

Zoysiagrass Cultivar Management Study - 1998**M.H. Hall, R.H. White, J.E. Gaudreau, W.G. Menn, and G.R. Taylor****Abstract**

On May 7, 1996, 6 zoysiagrass (*Zoysia* spp) cultivars were planted in College Station, Texas. Genotypes used included Meyer, El Toro, Crowne, and Palisades, which are medium to coarse textured, as well as Emerald and Cavalier, which are fine textured. After most plots were established, nitrogen fertility was differentially applied in the form of 21-0-0 at the rates of 0.25, 0.5, or 1.0 lbs N per 1000 sq ft per month during the growing season. Mowing height differentials were imposed in August 1996, and included cutting heights of 0.75 inches via a reel-type mower, and 1.5 inches with a walk behind rotary mower. Plots were rated visually for spring greenup on 24 March, 1998, and there were no significant differences between cultivars or fertility rates, but plots mowed at 0.75 in. were greener than those mowed at 1.5 in. When the plots mowed at 0.75 inch were rated monthly for quality, there were usually no statistical differences in turf quality between cultivars, except that Meyer was often rated in the lowest statistical group, and the other cultivars were in the highest statistical group. The same relationship held true for the overall seasonal average for turf quality. At the 1.5 inch mowing height, there were quality differences between cultivars on almost every rating date. Meyer was in the lowest statistical group on each date and overall. Both Cavalier and Emerald, as well as Meyer, exhibited better quality at the lower mowing height than at the 1.5 in. height. Mowing height had no effect on quality among the other cultivars.

At the 0.75 in. mowing height, the highest (1.0 lbs N per 1000 sq. ft. per month) fertility level produced the highest quality turf. At the 1.5 in. mowing height, the highest fertility level produced the highest quality turf except for Emerald, which produced turf of similar quality regardless of fertility level. All other cultivars exhibited better fall color than Meyer, and Emerald was greener than El Toro.

Introduction

This report summarizes ratings for the third growing season of a study containing 6 zoysiagrass (*Zoysia* spp.) cultivars subjected to differential nitrogen fertility rates and mowing heights, at the Texas A&M University Turfgrass Field Laboratory in College Station, Texas.

Materials and Methods

Several months prior to planting, an area of sandy loam soil was fumigated with methyl bromide. Soil pH was approaching 9 because of past use of sodic irrigation water compounded by drought conditions. Immediately before planting, a rotary tiller was used to loosen the rootzone, and a complete fertilizer (13N-13P₂O₅-13K₂O) was applied at a rate of 1 lb nutrient per 1000 sq ft. Plots were replicated 4 times in a randomized split block design and planted 7 May, 1996. Several weeks after planting, mowing was initiated with a walk-behind rotary mower at a cutting height of 2.5 inches. The percentage of each plot covered was rated visually throughout the first growing season and is

reported in the 1997 report (Hall, et al, 1997).

After establishment, nitrogen fertility was differentially applied in the form of 21-0-0 at the rates of 0.25, 0.5, or 1.0 lbs N per 1000 sq ft per growing month. Mowing height differentials were imposed in August 1996, and included cutting heights of 0.75 inches via a reel-type mower, and 1.5 inches with a walk behind rotary mower.

Results and Discussion

Spring Greenup

Plots were rated visually for spring greenup on 24 March, 1998, on a 1 to 9 scale, with 1 representing completely brown, dormant grass and 9 representing completely green grass. There were no significant differences between cultivars or fertility rates, but plots mowed at 0.75 in. were greener than those mowed at 1.5 in. (Table 1). It should be noted that spring greenup is not necessarily related to cold tolerance or winter survivability.

Turf Quality

The plots were visually rated for turf quality 7 times during the 1998 growing season on a 1 to 9 scale, where 1 represented loss of stand and 9 represented perfect turf quality. Generally, a rating of 5 or above is considered acceptable for a home or commercial lawn, and a rating of 6 is the minimum for a golf course fairway or a high quality sports field.

At the 0.75 inch mowing height, there were no statistical differences in turf quality between cultivars on 3 June, 29 October, or 4 December (Table 2). On the 4 other rating dates, Meyer was rated in the lowest statistical group, and the other cultivars were in the highest statistical group. The same relationship held true for the overall seasonal average for turf quality.

At the 1.5 inch mowing height, there were quality differences between cultivars on every rating date except 3 June. Meyer was in the lowest statistical group on each date and overall. Cavalier and Emerald, the two finest textured grasses in the study, both fell out of the top statistical group on 29 October and 4 December, but were in the top group for the overall seasonal average. Both Cavalier and Emerald, as well as Meyer, exhibited better quality at the lower mowing height than at the 1.5 in. height. Mowing height had no effect on quality among the other cultivars.

At the 0.75 in. mowing height, the highest (1.0 lbs N per 1000 sq. ft. per month) fertility level produced the highest quality turf on 5 of the 7 rating dates and overall (Table 3). At the 1.5 in. mowing height, the highest fertility level produced the highest quality turf on 6 rating dates and overall. The only exception to this relationship was Emerald, which produced turf of similar quality regardless of fertility level.

Fall Color

Because of a warm fall, fall color retention was rated on 7 January, 1999, on a 1 to 9 scale, with 1 representing brown and 9 representing completely green (Table 4). All other cultivars exhibited better fall color than Meyer, and Emerald was greener than El Toro.

The ability of a genotype to retain color into the fall or winter is not necessarily related to cold tolerance or winter survivability.

