



# Herbicide Approach for Weeds

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**A**RE HERBICIDE applications necessary to maintain a good quality turf on greens, tees, and fairways? Think back to the time when bermudagrass greens contained more annual bluegrass (*Poa annua*) than either bentgrass or overseeded cool-season grasses, when annual weeds dominated the fairway turf. Fertilization and other management practices definitely influence weed populations, but herbicide usage has proven itself necessary in the overall program for maintaining a quality turf.

Several factors must be considered in choosing a herbicide. First, the chemical must be selected for the specific weed under consideration, not simply because it is a weed killer. Secondly,

treatments must be applied at the correct date and rate for effective control, and, third, in some cases repeated treatments are as necessary as choosing the correct herbicide. Having a weed-free turf does not happen by accident; it requires careful selection, planning and execution of all seasonal-herbicide treatments.

## WINTER ANNUAL CONTROL

Winter annual weeds are found in most dormant turfgrass areas throughout the southeastern United States. They become evident during the winter and early spring where mild winter temperatures occur. To prevent this undesirable appearance, and also to prevent these weeds from



Figure 1. Spiny stickers on seed pods of spur weed.

delaying spring green-up of the warm-season grasses, the weeds should be eradicated.

The selection of herbicides for postemergence control of different weed species common in the Southeast is shown in Table 1. These results indicate that in most instances, weed species should be identified before selecting a herbicide treatment. A single paraquat treatment completely controlled annual bluegrass and common chickweed (*Stellaria media*), and 82 and 91 percent of corn speedwell (*Veronica arvensis*) and spur weed (*Soliva sessilis*), respectively. However, two applications were required for acceptable henbit (*Lamium amplexicaule*) and parsley-piert (*Alchemilla microcorpa*) control. A single 2,4-D + MCPP + dicamba treatment satisfactorily controlled common chickweed and spur weed, but two treatments were needed for acceptable henbit and parsley-piert control. Since corn speedwell was not satisfactorily controlled with 2,4-D + MCPP + dicamba, a different herbicide should be used when this weed is present. Metribuzin was the only herbicide that controlled all six weeds in this study with a single application. It may not be necessary to obtain complete control of all weeds in order for a chemical to be acceptable. However, there are exceptions and spur weed is one that the chemical must control completely because of the many sharp spiny stickers on its seed pods (Figure 1).

#### SUMMER ANNUAL WEEDS

Crabgrass (*Digitaria sanguinalis*) and goosegrass (*Eleusine indica*) are major weeds that invade bermudagrass and other turfgrass areas during late spring and summer. When weeds are not controlled, they will compete with turfgrass for moisture and nutrients and this usually results in

TABLE 1  
Postemergence Herbicide Treatments on Control of Winter Annuals in Dormant Bermudagrass.

Herbicide	Treatments		% Weed Control					
	Rate	Appli- cation	Annual Bluegrass	Corn Speedwell	Common Chickweed	Henbit	Parsley- piert	Spur Weed
	lb/A	No.	0 to 100 (100 = best)					
2,4-D + dicamba	1+.5	1	0	32	100	75	82	89
		2	0	60	100	98	95	98
2,4-D + MCPP + dicamba	1+.5+.1	1	0	27	96	64	46	88
		2	0	63	100	93	76	100
Bromoxynil	0.5	1	0	14	10	28	88	23
		2	0	47	31	81	100	85
Paraquat	0.5	1	100	82	100	57	61	91
		2	100	100	100	99	98	100
Metribuzin	0.5	1	100	99	100	100	99	91
		2	100	100	100	100	100	100

Treatments were applied at the given rates for each of 1 or 2 applications. First application was generally applied in February and second application 2 weeks later. Data are averages from 3 or more experiments.

low-quality turf. Selected preemergence herbicides applied in early spring will satisfactorily control both of these weeds in bermudagrass turf (Table 2). It is important, however, to apply the treatment prior to the germination of the weed seed. Crabgrass usually germinates after mid-March and goosegrass after mid-April in the Piedmont Region of Georgia, where these studies were conducted. Both weeds will germinate earlier in southern locations and later in northern locations. Bensulide and oxadiazon treatments controlled the highest percentage of crabgrass when applied in mid-March. The control was reduced slightly when treatments were applied in February and greatly reduced when applied in April or May. The poor

control from April and May treatments indicated that crabgrass seed had germinated prior to the preemergence treatments. These results indicate that it is better to apply preemergence treatments a little earlier than later for crabgrass control.

Neither DCPA nor benefin applied as a single treatment controlled crabgrass satisfactorily regardless of dates of treatment. In a separate study, crabgrass was controlled satisfactorily when benefin was applied in March followed by a second application in May. DCPA failed to give consistent control from repeated treatments.

Oxadiazon was the only herbicide that controlled goosegrass satisfactorily (Table 2). Although the control was the highest from April



Figure 2. Turf on the right was treated with DCPA for four years compared with untreated turf on the left side. Upper: Tifway. Lower: Tifgreen.



