...ON COOL-SEASON TURFGRASSES

Identification, proper cultural practices and efficient herbicide applications are essential in order to control unwanted plants.

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Oh the lowly crabgrass plant: there's never enough of it in an area to make a decent turf, but it is the one grass that can be found just about everywhere.

Crabgrass and other annual grass species often represent a major headache to turf managers in cool, humid regions. This group of species, once germinated, seems to out-compete desirable turfgrasses.

Annual grasses generally become a persistent problem only in sparse turfs with open enough cover to allow young seedlings to germinate and grow. The best management of annual grasses is the proper management of desired turf species. Using cultural practices to promote healthy, dense turf minimizes the need for active annual grass controls.

Annual grass control

The first step to select an appropriate control strategy for any weed is identifying the weed. Once the troublesome pests have been identified as an annual grass, a corrective strategy can be developed.

The primary causes of open, sparse turf are a limiting nutrient(s) (generally nitrogen) or injury due to stress or pest invasion. Therefore, the first strategy in annual grass management is to increase density by proper fertilization.

Other soil properties, such as pH level, soil compaction, and salt and moisture levels, should also be checked. Soil pH can be corrected by adding sulphur or lime; soil compaction may be alleviated with aeration; and soil moisture can be controlled with proper irrigation and/or drainage.

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Figure 1.

