

2002 NTEP Zoysiagrass Trial – Summary

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Photo by Aaron Patton

Zoysiagrass cultivar trial at Fayetteville, Ark.

Summary. Zoysiagrass continues to increase in popularity in transition-zone environments, due to its excellent turfgrass quality, persistence under adverse conditions, and low maintenance requirements. The National Turfgrass Evaluation Program is the predominant means by which cultivars are tested throughout North America. A zoysiagrass cultivar trial was planted in the summer of 2002 at Fayetteville, Arkansas. This trial has been maintained under golf course fairway conditions and data on spring green-up, overall turf quality, leaf color, leaf texture, seedheads, and

frost damage were collected from 2003 to 2006. Zorro, Emerald, and Cavalier were among the commercially available cultivars with the best turf quality across four years. Results from this study are intended to help residents of Arkansas make informed decisions when selecting turfgrass varieties. Planting well-adapted cultivars will improve turfgrass quality, reduce reestablishment costs from winterkill or drought, and ultimately increase sustainability.

Abbreviations: NTEP, National Turfgrass Evaluation Program

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Zoysiagrass (*Zoysia* spp.) has become an increasingly popular turfgrass for golf courses and home lawns in the transition zone due to its excellent turfgrass quality, persistence under adverse conditions, and low maintenance requirements. Currently, approximately 13% of lawns in Arkansas are zoysiagrass (Slaton, 2006). The popularity of the species is due to its enhanced cold tolerance, slow growth rate, and competitiveness against weeds. Until recently, most of the zoysiagrass used in the United States and Arkansas has been the cultivar Meyer. However, in the past twenty years, new germplasm has been collected and released and is starting to be used more frequently in the turfgrass industry. An integral part of the turfgrass research program at the University of Arkansas is the testing of new and improved cultivars of turfgrass for adaptation to this geographic region. The following report summarizes four years of data from the 2002 zoysiagrass cultivar evaluation trial sponsored by the National Turfgrass Evaluation Program.

Materials and Methods

This experiment was planted on 2 July 2002 at the University of Arkansas Research and Extension Center in Fayetteville on a Captina silt-loam soil. The plot size was 8 by 8 ft. and there were three replications of each cultivar. The vegetative cultivars were planted as 2-inch diameter plugs on 12-inch centers within the plots, while the seeded cultivars were broadcast planted at a seeding rate of 1.0 lb / 1000ft². Plots were maintained under golf course fairway or sports field conditions, with a mowing height of 0.5 inch and monthly applications of 0.5 lb N / 1000ft² during the growing season. Irrigation was applied as needed to promote germination and establishment and to prevent stress.

Cultivars were visually evaluated for spring green-up using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand. Overall turf quality was evaluated monthly from May through October in each year of the trial (2003-2006). Quality was visually assessed on a 1 to 9 scale,

with 9 representing ideal dark green, uniform, fine-textured turf and 1 representing dead turf. Turf genetic color was visually evaluated on a scale of 1 to 9, with 9 representing ideal, dark green turf and 1 representing tan or brown turf. Leaf texture was visually evaluated on a scale of 1 to 9, with 9 representing extremely fine turf texture and 1 representing extremely coarse texture. Cultivars were visually assessed for frost damage each fall using a 1 to 9 scale, with 9 representing no frost damage and 1 representing complete leaf kill. Seedheads were rated using a 1 to 9 scale, with 9 representing maximum presence of seedheads and 1 representing no seedheads present.

An analysis of variance was computed for each evaluation and cultivar means were separated using Fisher's protected least significant difference test ($\alpha = 0.05$).

Results and Discussion

There were significant differences in turf quality among cultivars in each year and across the entire 4-yr study (Table 1). Zorro was the only cultivar to be among the highest statistical rating group in each year of the trial. Zorro, Emerald, Cavalier, DALZ0104, and DALZ0101 had the best turf quality when averaged across four years with rating values of 7.2, 6.9, 6.9, 6.7, and 6.7, respectively. Chinese Common and PZA 32 were consistently rated lowest for turf quality with average values of 3.9 and 4.0, respectively.