**TABLE 2**  
**Dates of Herbicide Treatments on**  
**Control of Crabgrass and Goosegrass**  
**in Bermudagrass.**

Treatments		% Weed Control	
Herbicide	Date	Crabgrass	Goosegrass
		0 to 100 (100 = best)	
DCPA	Feb.	60	15
	Mar.	57	32
	Apr.	33	16
	May	17	10
Bensulide	Feb.	80	10
	Mar.	93	23
	Apr.	71	24
	May	46	5
Benefin	Feb.	60	50
	Mar.	65	39
	Apr.	51	41
	May	37	41
Oxadiazon	Feb.	83	76
	Mar.	90	82
	Apr.	46	93
	May	15	83

Treatments were applied at mid-month and data are averages from 6 experiments for crabgrass and 3 experiments for goosegrass.

treatment, the control was not reduced greatly from earlier or later dates of treatment. Oxadiazon should not be applied to bermudagrass greens, but it can be used around greens, tees and on fairways.

When herbicides are applied annually for summer weed control, the turfgrass tolerance may differ with varieties. After four consecutive years of treatment with DCPA, Tifway bermudagrass was not injured, whereas Tifgreen had moderate injury in the spring (Figure 2). This indicates the need to know the effects of chemicals on the desirable turfgrasses as well as on weeds.

Emerged crabgrass can be readily controlled with repeated MSMA treatments. However, the treatment will not give consistent goosegrass control. Recent tests showed that Metribuzin controlled goosegrass almost completely when applied at 0.5 pound per acre in each of two applications (Table 3). In some years the control was just as good from one application at 0.5 pound per acre rate, or two applications at 0.25 pound per acre per treatment. Results, however, were not consistent from year to year. Preliminary results indicate that two applications of MSMA + metribuzin at 2.0 + 0.12 pound per acre per treatment control goosegrass better than MSMA alone and just as good as metribuzin applied alone at the higher rates. Goosegrass control from the combination treatment is shown in Figure 3. The advantage in using the combination treatment is that there is less bermudagrass injury than when treated with higher metribuzin rates.

Spotted-spurge (*Euphorbia maculata*) is often found in bermudagrass and strongly competes with the grass throughout the summer. In a pre-

Figure 3. MSMA + metribuzin controlled goosegrass in left plot compared with untreated turf on the right.



liminary study it was found that a single treatment of metribuzin (0.5 pound per acre) or 2,4-D + silvex + dicamba (1.0 + 0.5 + 0.1 pounds per acre) resulted in excellent spotted-spurge control (Table 4). None of the other treatments (2,4-D + dicamba, 2,4-D + MCPP + dicamba, or dicamba) satisfactorily controlled the weed with a single application. The 2,4-D + silvex + dicamba treatment severely injured the bermudagrass stand and resulted in 27 percent loss one month after treatment. Metribuzin caused initial yellowing of the turf, but the grass fully recovered within three weeks. This indicates that 2,4-D + silvex + dicamba should not be applied to actively growing bermudagrass because severe injury is surely to result. It is also possible that

metribuzin applied at rates lower than 0.5 pound per acre may result in acceptable control; however, it should be remembered that these data are not complete.

These results indicate that it is important to identify weed species before selecting a herbicide for weed control in dormant or actively growing bermudagrass turf. When preemergence treatments are used, choosing correct dates of application are also important to obtain maximum weed control performance from the herbicides used.

*Editor's Note:* Metribuzin is non-selective, and therefore not recommended for use on cool-season grasses.

**TABLE 3**  
**Postemergence Herbicide Treatments on Control of Goosegrass and Crabgrass in Bermudagrass.**

Treatments		% Control	
Herbicide	Rate	Goosegrass	Crabgrass
	lb/A	0 to 100 (100 = best)	
MSMA	2.0	58	93
Metribuzin	0.25	66	47
	0.5	98	87
MSMA + Metribuzin	2.0+0.12	98	a

Treatments were applied in 2 application rates at one week interval in August. Data are averages from 3 or more experiments.

<sup>a</sup>Crabgrass control would be equal to or higher than MSMA applied at 2.0 lb/A alone.

**TABLE 4**  
**Effect of Postemergence Herbicide Treatments on Spotted-Spurge Control in Bermudagrass: A Preliminary Report.**

Treatments		
Herbicide	Rate	% Spotted-Spurge Control
	lb/A	0 to 100 (100 = best)
2,4-D + dicamba	1.0+0.3	61
2,4-D + silvex + dicamba	1.0+0.5+0.1	98
2,4-D + MCPP + dicamba	1.0+0.5+0.1	59
Dicamba	1.0	50
Metribuzin	0.5	100

Data are preliminary and represent a single treatment from only one year.



## Charles B. White

Charles (Bud) White was appointed Southern Region agronomist in December. He has just completed his Masters thesis at Clemson University in the Department of Horticulture under the direction of Dr. A. Robert Mazur. He has had eight years experience working at golf courses in North Carolina, thereby providing an excellent balance of experience and education in the field of fine turfgrass culture. He is eminently qualified in the science of golf turfgrass maintenance and management.

Effective January 1, 1979, the National Director and Northeastern Region offices will be located at the United States Golf Association headquarters, Golf House, Far Hills, New Jersey 07931. Telephone, (201) 766-7770.