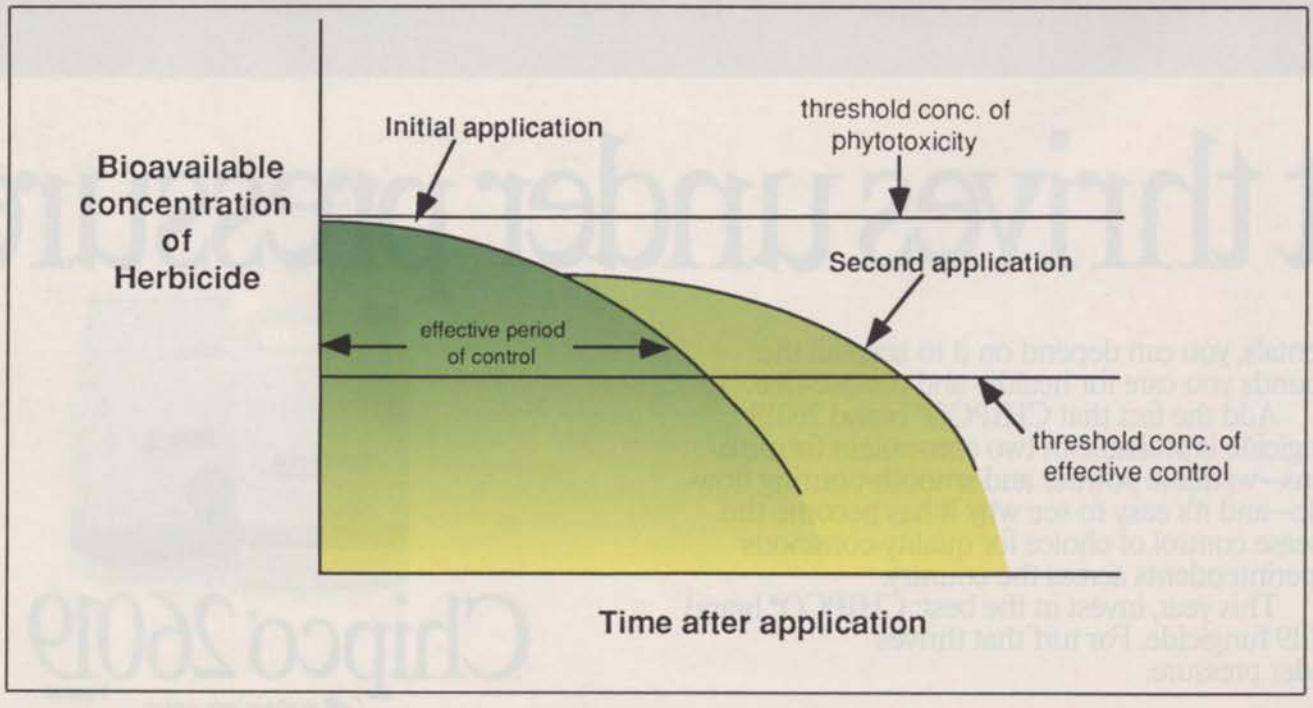

TABLE 1

HERBICIDES FOR CONTROLLING ANNUAL GRASSY WEEDS IN TURF

Always follow the label directions for application rates and proper timing. For extended preemergent control of annual grass weeds, apply a second application 6 weeks after the initial application at ½ the original rate.

Herbicide	Company	Trade Names & Formulations	Weeds controlled: Annual bluegrass	Weeds controlled: Crabgrass, foxtails, barnyard-grass	Weeds controlled: Goosegrass
benefin	Elanco	Balan 2.5G, 85DG	1s	es	..
	Lesco	2.5 Benefin Granular (2.5G)			
bensulide + oxadiazon	Scotts	Goosegrass/Crabgrass Control	1s	es	..
benefin + trifluralin	Elanco	Team 2G	1s	es	..
bensulide	ICI	Betasan 2.9E, 4E, 3.6G, 7G, 12.5G	1s	es	..
	Royalgard	Roysan 4E, 12.5G			
	PBI/Gordon	Betamec 4LF			
	Lesco	Lescosan 4E, 7G			
DCPA	Fermenta	Dacthal 75W	1s	es	es,ej
ethofumesate	Nor-Am	Prograss 1.5 EC	es,1s	..	..
oxadiazon	Rhone-Poulenc	Ronstar 2G, 50WP	1s	es	es
pendimethalin	Scotts	Turfgrass Weed Control 1.71G	1s	es	..
		Weedgrass Control 60DG			
	Lesco	Pre-M 60DG			
siduron	DuPont	Tupersan 50WP		es	..

es—Apply in early spring before weed emergence. 1s—Late Season

Source: Dr. Fermanian

Repairing pest damage as quickly as possible is also necessary to limit annual grass invasion. While these operations will add to your managemant budget, they certainly will help to minimize future pesticide use. While herbicides will still be required, they will be needed less frequently.

Pre-emergence herbicides

With even the best cultural management, annual grasses sometimes present an aesthetic problem.

The seeds of many annual grass species can be viable for many years in the soil. Any herbicide strategy, therefore, must focus on controlling germinating seeds. Pre-emergence herbicides on the market today generally fit this requirement.

(Table 1 lists currently labelled herbicides targeted for annual grass control in cool-season turfs, along with their manufacturing company, trade name and formulations).

Turf managers have a wide range of herbicides available for pre-emergence control of annual grasses. This allows the manager to select a herbicide appropriate for price, longevity and selected turfgrass species. Benefin + trifluralin, bensulide, dacthal, pendimethalin and oxadiazanon are the primary pre-emergence herbicides labelled for use on cool-season turfs.

Determining concentration

All of the herbicides listed are used in a similar manner. An application of the material is made to the targeted turf prior to the generation of the expected annual grass.

The herbicide must develop a chemical barrier within the upper level of the soil. The germinating seedling will then intercept the pesticide and absorb it through the growing shoot and/or root.

For effective control, the concentration of herbicide must be high enough to stop the growth of the intended weed. This minimum concentration is called the threshold of effective control.

If concentrates are too high, they might possibly cause injury to the desirable turf (called the threshold of phytotoxicity). Labelled rates have been developed to provide the maximum concentration that is still safe to use on the listed turf species and therefore provide the longest period of control.

Soil degradation

All pre-emergence herbicides are subject to degradation in the soil, which reduces the concentration of active ingredient available for weed control.

