

BROADLEAF HERBICIDE USE
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Postemergence broadleaf herbicides used in turfgrass management only control existing weeds. The activity of broadleaf herbicides, for the most part, depends on the timing of application as it relates to the growth stage of the weed. Younger plants are easier to control than mature plants. Herbicide uptake and translocation is favored in younger plants. In addition to growth stage, time-of-year plays a major role in determining the effectiveness of a herbicide application. Care should be taken to avoid applications during extreme stress periods such as drought or heat. In general, broadleaf herbicides have a greater potential for injury than preemergence herbicides. Herbicide efficacy is diminished and turf safety can be compromised when applying herbicides during periods of stress.

For fifty years broadleaf weed control has been accomplished with phenoxy herbicides such as 2,4-D, 2,4-DP, MCPA, and MCPP. Dicamba, a benzoic acid, is another herbicide that falls onto the list of traditional broadleaf herbicides. These products are the standards by which any new herbicides are measured. Mixtures of these herbicides are common and numerous. The mixture most familiar to turf managers would be some combination of 2,4-D + MCPP + dicamba. This three-way mixture is inexpensive, has good turf safety, and provides control of a wide range of weeds. This combination is synergistic and provides better weed control than if the individual herbicides were applied separately. The predominance of three-way herbicides can be illustrated by viewing a list of "hard-to-control" weeds. These lists usually reflect weeds that persist after three-way herbicides have been applied (Table 1). Many formulations of these products exist from pure acids to salt-based amines and the alcohol-based esters. Amine formulations are very common and have low potential for volatility. Ester formulations are more effective than amines, however, high volatility potential limits their use due to increased risk for off-site damage. Factors that determine which formulation to use include: growth stage of the weed, climatic conditions, and sensitivity of landscape plants.

These herbicides and herbicide combinations still dominate the weed control landscape, but in recent years new herbicides have become available. Triclopyr and clopyralid are pyridine herbicides. These products are very active on a number of broadleaf weeds and are primarily used in cool-season turf. Triclopyr is used alone and in combination with other herbicides. Triclopyr has activity on many weeds that are traditionally labeled hard-to-control (2,4-D didn't work). For this reason, triclopyr is probably the first alternative to try when a three-way mixture has failed to provide acceptable control. Due to their complementary weed activity, combinations of triclopyr + 2,4-D can be very effective. Clopyralid has excellent activity on white clover and other legumes. Because of this activity, clopyralid is now included in several herbicide combinations (Table 2).

Quinclorac was recently registered and is primarily a postemergence crabgrass herbicide that also has good activity on clover and knotweed. Quinclorac has shown excellent cool-season turfgrass safety. Mature crabgrass plants (3+ tillers) can be controlled with a single application. Historically two or more applications of MSMA were needed to manage crabgrass that advanced past the 1-3 tiller stage. In addition, MSMA has the potential for turfgrass discoloration immediately after application. Fenoxypop offers improved efficacy and turf safety over MSMA. However, fenoxypop is antagonized by 2,4-D and can result in significant turfgrass injury. This prevents using them in a tank-mix to control broadleaf and annual grassy weeds in one application. Conversely, quinclorac may be tank-mixed with 2,4-D or products containing 2,4-D. There also appears to be a synergism between 2,4-D and quinclorac. Results from studies conducted in 1998 and 1999 indicate that broadleaf weed control of several broadleaf herbicides can be dramatically increased (ground ivy, speedwell, and clover) when tankmixed with quinclorac. Products containing 2,4-D have shown the most benefit from this combination. These combinations deserve consideration to be used for callbacks and mid- to late-summer weed control applications.

Table 1: Broadleaf Herbicide Activity On Persistent Weeds

	2,4-D	MCPP	DICAMBA	MCPA	2,4-DP	TRICLOPYR	CLOPYRALID	CHLORSULFURON	QUINCLORAC
GROUND IVY	○	☐	●	○	☐	●	☐	○	○
WILD STRAWBERRY	○	○	●	○	☐	●	○	○	○
SPURGE	○	☐	☐	○	○	☐	○	○	○
OXALIS	○	○	☐	○	●	●	○	○	○
CORN SPEEDWELL	○	○	☐	○	○	●	○	○	☐
CREEPING SPEEDWELL	○	○	○	○	○	☐	○	○	☐
WILD VIOLET	○	○	○	○	○	☐	○	○	○
WHITE CLOVER	○	☐	☐	○	○	○	●	☐	○
PROSTRATE KNOTWEED	○	☐	●	○	☐	●	☐	☐	●
YARROW	☐	○	●	○	☐	○	○	○	○

Weed susceptibility, by herbicide reported where ○=resistant, ☐=intermediate, and ●=susceptible.

Table 2: Commonly Used Broadleaf Herbicide Companions For Turfgrass

	2,4-D	MCPP	DICAMBA	MCPA	2,4-DP	TRICLOPYR	CLOPYRALID	BROMOXYNIL	GLYPHOSATE	METHARSENATE
FORMULA 40, WEEDONE LV4, WEEDAR 64, LESCO A-4D	☐									
MCPP 4-AMINE, LESCOPEX, TURFGO MCPP 4K		☐								
2 PLUS 2	☐	☐								
BANVEL			☐							
FOUR-POWER PLUS, SUPER D WEEDONE	☐		☐							
TRIMEC CLASSIC, TRIMEC ENCORE, TRIMEC PLUS, TRIMEC TURF AMINE, TRIMEC TURF ESTER, STRIKE 3, THREE WAY SELECTIVE, TRIMEC BENT, BENT SELECTIVE, TRIPLET, TREXSAN, MEC AMINE-D, MEC AMINE-BG	☐	☐	☐							
TRIMEC PLUS (QUADMEC)	☐	☐	☐							☐
SUPER TRIMEC	☐		☐		☐					
WEEDONE DPC, TURF D-DP	☐				☐					
TRI-POWER		☐	☐	☐						
TRI-ESTER II, TRI-AMINE II		☐		☐	☐					
THREE WAY ESTER, TRI-ESTER, TRI-AMINE, DISSOLVE	☐	☐			☐					
TURFLON, GARLON						☐				
CHASER, TURFLON II	☐					☐				
CONFRONT						☐	☐			
MOMENTUM	☐					☐	☐			
MILLENIUM ULTRA	☐		☐				☐			
COOL POWER, ELIMINATE, HORSEPOWER			☐	☐		☐				