Based on the four-year trial average, Zorro, Emerald, Cavalier, DALZ0104, and DALZ0101 have superior turf quality compared to the industry standard of Meyer, whereas Meyer had superior quality compared to Zenith, PZB 33, J-37, Compadre, PZB 32, and Chinese Common. The cultivars Himeno, PST-R7ZM, GN-Z, DALZ9604, DALZ0105, El Toro, Palisades, DALZ0102, BMZ230, Crowne, 6186, and PST-R7MA had four-year trial averages of turf quality similar to Meyer.

There were significant differences in spring green-up among cultivars (Table 2). BMZ230 and Meyer had the earliest spring green turf cover with average ratings of 6.2 and 5.7, respectfully. DALZ0104, DALZ9604, and 6186 had the least

green-up with average ratings of 2.1, 2.0, and 1.4, respectively.

There were significant leaf texture differences among cultivars (Table 2). DALZ0101, DALZ0104, Zorro, Cavalier, and Emerald had the finest leaf texture, averaging rating values ranging between 8.0 and 8.6. BMZ230, J-37, Crowne, DALZ0102, Palisades, Chinese Common, Compadre, El Toro, PZB33, and PZB32 had the coarsest leaf texture ratings with average rating values ranging from 4.7 to 5.3.

There were significant genetic color differences among cultivars (Table 2). DALZ0104, DALZ0101, 6186, Emerald, Zorro, Cavalier, DALZ0105, and Meyer were rated darkest green, with average rating values between 6.8 and 7.5. All cultivars had acceptable turf color (>5.0) except the lowest valued (4.3) cultivar Chinese Common.

There were significant differences among cultivars in frost damage (Table 2). Emerald, Zorro, DALZ0101, Cavalier, DALZ0105, and DALZ9604 had the least frost damage with average rating values of 6.8, 6.8, 6.7, 6.5, 6.5, and 6.2, respectively. Chinese Common, J-37, Zenith, PST-R7MA, PZA 32, PZB 33, and PST-R7ZM had the most visible frost damage as all these cultivars averaged rating values below 4.4.

Few zoysiagrass cultivars produced a significant numbers of seedheads in this trial (Table 2). Seedheads were most prevalent on BMZ230, El Toro, Himeno, and Palisades. Meyer is considered to be a heavy seedhead producer in the spring, but compared to most zoysiagrass cultivars, it has similar seedhead production.

In the early 1990's, Meyer was the main zoysiagrass cultivar being grown in Arkansas. Although Meyer is still produced at 25 sod farms in Arkansas, there are now 8 new cultivars being grown in Arkansas, including Cavalier, Crowne, Diamond, El Toro, Empire, Himeno, Palisades, and Zorro (Patton et al., 2008). Results from this study are intended to help residents of Arkansas make informed decisions when selecting turfgrass varieties. Planting well-adapted cultivars will improve turfgrass quality, reduce reestablishment costs from winterkill or drought, and ultimately increase sustainability.

Literature Cited

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Table 1. Annual turfgrass quality ratings for 24 zoysiagrass cultivars at Fayetteville, Ark. Data are also averaged across all 4 seasons (2003-2006) of the trial and ranked according to the 4-yr average.