Materials are added to the soil in a concentration that is higher than the threshold of effective control but lower than the threshold of phytotoxicity.

After application, the concentration in the soil slowly dissipates until the level is no longer above the threshold of effective control. At this time, for extended control, a second

TABLE 2

PRE-EMERGENCE CONTROL FOR SELECTED BROADLEAF WEEDS

Apply these herbicides prior to weed seed germination. Read and follow label directions for appropriate turfgrass species, timing, and application rates. The following pre-emergence herbicides are commonly used to control annual grasses in turf. They have also been shown to have some control activity on the broadleaf weeds listed.

Herbicide	Weeds Controlled
DCPA (Dacthal)	spotted and prostrate spurge
pendimethalin (LESCO pre-M, Scotts Turf Weedgrass Control)	prostrate spurge, yellow wood sorrel, knotweed, chickweed, henbit
oxadiazon (Ronstar)	yellow woodsorrel

Source: Dr. Fermanian

application is necessary. For extended control in hot, moist seasons, it is useful to apply a second application of herbicide six to eight weeks after the initial application.

Since some herbicide remains in the soil, the second application can be made at a lower rate which will then boost the total concentration above the threshold for effective control.

This dual application is quite necessary for short residual oversight, such as benefin. Additionally, it allows applications to be made at lower rates, which minimizes the risk of exceeding the threshold of phytotoxicity (see Figure 1). It will help provide equally effective periods of control for all herbicides.

A varied arsenal

The major herbicides used to control crabgrass species and other warm-season annual grasses such as foxtail, barnyardgrass, and others are: benefin, benefin + trifluralin, bensulide, dacthal, pendimethalin and oxadiazon. Siduron is used for controlling crabgrass and other annual grasses during the period of seeding and early turf establishment. Siduron is the only preemergence herbicide that is safe to use in seedling cool-season turfs.

Goosegrass is much tougher to control in cool season turfs and requires higher rates for materials such as dacthal and benefin. Excellent goosegrass control can be obtained with oxadiazon with the same rates used to control crabgrass. As always, the label should be consulted for final instructions on the applications of these materials.

An important consideration in the effectiveness of pre-emergence herbicides is the absorption of the materials to clay particles in the soil. A higher clay content will mean greater absorption, leaving less herbicide available for absorption into emerging plants.

Herbicide labels often instruct the user to apply more material in heavy clay soils to compensate for this process. In lighter, sandy soils, it is necessary to reduce the rate of application to minimize the potential for injury to turf.

Second applications, often at reduced rates, are sometimes necessary to provide season-long weed control.

Secondary benefits

Providing control of annual grasses is the primary use of pre-emergence herbicides. A second benefit is the control of annual broadleaf species. This minimizes the need for post-emergence control of broadleaf annual weeds.

(Table 2 shows the annual broadleaf weeds often controlled with pre-emergence annual grass herbicides).

Spotted and prostrate spurge are often difficult to control once well established, but can be controlled with a pre-emergence application of DCPA or pendimethalin.

The annual broadleaf weed yellow wood sorrel or oxalis is also tough to control. Oxadiazon or pendimethalin can help to minimize or eliminate the germination and development of this troublesome weed.

These are just two examples of annual broadleaf control achieved through the use of an annual grass pre-emergence herbicide. The mechanism for control is similar to that for grasses. However, the timing can be considerably different. It is important to apply the materials prior to the earliest germinating species, grass or broadleaf, and, if necessary, insure thorough season-long control with secondary applications.

Annual/perennial control

Gallery (DowElanco) is a herbicide for controlling a larger group of annual and perennial broadleaf weeds. Gallery can be effective in controlling most broadleaf weeds if applied prior to their germination. Consult the Gallery label for the weeds controlled and the optimum application rate.

Appropriate cultural controls and accurate application of pre-emergence herbicides will minimize annual weeds, minimize herbicide requirements and provide an attractive, weed-free turf. **LM**

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