (LESCO) Trimec Bentgrass Formula, Trimec Classic, Trimec Southern (PBI/Gordon) Triplet Selective, Triplet Water Soluble (Riverdale)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + MCPP + dichlorprop	Dissolve, Triamine, Triamine Granular, Triamine Jet-Spray, Tri-Ester (Riverdale) Jet-Spray 3-Way Weed Control (The ScottsCo.) Three-Way Ester (LESCO)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + MCPP + MSMA + dicamba	Trimec Plus (PBI/Gordon)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
2,4-D + triclopyr	Chaser (Turfgo/United Horticultural Supply) Turflon II, Turflon II Amine (LESCO)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
DCPA	Dacthal (ISK Biosciences) Garden, Turf & Ornamental Herbicide 5G, Turf & Ornamental Herbicide (Bonide) HS-110 (NCH) Super Dacthal 686 (Rockland)	Selective, post-emergence control of creeping speedwell and preemergence control of selected broadleaf species.
Dicamba	Vanquish (Sandoz) K-O-G Weed Control (The Scotts Co.)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
Isoxaben	Gallery (DowElanco)	Selective, preemergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
Triclopyr	Turflon Ester (DowElanco, Monterey)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.
Triclopyr + clopyralid	Confront (DowElanco)	Selective, post-emergence control of broadleaf weeds. See label for tolerant turfgrasses and species controlled.

IN THE SOUTH, only strongest weeds survive

Proper selection and management practices give warm-season turfgrasses the 'competitive' edge in the turfgrass manager's battle against weeds.

by FRED YELVERTON, Ph.D./University of North Carolina

Warm-season turf species are ideally adapted to the lower-tier states in the US. Cold tolerance usually determines how far north a particular warm-season turf species is used.

Proper turfgrass selection is critically important for many reasons, not the least of which is weed management. Most weed problems originate because the turfgrass is not growing vigorously and is therefore unable to successfully compete with many weed species. Good turfgrass weed management begins with proper selection of a turfgrass species.

Other common management problems that lead to weed problems include attempting to grow a particular turfgrass species where; 1) there is too much shade, 2) drainage is poor resulting in water-logged soils, 3) improper fertility and liming schedules are utilized, 4) consistent use of improper mowing heights, and

5) where soil compaction exists.

While many weed problems are brought on as a result of the above-mentioned problems, weeds can also be a present where the turfgrass is competitive and being managed properly. A good example in warm-season turf is crabgrass and goosegrass. Both of these weeds can germinate prior to breaking dormancy of the warm-season turf species. In this case, it is impossible for the turf to have a competitive edge early in the spring because it is still dormant.

Large and smooth crabgrass can germinate when soil temperatures near the

Herbicides kill weeds as they germinate and grow through the herbicide-treated zone. They do not prevent weed seed germination.

soil surface average about 52 to 55 degrees F. over several consecutive days. In many areas of the South, this can be as early as February through April.

Goosegrass germinates when soil temperatures are approximately 60 degrees F., which is usually a minimum of two to three weeks later. Depending on the area, many warm-season turf species may not reach the maximum growth potential until late April until mid-June. Where crabgrass and goosegrass problems exist, the use of appropriate preemergence or postemergence herbicides are generally required.

For maximum control with preemergence crabgrass/goosegrass herbicides, application must occur prior to any weed seed germination. They must also be watered in to set up a chemical barrier. For

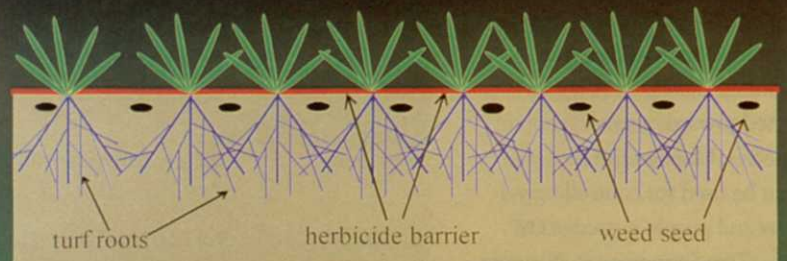
proper application and maximum control, it is helpful to understand how these herbicides work.