Entry	2003	2004	2005	2006	Average
	----- turfgrass quality ^z -----				
Zorro ^{xw}	8.2	6.8	7.0	6.6	7.2 ^x
Emerald ^x	7.6	6.8	6.9	6.3	6.9
Cavalier ^x	7.1	6.9	6.7	6.8	6.9
DALZ 0104	7.6	6.9	5.7	6.5	6.7
DALZ 0101	8.1	6.3	6.6	5.8	6.7
Himeno ^x	5.8	6.1	6.2	5.9	6.0
PST-R7ZM ^y	6.6	5.9	5.8	5.6	6.0
GN-Z	6.7	5.9	6.3	5.0	6.0
DALZ 9604	6.9	6.2	4.6	5.8	5.9
DALZ 0105	7.3	6.1	4.9	5.1	5.9
El Toro ^x	6.0	6.3	5.4	5.8	5.9
Palisades ^x	5.1	5.9	6.2	5.8	5.8
DALZ 0102	6.2	5.5	5.6	5.7	5.7
Meyer ^x	5.6	6.0	5.9	5.1	5.6
BMZ 230	5.8	5.9	5.2	5.4	5.6
Crowne ^x	5.6	6.1	5.4	5.6	5.6
6186	6.6	5.9	3.7	5.2	5.3
PST-R7MA ^y	6.5	5.2	4.2	4.9	5.2
Zenith ^{y,x}	5.9	4.7	4.5	4.6	4.9
PZB 33 ^y	5.7	5.0	4.4	4.3	4.9
J-37 ^y	5.1	4.3	4.6	4.7	4.7
Compadre (Companion) ^{y,x}	5.2	4.8	4.5	4.5	4.7
PZA 32 ^y	5.6	4.2	3.1	3.2	4.0
Chinese Common ^y	4.6	3.7	3.7	3.7	3.9
LSD (P=0.05)	0.6	0.6	0.8	1.0	0.5

^z Turfgrass quality was visually rated on a scale of 1-9, with 9 = ideal turfgrass quality

^y Seeded zoysiagrass entries.

^x Commercially available in Arkansas by seed or sod.

^w Cultivars are sorted in descending order according to their 4 yr average.

Table 2. Spring greenup, leaf texture, genetic color, frost damage, and seedhead ratings for 24 zoysiagrass cultivars at Fayetteville, Ark. All data represent the average of multiple ratings over four seasons (2003-2006).

Entry	Spring greenup ^z	Leaf texture ^y	Genetic color ^x	Frost damage ^w	Seedheads ^v
----- Visually rated on a 1-9 scale -----					
6186 ^t	1.4	6.0	7.2	4.5	1.0
BMZ 230	6.2	4.7	6.1	5.3	3.0
Cavalier ^s	5.0	8.4	6.8	6.5	1.0
Chinese Common	3.7	4.9	4.3	3.3	2.2
Compadre (Companion) ^{u s}	5.3	5.0	5.8	4.8	1.7
Crowne ^s	4.3	4.8	6.5	5.3	2.3
DALZ 0104	2.1	8.5	7.5	5.7	1.0
DALZ 0101	4.7	8.6	7.3	6.7	1.0
DALZ 0102	4.6	4.8	5.7	4.8	1.2
DALZ 0105	2.3	7.8	6.8	6.5	1.0
DALZ 9604	2.0	6.5	6.2	6.2	1.0
El Toro ^s	4.4	5.0	6.5	5.2	3.2
Emerald ^s	5.0	8.0	7.2	6.8	1.0
GN-Z	4.4	6.8	5.8	4.8	1.2
Himeno ^s	2.6	5.6	6.3	4.7	3.5
J-37 ^u	4.6	4.7	5.2	4.0	1.7
Meyer ^s	5.7	6.6	6.8	5.0	1.5
Palisades ^s	4.6	4.8	6.6	4.7	2.8
PST-R7MA ^u	4.9	6.1	5.6	4.2	1.7
PST-R7ZM ^u	5.2	6.0	6.4	4.3	2.0
PZA 32 ^u	4.1	5.3	5.2	4.2	1.2
PZB 33 ^u	4.7	5.1	5.9	4.2	1.3
Zenith ^{u s}	4.7	5.6	5.8	4.0	2.2
Zorro ^s	4.1	8.5	7.0	6.8	1.2
LSD (P=0.05)	0.7	0.6	0.8	1.0	1.0

^z Spring greenup was rated on a scale of 1-9, with 9 = fully green

^y Leaf texture was rated on a scale of 1-9, with 9 = finest texture

^x Genetic color was rated on a scale of 1-9, with 9 = darkest green

^w Frost damage was rated on a scale of 1-9, with 9 = fully green turf, with no damage from frost

^v Seedheads were rated on a scale of 1-9, with 9 = maximum presence of seedheads and 1 = no seedheads present

^u Seeded zoysiagrass entries.

^t Cultivars are sorted alphabetically.

^s Commercially available in Arkansas by seed or sod.