

PRE-EMERGENCE WEED CONTROL FOR WARM-SEASON TURF

by Clyde Elmore, Ph.D., University of California-Davis



Crabgrass will germinate in open areas of turf.

program, determine the weed species to be controlled using identification aids.

Local university advisors, nurserymen, industry representatives or people at the botanic gardens are available to assist. If there are many species or if perennial weeds are present, a single pre-emergence material will not be adequate.

Choosing a herbicide

Many herbicides are available for warm-season turf. They differ by the weeds controlled, their safety to the various turf species and residual control. Some herbicides (atrazine, simazine and pronamide) also give some post-emergence control.

Pre-emergence weed control is more than applying the right herbicide at the right rate. It requires a knowledgeable turf manager. Often the manager must be able to manage the turf for multiple uses such as recreation, visual effects and athletic events.

Frequently, several species are involved. Knowing cultural practices needed to make the turf vigorous without inviting damage from diseases or other stresses is essential. Management practices are generalized about mowing height and frequency, fertilization amount, and frequency, time of aeration and irrigation. These practices need to be site-specific. Assuming all of the practices are correct, the manager must then think of tipping the balance against weeds.

Before beginning a weed control

	Prostrate Spurge Control	Crabgrass Control
EXCELLENT	Pendimethalin	Bensulide, pendimethalin, oryzalin, trifluralin
GOOD	DCPA	Benefin, siduron, oxadiazon, DCPA, napropamide
FAIR	Oxadiazon, siduron	
POOR	Bensulide, napropamide	

(Based on consistence, length of control, and completeness of control)

Pre-emergence materials form the basis for controlling annual grass and many broadleaf weeds in turf. Once the weeds are controlled and the management practices have been changed to keep the weeds from re-invading, then good vigorously-growing turf can exclude most weeds.

Herbicides are applied in the spring to control summer annual grasses or broadleaves. They are applied in the fall for winter annuals. The germination times of large crabgrass, smooth crabgrass, prostrate spurge, goosegrass or foxtails all differ.

Timing applications

The manager must be able to time the application so the herbicide is in the germination zone at the first germination. One application may not be long enough to control the weeds for the full season, as is often the case in southern California, Texas, Florida, Georgia, etc.

These areas have an exceptionally long weed germination period. Since the soils are warmer and the temperature higher, herbicides degrade faster than in cooler climates. Greater amounts of water increase the loss of herbicides. A second application must be made to have enough herbicide in the germination zone to control all weeds.

The turf manager can affect timing of germination by turf quality. Areas

A familiar construction sight.



Our YFM350 has an incredibly tight turning radius. A virtually maintenance-free shaft drive. An electric start that fires right up. Incredible fuel efficiency. And an impressive towing capacity. No wonder its reputation is building.

YAMAHA
We make the difference.

180 day limited warranty. Warranty terms are limited. See your Yamaha dealer for details. Dress properly for your ride with a helmet, eye protection, long sleeved shirt, long trousers, gloves and boots. Specifications subject to change without notice. Designed for off-road, operator use only. This product is to be used by one person only. Yamaha and the Specialty Vehicle Institute of America encourage you to ride safely and respect fellow riders and the environment. For further information regarding the SVIA rider course, please call 1-800-447-4700. Do not drink and drive. It is illegal and dangerous.

Circle No. 162 on Reader Inquiry Card

Table 1.

Directory of turfgrass pre-emergence herbicides.

Common Name	Trade Name	Formulations	Company
Atrazine	Aatrex	80W,90DG,4L	Ciba-Geigy
Benefin	Purge	4L	Security
	Balan	2.5G	Elanco
Benefin + oryzalin	2.5 Benefin Granular	2.5G	Lesco
	XL	2G	Elanco
Benefin + trifluralin	Team	2G	Elanco
Benefin + oxadiazon	Regalstar		
Bensulide	Betasan	2.9E,4E,7G,12.5G	Stauffer
	Iescosan	4E,7G,12.5G	Lesco
	Pre-san	4E,7G,12.5G	Mallinckrodt
	Bensumec 4LF	4E	
Bensulide + Oxadiazon	Goosegrass/Crabgrass Control	5.25G + 1.31G	Scotts
DCPA	Dacthal	75W	Fermenta
	Dacthal	5G	Lesco
Ethofumsate	Progress	1.5E	Nor-Am
Fenarimol	Rubigan	50W	Elanco
Napropamide	Devrinol	50W,5G	Stauffer
Oryzalin	Surflan	4AS	Elanco
Pendimethalin	Southern Weedgrass Control	2.5G	Scotts
	Turf Weedgrass Control	1.71G	Scotts
	Weedgrass Control	60DG	Scotts
	Pre-M	60DG	Lesco
	Pendimethalin	60DG	Clean Crop
Pronamide	Kerb	50W	Rohm-Haas
Siduron	Tupersan	50W	Du Pont
Simazine	Princep	80W,90DG,4L,4G	Ciba-Geigy

that have bare soil warm up quicker in the spring and weeds germinate in these areas before cooler, tight-growing areas. With good quality turf, the herbicide can be applied later giving better control that lasts longer.

