Chemicals Control St. Augustine Grass In Bermudagrass Turf In Texas Tests

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Most all lawns and parks in the Corpus Christi, Texas, area are composed of St. Augustine grass. Though subject to disease and chinch bugs, by and large it is satisfactory for these purposes.

St. Augustine, however, is definitely not desirable as a golf course turf. Where it has accidentally become established on bermudagrass fairways or tee areas, as is common in older golf courses, it poses several problems. It gives an uneven, patchy appearance. More important, it greatly slows down the forward progress of a golf ball. St. Augustine grass is so coarse and tough as to often interfere markedly with proper execution of a golf shot. It is a strong competitor and ultimately may crowd out bermuda and other grasses. This characteristic is desirable in lawns and parks, but is a problem in golf courses.

To date, the only eradication methods have been either to dig out the area containing the St. Augustine or to kill the area with a non-selective herbicide and to reseed with bermuda. Neither is effective. Both leave unsightly denuded areas that tend to become weedy before the reseeded bermuda is established. Moreover, digging out large areas and reseeding is expensive and time-consuming. The practice also normally fails because any remaining sprig of St. Augustine can serve as the beginning of another patch. Further, in non-selective killing, many of the St. Augustine runners which have crept far out into the bermuda often are missed with the treatment because of hesitancy to destroy more turf than is absolutely necessary.

A selective weed-killer would appear to be the answer to this problem. A discussion of tolerances of bermuda, St. Augustine, and several other grasses for the methylated arsenicals (Callahan, L. M., *Turfgrass tolerances do differ*, WEEDS, TREES, AND TURF, Nov. 1966) indicates that one or more of these materials might be sufficiently effective in killing St. Augustine without being unduly destructive to bermuda.

Therefore, investigations were begun involving the effects of 3

Tiff Green-St. Augustine plot showing several treated rows. Row in left center received 1 overall and 2 spot applications of MSMA and shows no St. Augustine grass. Row in right center received 1 overall and 2 spot applications of AMA and shows several St. Augustine plants. Details on this and in succeeding pictures will be found in Tables 1 and 2 on page 24 of the sod industry section.

Rows from Jean Tiff-St. Augustine plot. Row on the left had 1 over-all and 2 spot applications of MSMA. Shows no St. Augustine plants and about 70% regrowth of bermudagrass. Center row had 1 over-all and 2 spot applications of Calar. Shows several St. Augustine plants and approximately 70% regrowth. Right row is untreated control.

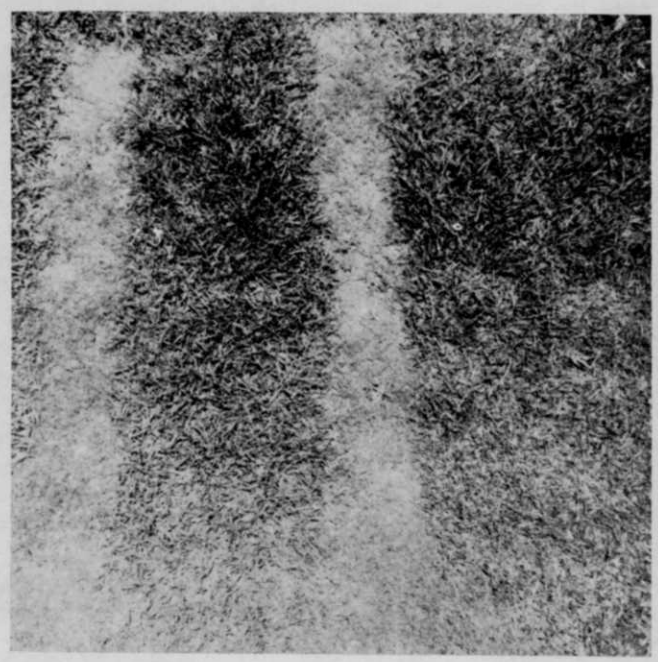

TABLE I. Number* of leaves of St. Augustine grass remaining 3 weeks after each application (numbers 50 and over are approximate)

CHEMICAL	DILUTION	TIFF GREEN-ST. AUGUSTINE PLOT			JEAN TIFF-ST. AUGUSTINE PLOT			COMMON BERMUDA-ST. AUGUSTINE PLOT	
		OVERALL APPLICATION	1ST SPOT APPLICATION	2ND SPOT APPLICATION	OVERALL APPLICATION	1ST SPOT APPLICATION	2ND SPOT APPLICATION	OVERALL APPLICATION	SPOT APPLICATION
MSMA	2 oz	200	36	0	100	16	0		0
MSMA	2 oz	400	200	0	500	16	0		
MSMA	4 oz	150	32	0	150	33	16(< actual)		0
MSMA	4 oz	100	50	0	150	0	0		
CALAR	2 oz	400	150	13	350	100	6(1 actual)		0
CALAR	2 oz	400	100	18	150	50	0		
CALAR	4 oz	350	100	42	200	34	0		0
CALAR	4 oz	400	100	0	250	45	0		
AMA	2 oz	600	450	150	600	50	0		42(14 actual)
AMA	2 oz	numerous	300	150	500	16	0		
AMA	4 oz	numerous	100	10	400	0	0		0
AMA	4 oz	numerous	100	0	850	50	0		

*corrected; a corrective factor was employed in each case to adjust actual counts because the volunteer St. Augustine grass was not uniform throughout any of the plots.