Literature Cited

Hall, M. H., R. H. White, J. E. Gaudreau, W. G. Menn, and G. R. Taylor. 1997. Zoysiagrass Cultivar Study. *In* Texas Turfgrass Research 1997. Texas Agric. Exp. Sta. Turf-97-33. <http://dallas.tamu.edu/pub/>.

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Table 1. Visually rated spring greenup of 6 Zoysiagrasses at 2 mowing heights and 3 fertility levels in College Station, Texas, in 1998.

<u>Mowing Ht.</u>	<u>Nitrogen Fertility Level</u>		
	<u>0.25</u> [*]	<u>0.50</u>	<u>1.0</u>
0.75 in.	4.8 [†] a [‡]	4.6 a	4.6 a
1.5 in.	4.1 b	4.1 b	4.1 b

* Fertility level expressed as lbs N per 1000 sq. ft. per growing month.

† Spring greenup rated from 1 to 9, where 1=brown and 9=completely green.

‡ Means followed by the same letter within columns are not different, according to Tukey's Studentized Range Test, at the 0.05 level.

Table 2. Comparison of visual quality ratings of 6 zoysiagrass genotypes at 2 mowing heights in College Station, Tx, in 1998.

<u>0.75 in. hoc</u> *	Rating Date							<u>Overall</u>
	<u>6/3</u>	<u>7/1</u>	<u>7/30</u>	<u>8/24</u>	<u>9/24</u>	<u>10/29</u>	<u>12/4</u>	
El Toro [†]	5.0 [‡]	5.3	5.5	5.4	6.6	5.5	4.8	5.4
Palisades	4.5	5.3	5.5	5.6	6.2	5.8	4.7	5.4
Crowne	4.9	5.3	5.0	4.9	6.0	5.3	4.6	5.1
Meyer	4.6	4.6	4.8	4.3	5.0	4.8	4.3	4.6
Cavalier	4.8	6.0	6.1	5.9	6.7	5.7	5.1	5.7
Emerald	5.5	5.7	6.3	5.4	6.0	5.5	4.8	5.6
MSD _{Q0.05} [¶]	ns [§]	1.3	1.3	1.2	1.5	ns	ns	1.0

<u>1.5 in. hoc</u>								
El Toro ^{4.4}	5.4	5.5	5.8	6.5	5.7	5.3	5.5	
Palisades	4.3	5.3	5.3	5.3	5.6	5.5	4.9	5.1
Crowne	4.7	4.8	5.1	5.3	5.7	5.3	4.8	5.1
Meyer	3.4	3.7	4.2	4.1	4.4	4.3	3.9	4.0
Cavalier	4.3	5.5	5.0	5.3	5.8	5.0	4.8	5.1
Emerald	4.7	5.3	5.7	5.3	5.4	4.6	4.0	5.0
MSD _{Q0.05}	ns	1.1	1.3	1.6	1.1	0.5	0.5	0.7

* Mowing height (bench setting).

[†] Genotypes grouped by leaf texture: first group - coarser textured, second group – finer textured.

[‡] Visual quality ratings, rated on a 1 to 9 scale, where 1=loss of stand and 9=perfect quality.

[¶] MSD_{Q0.05}, Minimum significant difference for comparison of visual quality rating means within columns and mowing heights, according to Tukey's Studentized Range Test at $\alpha=0.05$.

[§] ns, No significant difference between means at $p=0.05$.

Table 3. Visual quality ratings of zoysiagrass plots at 3 fertility levels in College Station, Tx, in 1998.

	Rating Date							<u>Overall</u>
	<u>6/3</u>	<u>7/1</u>	<u>7/30</u>	<u>8/24</u>	<u>9/24</u>	<u>10/29</u>	<u>12/4</u>	
0.75" HOC*								
N. Level								
1.0 [†]	5.0 [‡]	5.6	5.9	5.7	6.6	5.7	5.0	5.6
0.5	4.7	5.3	5.4	5.2	6.1	5.6	4.8	5.3
0.25	4.9	5.2	5.3	4.9	5.5	4.9	4.3	5.0
MSD _{Q0.05} [¶]	ns [§]	0.4	0.3	0.2	0.4	ns	0.7	0.3
1.5" HOC								
N. Level								
1.0	4.4	5.3	5.4	5.7	6.0	5.4	4.9	5.3
0.5	4.4	5.1	5.1	5.1	5.6	5.2	4.7	5.0
0.25	4.1	4.7	4.8	4.6	5.0	4.7	4.3	4.6
MSD _{Q0.05}	ns	0.4	0.6	0.4	1.0	0.6	0.5	0.5

* HOC, mowing height (bench setting).

[†] Nitrogen fertility level, expressed in lbs. N/1000 sq. ft. per growing month.

[‡] Visual quality ratings on a 1 to 9 scale, where 1=loss of stand and 9=perfect turf.

[¶]MSD_{Q0.05}, Minimum significant difference for comparison of visual quality rating means within columns and mowing heights, according to Tukey's Studentized Range Test at $\alpha=0.05$.

[§] ns, No significant difference between means at $p=0.05$.

Table 4. Visually rated fall color retention of 6 zoysiagrass cultivars in 1998 in College Station, Texas.

<u>Cultivar</u>	<u>Fall Color Retention</u>
Emerald	4.5*
Cavalier	4.0
Crowne	3.3
Palisades	3.0
El Toro	2.8
Meyer	1.0
MSD _{C0.05} [†]	1.6

* Fall color retention ratings based on a 1 to 9 scale, where 1=brown and 9=completely green.

[†] MSD_{C0.05}, Minimum significant difference, according to Tukey's Studentized Range Test at the 0.05 level.