Pre-emergence herbicides are usually used in the early spring for crabgrass (large and smooth), goosegrass, sandbur, foxtails and prostrate spurge.

Knotweed can sometimes be a problem. In the fall of the year, materials are used for annual bluegrass, common chickweed, henbit and speedwells.



Goosegrass should be treated in the early spring with a pre-emergence herbicide.

continued on page 59

Other weeds can be found locally, or are isolated problems. If perennial weeds have been established in the turf and have seeded, then pre-emergence herbicides may be needed to control the germinating seeds of these weeds (Dallisgrass or Bermudagrass for example). The established plants must be controlled by post-emergence herbicides.

Overseeded turf

Overseeding of warm-season grasses is a concern when using herbicides. The pre-emergence material controlling crabgrass or goosegrass must be broken down so annual ryegrass can germinate and establish. Applications of herbicides for annual bluegrass control can be a problem.

Benfen has been used for annual bluegrass control. It can also be applied early in the season (August), giving early control. The ryegrass can be seeded about 45 days later. Bensulide has stunted overseeded ryegrass turf at 45 days. The residual of bensulide is usually two or three times longer than benfen in California turf.

Ethofumesate may be applied 20 to 30 days after overseeding. It should be applied to dormant Bermuda or suppression can occur in the spring.

Fenarimol, a fungicide, applied two weeks prior to overseeding, controls several turf diseases in addition to controlling the annual upright form of annual bluegrass. It has not controlled the low-growing perennial form in mild climate areas.

Careful water management going into the fall will help reduce annual bluegrass invasion. Conditions that allow alternate wetting (rainfall or irrigation) and drying, so the seedlings

Not a ground breaking idea.

Unlike most golfers, our YFM225 won't tear turf. Fleece fairways. Or bash bunkers. Because we've equipped it with high-flotation tires that leave virtually no footprints. (A slightly overweight caddie would leave a deeper footprint.) **YAMAHA** The YFM225. You'll never make a hole in one. We make the difference.

180 day limited warranty. Warranty terms are limited. See your Yamaha dealer for details. Dress properly for your ride with a helmet, eye protection, long sleeved shirt, long trousers, gloves and boots. Specifications subject to change without notice. Designed for off-road, operator use only. This product is to be used by one person only. Yamaha and the Specialty Vehicle Institute of America encourage you to ride safely and respect fellow riders and the environment. For further information regarding the SVIA rider course, please call 1-800-447-4700. Do not drink and drive. It is illegal and dangerous.

Circle No. 163 on Reader Inquiry Card

can dry out and die, will decrease weed populations.

Mechanical cultivation

Also, timing of aeration or other mechanical cultivations is important. Aeration or verticutting during annual bluegrass germination allows

Table 2.

Tolerance of Warm-Season Turf to Pre-emergence Herbicides

Herbicide	Bahia	Bermuda	Centipede	St. Augustine	Zoysia
Atrazine	NR	I	T	T	I
Benfen	T	T	T	T	T
Benfen*oryzalin	T	T	T	T	T
Benfen*trifluralin	T	T	T	T	T
Bensulide	T	T	T	T	T
Bensulide*oxadiazon	NR	T	NR	NR	T
DCPA	T	T	T	T	T
Ethofumesate	NR	I	NR	NR	NR
Napropamide	T	T	T	T	TR
Oryzalin	T	T	T	T	T
Oxadiazon	NR	T	NR	T	T
Oxadiazon*benfen	NR	T	NR	NR	T
Pendimethalin	T	T	T	T	T
Pronamide	NR	T	NR	NR	NR
Siduron	NR	NR	NR	NR	NR
Simazine	NR	T	T	T	T

T = tolerant; I = Intermediate tolerance, apply only to dormant grass
NR = Not registered

	Pre-emergence Herbicide Soil Longevity
SHORT	benfen, DCPA, siduron
MEDIUM	oxadiazon, trifluralin
LONG	bensulide, pendimethalin, oryzalin

(Based on turf use and rates used in turf)

open spaces in the turf for weeds to invade.

Always aerate or verticut before—an application of pre-emergence herbicide. These operations just before herbicide treatment will reduce the thatch and give the herbicide a better chance to get to the soil where it is effective.

Pre-emergence herbicides, when properly timed at the right rate, can effectively control most annual weeds and be a good tool to help manage turf. They generally are safer to use on turf than post-emergence herbicides because they are being used to control seedlings rather than mature plants. There are many good materials from which to select to control your weeds. **LM**