TABLE II. Approximate % regrowth* of bermudagrass varieties 2 months after 1st (overall) application of chemicals in the case of Tiff Green and Jean Tiff, and 1 month after 1st (overall) application in the case of common bermudagrass

CHEMICAL	DILUTION	TIFF GREEN-ST. AUGUSTINE PLOT	JEAN TIFF-ST. AUGUSTINE PLOT	COMMON BERMUDA-ST. AUGUSTINE PLOT
MSMA	2 oz	60	60	30
MSMA	2 oz	50	20	
MSMA	4 oz	40	30	10
MSMA	4 oz	30	40	
CALAR	2 oz	50	60	40
CALAR	2 oz	50	40	
CALAR	4 oz	70	80	40
CALAR	4 oz	60	30	
AMA	2 oz	70	80	30
AMA	2 oz	60	80	
AMA	4 oz	70	60	20
AMA	4 oz	70	50	

*corrected; a correction factor was employed in each case to adjust actual readings because the volunteer St. Augustine grass (and, thereby, the burmudagrass variety) was not uniform in any of the plots.

methylated arsenicals (Calar, AMA, and MSMA)* on volunteer St. Augustine grass. Three plots were set up at the turf nursery at Oso Beach Municipal Golf Course in Corpus Christi in March, 1967. One plot was composed of common bermudagrass (widely-used in this area for fairways), another of Tiff Green bermudagrass (widely-used in this area for tees and greens), and the last of Jean Tiff bermudagrass (formerly used for tees and greens). All plots contained much volunteer St. Augustine grass. Two different dilutions of each of the 3 chemicals were used and were applied along one-foot rows with a 2-gallon knapsack sprayer. The plots made up of Tiff Green bermuda-St. Augustine and Jean Tiff bermuda-St. Augustine each contained one replication of each treatment and 3 control rows. The common bermuda-St. Augustine plot was small and no replications were possible; there were 2 control rows.

The chemicals were applied in all cases to recently soaked turf approximately 2" high in sunny afternoons in mid-and late spring. Air and soil temperatures were measured before each application. The air temperature varied from 74° to 88°F. No temperature effects were noted or studied. The Tiff Green bermuda-St. Augustine and Jean Tiff bermuda-St. Augustine plots had 3 applications (one over-all and two spot treatments). The 1st spot treatment was made approximately 2 weeks after the over-all application, and the 2nd spot treatment was made approximately one month after the 1st spot treatment. The common bermudagrass-St. Augustine plot had only 2 applications (one over-all and one spot treatment), the spot treatment being made about 2 weeks after the over-all treatment. The rate of application of each material was 1 gal/150 square feet of turf or to the extent that the foliage was thoroughly soaked and dripping. The 2 dilutions employed were 2 oz./150 square feet and 4 oz./150 square feet. All plots were fertilized approximately 1 week after the first (over-all) application with Pro-Turf (5-2-0) Houactinite activated sludge fertilizer at the rate of 80 lbs./200 square feet of turf, using a fertilizer spreader for even application, and sprinkled thoroughly immediately. All plots were well cared for, but were mowed much less frequently than golf course turf customarily is.

Results of all tests are given in Tables 1 and 2. A summary of results shows that all 3 chemicals have a marked selective killing effect on St. Augustine grass. Each has a temporary burning effect on bermudagrass with MSMA causing the most burning, especially at the higher concentration. From these experiments MSMA at both dilutions in all but one case** seems to give 100% destruction of St. Augustine grass. Although severe burning of all 3 burmudagrass varieties occurred with MSMA

*Calar (or Super Dal-E-Rad) = 10.3% calcium acid methyl arsonate AMA (or Super Crab-E-Rad) = 8.0% octylammonium methyl arsonate plus 8.0% dodecylammonium methyl arsonate
MSMA (or Weed-E-Rad-W) = 35.33% monosodium acid methanearsonate (all products of Vineland Chemical Co., Vineland, New Jersey)

**As will be noted from Table 1, in one case (Jean Tiff) 2 leaves (one plant) remained after all 3 applications. It appears likely that this one plant was missed with the spray material.

at both dilutions (especially at 4 oz./150 square feet), complete and permanent killing did not occur. As will be noted from Table 2, in the rows treated with MSMA in the Tiff Green and Jean Tiff plots the burmudagrass had filled in on the average of 40% within 2 months. In the common bermudagrass plot it had filled in 20% in 1 month. In all test rows involving all 3 chemicals at both dilutions bermudagrass regrowth appeared healthy and apparently would soon cover 100%.

In all control rows both St. Augustine and bermudagrass grew abundantly and no disease or insect infestations were noted anywhere in the plots.

As can be seen further from Table 1, both Calar and AMA gave virtually 100% destruction of St. Augustine grass in the Jean Tiff and common bermudagrass plots, but did not do so in the Tiff Green plot. All plots were treated the same and were nearby, although not adjacent, so that environmental conditions from plot to plot were considered almost identical. Both Calar and AMA gave less burning of bermudagrass than did MSMA, and, as can be noted from Table 2, regrowth of bermudagrass was faster with these than in rows treated with MSMA.

Row from Jean Tiff-St. Augustine plot, showing results of 1 overall and 2 spot applications of Calar. One St. Augustine plant (with approximately 10 leaves) can be seen in the foreground.

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