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Does Vertical Mowing Encourage Emergence of Weeds in Bermudagrass Turf ?

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Thatch in a fine-leaf bermudagrass [Cynodon dactylon (L.) Pers.] turf is a major problem for most homeowners and turfgrass managers. It is an accumulation of dead but undecomposed stems and leaves at the soil surface. A build-up of thatch usually causes scalping during mowing and results in a poor quality turf.

To prevent thatch accumulation, turf can be dethatched or vertically mowed (5, 6). Vertical mowing is done with a machine to remove dead grass parts from dormant or actively growing turf. Individual blades are spaced from 2.5 to 4 cm apart and usually set to groove the soil surface. The depth of mowing will determine the amount of thatch removed. The question often arises as to what extent vertical mowing will disturb weed seed during this operation and permit the seed to germinate.

Procedure

Vertical mowing treatments of 0, 1, 2, and 3 times per year were conducted at Experiment, Georgia from 1973 to 1976 on established Tifgreen bermudagrass turf. Approximate times of treatment were February 20 for one, February 20 + July 15 for two, and February 20 + June 18 + July 15 for three mowings.

DCPA (Dacthal) was applied in March, followed by repeated treatments in selected plots in June and July. The March treatments were applied after plots were vertically mowed and prior to crabgrass germination, however, June and July treatments were not always applied before the vertical mowing treatments. All DCPA treated plots received a final treatment in October. Untreated plots were also maintained without herbicides for comparison of vertical mowing on weed population in bermudagrass turf.

Weed control ratings were based on percent ground cover with 0 = complete control. Crabgrass [Digitaria sanguinalis (L.) Scop.] ratings were made in August while ratings for brome grass (Bromus spp.), annual bluegrass [Poa annual (L.)], common chickweed [Stellaria media (L.) Cyrillo], and henbit (Lamium amplexicaule (L.)) were made in March. All treatments were arranged in a split-plot design with vertical mowing as main plots and DCPA treatment as subplots with four replications. All data were statistically analyzed and portions of the data were previously published (1).

Results and Discussion

Summer weeds. Vertical mowing treatments significantly increased crabgrass population in bermudagrass turf after the initial year of treatment. Weeds were not present in 1973 in

any the treated or untreated plots, but crabgrass numbers were increased significantly from vertical mowing the following years, 1974 through 1976 (Table 1). Crabgrass populations were, similar at all frequencies of vertical mowing. There were no weeds in the test area in 1977 after vertical mowing was discontinued. Since vertical mowing treatments thin the turf this allows weed seed to germinate when herbicides are, not applied for weed control.

DCPA applied in sequence with vertical mowing treatments resulted in satisfactory crabgrass control in 1974, but not in 1975 or 1976 (data not shown). This occurred regardless of repeated treatments during the spring and summer. The inconsistent control with DCPA is in agreement with previous results (3). Therefore, it is necessary to select a herbicide that will give consistent crabgrass control when bermudagrass is vertically mowed each year. Studies completed in Georgia indicate bensulide (Betasan) or oxadiazon (Ronstar) will provide consistent control from a ????

Winter weeds. Brome grass numbers were increased in repeated vertically mowed plots when compared to single mowed or unmowed plots in 1977 after four consecutive years of treatment (Table 1). Brome grass was not present in sufficient numbers for rating during the first 3 years of the study. However, by the fourth year, population had increased to an acceptable level for rating.

DCPA treatments did not control brome grass nor were there any differences from combinations of DCPA and vertical mowing.

Vertical mowing during the spring and summer did not affect populations of annual bluegrass, common chickweed or henbit the following winter. DCPA did not control annual bluegrass (data not shown) which is in agreement with previous results (2). However, fall applied DCPA controlled common chickweed and henbit completely which agrees with previous results (1).

These results indicate that when vertical mowing is used to remove thatch in bermudagrass turf, herbicides are needed for consistent crabgrass control. Vertical mowing in the summer did not influence the population of winter weeds as severely as summer weeds.

Table 1. Effect of vertical mowing treatments on the population of crabgrass and brome grass in Tifgre en bermudagrass turf.

Weed population ^a				
	Crabgrass			Brome grass
Treatments	1974	1975	1976	1977
No./yr.	% ground cover			
0	0b ^b	3b	4b	11b

1	5a	43a	65a	15b
2	3a	34a	59a	32a
3	5a	37a	53a	29a

a - Ratings based on percent ground cover where 0 = complete control. Crabgrass ratings were made in August or September and brome grass ratings were made in February or March.

b - Values followed by a common letter within columns are not significantly different according to Duncan's multiple range test at 5% level.

Literature Cited

1. Johnson, B.J. 1979. Vertical mowing and herbicide treatments on thatch in bermudagrass (*Cynodon dactylon*) turf. *Weed Sci.* 27:14-17.
- 2 Johnson, B.J. 1977. Controlling winter annuals with herbicides. *Ga. Res. Bul.* 206:1-35.
3. Johnson, B.J. 1977. Sequential DCPA treatments for weed control in turfgrasses. *Agron. J.* 69:396-398.
4. Johnson, B.J. 1977 Crabgrass and goosegrass control in bermudagrass with herbicides *Ga. Res. Bul.* 195 :1-29.
5. McWhirter, E.L., and C. Y. Ward. 1976. Effect of vertical mowing and aerification on golf green quality *Miss. Agric. Forestry Exp. Sta. Res. Rep* 2(12).
6. Thompson, W.R. Jr. and C.Y. Ward. 1966. Prevent thatch accumulation of Tifgreen bermudagrass greens. *The Golf Supt.* 34(9): 20 and 38.

Georgia Station research agronomist B. J. Johnson (below) has been studying ways to rid Georgia's turf of weeds, including those shown below: crabgrass, chickweed and henbit.

