

## **Turf Conversion Using Seeded Zoysia and Bermuda Without Nonselective Herbicides**

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### **Objective**

Determine if bermudagrass and zoysiagrass can be overseeded effectively into an existing cool-season turf, and if so, at what seeding rates and with or without using non-selective herbicides.

### **Rationale**

Historically, bermudagrass and zoysiagrass have not been widely used on golf courses and athletic fields in the transition zone. Labor requirements and expense of vegetative establishment limited widespread use of these grasses. Fortunately, improved seeded bermudagrass and zoysiagrass varieties have become available in the last few years increasing their feasibility for more athletic fields and golf courses. Lost revenues during the renovation process, slow establishment of zoysiagrass, novelty of seeded bermudagrass and zoysiagrass, and lack of research have made golf course superintendents and owners hesitant to renovate to seeded bermudagrass or zoysiagrass. Further research in conversion methods will enable managers to take advantage of these new seeded varieties.

### **How It Was Done**

In 2000 and 2001 experiments were initiated on established perennial ryegrass stand with a mowing height of 0.75 in. Separate experiments were conducted on bermudagrass and zoysiagrass with each experiment replicated three times. Experimental design for each study was a 2 X 3 factorial with two herbicide treatments and three seeding rates. Herbicide treatments were glyphosate or no glyphosate. Four days following the glyphosate application all plots were core aerified and verticut in two directions. Bermudagrass was seeded on 23 May 2000, 30 May 2001 and 15 June 2001 at 0.5, 1.0 and 1.5 lbs pure live seed (PLS)/1000 ft<sup>2</sup> and zoysiagrass was seeded on the same dates at 1.0, 2.0 and 3.0 lbs PLS/1000 ft<sup>2</sup>. Plots were fertilized with 1.0 lb N/1000ft<sup>2</sup> after seeding and again monthly during the summer and irrigated frequently to promote germination. One week after seeding, mowing heights were reduced to 0.5 inches with a reel-type mower and kept at that height for the remainder of the experiment. Data was collected visually as percent cover and using the line-intersect method.

### **Results**

- Both seeded zoysiagrass and bermudagrass require little or no competition to establish successfully and full zoysia and bermudagrass establishment only occurred in plots treated with glyphosate prior to seeding (Tables 1, 2 and Figure 1). Even when seeding rates were increased, adequate establishment was never achieved without the use of glyphosate prior to seeding.
- Seeding zoysiagrass at 3.0 lbs PLS/1000 ft<sup>2</sup> after glyphosate application always resulted in greatest establishment, but the 3.0 lb seeding rate never produced significantly greater cover than the 2.0 lb seeding rate (Table 1). However, there were differences in cover between the 3.0 lb and the 1.0 lb zoysiagrass seeding rates.

- Seeding bermudagrass at 1.5 lbs PLS/1000 ft<sup>2</sup> with the use of glyphosate optimized establishment in 2001 and was significantly higher than establishment with the lower seeding rates, but no significant differences in establishment occurred between seeding rates in 2002 when using glyphosate prior to seeding (Table 2).

**Table 1.** 15 Oct fairway conversion ‘Zenith’ zoysiagrass mean backtransformed percent cover.

Seeding rate (lbs/1000ft <sup>2</sup> )	2001			2002(a)			2002(b)		
	Herbicide			Herbicide			Herbicide		
	glyphosate	none	mean	glyphosate	none	mean	glyphosate	none	mean
	-----backtransformed percent cover-----								
1	21	1	11 a <sup>†</sup>	98	1	50 b	44	0	22 a
2	29	1	15 a	100	1	51 a	74	1	37 a
3	37	1	19 a	100	2	51 a	77	0	39 a
mean	29	1		99	1		65	0	
<u>ANOVA</u>									
Source of variation	df								
Rate (R)	2	NS		**			NS		
Herbicide (H)	1	**		**			**		
R x H	2	NS		*			NS		

\*, \*\* Significant at the 0.05 and 0.01 probability levels, respectively.

<sup>†</sup> Within columns, means followed by the same letter are not significantly different according to LSD (0.05).

**Table 2.** 15 Oct fairway conversion ‘Mirage’ bermudagrass mean backtransformed percent cover.

Seeding rate (lbs/1000 ft <sup>2</sup> )	2001			2002(a)			2002(b)		
	Herbicide			Herbicide			Herbicide		
	glyphosate	none	mean	glyphosate	none	mean	glyphosate	none	mean
-----backtransformed percent cover-----									
1	93	1	47 a <sup>†</sup>	100	16	50 a	100	11	56 a
2	97	1	49 a	100	18	51 a	100	14	57 a
3	99	1	50 a	100	27	51 a	100	14	57 a
mean	96	1		100	21		100	13	

ANOVA

Source of variation	df			
Rate (R)	2	NS	NS	NS
Herbicide (H)	1	**	**	**
R x H	2	NS	NS	NS

\*, \*\* Significant at the 0.05 and 0.01 probability levels, respectively.

<sup>†</sup> Within columns, means followed by the same letter are not significantly different according to LSD (0.05).



**Figure 1.** Successful zoysiagrass establishment (2002a) can be seen only in plots treated with glyphosate prior to seeding.