It is a fairly common misconception that these preemergence herbicides prevent weed seed germination. They do not prevent weed seed germination!

The germinating weed seedlings die as they grow through the herbicide treated zone. With the case of dinitroaniline herbicides such as Barricade, pendimethalin, Team, Balan, Surflan, and XL the herbicide is absorbed into young roots and shoots of emerging weeds. Cell division is inhibited and the weed seedling dies.

A common question regarding preemergence control of crabgrass and goosegrass is "Can I enhance control by splitting the herbicide application?"

Weed Control with Preemergence Herbicides



Herbicides do not prevent weeds from germinating, they kill weeds as they grow through the herbicide treated zone.

The answer to this question depends on where you are at geographically. As a general rule, the longer frost-free season, the more advantage there will be to splitting the herbicide application. For instance, in North Carolina, we often see enhanced crabgrass control by splitting the application in the eastern part of the state but seldom see an advantage in the western part of the state.

Again, this is due to the difference in the length of the season. In the far eastern part of the state, crabgrass can germinate as early as early March and the first frost is usually in November, whereas in the western part of the state, crabgrass may not germinate until early April and first frost is in October. (This excludes the mountain regions where climate prevents the use of warm-season grasses).

Compare these dates to crabgrass germination and first frost for your geographical area to get an indication on whether you should consider split applications. For goosegrass control, we almost always see an advantage to splitting the application with dinitroaniline herbicides, regardless of where we are in the state. The reason for this is goosegrass is not as easily controlled by these herbicides as is crabgrass.

By splitting the application of a dinitroaniline herbicide, generally half of the full herbicide rate is applied at the recommended time prior to any crabgrass germination. The re-

maining half is then applied about eight weeks later. One exception is with Barricade. For this product, it is generally recommended that two-thirds of the rate be applied at the initial application date and the remaining one-third be applied about eight weeks later.

When considering the use of dinitroaniline herbicides for weed control, it is generally not recommended that they be used where additional grow-in is needed. This is because these herbicides also affect root growth of the turfgrass plants. Therefore, if there are bare areas from excessive wear, or if for whatever reason the warm-season turf species is not well established (recently established, etc.), these herbicides can slow down the spread of the turf into these thin areas. The photograph on page 61 illustrates root injury from a dinitroaniline herbicide on 'Tifway' bermudagrass that is not well established. In these situations, it is generally recommended that weeds be controlled with the appropriate postemergence herbicide registered for use on the particular turfgrass species.

Control during establishment

During establishment, good weed control during establishment is often the most difficult to obtain. This is because sunlight is directly contacting the soil surface because the turf is not yet competitive. In addition, most turfgrass species are more sensitive to herbicides



and can easily be injured during the establishment phase. Good weed control is extremely important during establishment because weeds slow down establishment and poor control during this time can lead to weed seed buildup in the soil which leads to weed problems in the future.

Any new planting of turf should include a carefully planned weed management program during the establishment phase. As previously mentioned, sound turf management practices will assist in the establishment phase. Proper soil preparation, optimum soil pH, and proper soil fertility are all critical because they will allow more rapid growth of the turfgrass which shifts the competitive edge to the turf and away from weeds. If the warm-season turf species is vegetatively planted, care should be taken to keep sprigs moist after proper planting procedures.

Good weed control during establishment can result in more rapid turfgrass establishment. Note more rapid establishment of 'Tifway' bermudagrass on left side of picture as opposed to right side, where control is poor.

Good weed management in warm-season turf begins at establishment. Weed control during establishment should be planned prior to planting. Failure to plan for weeds during the establishment phase can result in failure. Remember, the best way to prevent weed problems is to properly manage the turfgrass. If herbicides are needed, make sure you check for turfgrass and weed sensitivity to the particular herbicide in question. **LM**

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