

2007 Arkansas Zoysiagrass Trial – Year 3 Results

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Photo by Aaron Patton

Spring green-up is just one factor that varies by zoysiagrass cultivar.

Summary. Zoysiagrass has become an increasingly popular turfgrass for golf courses and home lawns in Arkansas due to its excellent turfgrass quality, persistence under adverse conditions, and low maintenance requirements. A zoysiagrass cultivar trial was planted in the summer of 2007 at Fayetteville, Ark. and was maintained under typical golf course fairway conditions. Data on spring green-up, winterkill, mowing quality, texture, color, and overall quality were collected in 2009. When analyzed across dates, Himeno, Meyer, and Victoria

had the highest turf quality and Compadre and Zenith had the lowest turf quality among *Zoysia japonica* cultivars and PristineFlora and Diamond had the highest turf quality among *Zoysia matrella* cultivars. Results from this study are intended to help residents of Arkansas make informed decisions when selecting turfgrass cultivars. Planting well-adapted cultivars will improve turfgrass quality, and reduce reestablishment costs from winterkill or drought and ultimately increase sustainability.

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Zoysiagrass (*Zoysia japonica* and *Zoysia matrella*) 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 (Patton, 2009). 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 (sometimes referred to as Meyers or Z-52) which was first introduced in the 1950s. 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. Arkansas was not chosen as an official location for the 2007 Zoysiagrass Trial with the National Turfgrass Evaluation Program; so researchers at the University of Arkansas obtained plant material of cultivars commonly used in Arkansas, other commercially available cultivars, and some experimental cultivars from Texas A&M University to evaluate the adaptability of these cultivars in Arkansas. The following report summarizes 2009 data from our 2007 Arkansas zoysiagrass cultivar evaluation trial at Fayetteville, Ark.

Materials and Methods

The entries were planted on 7 August 2007 at the University of Arkansas Research and Extension Center in Fayetteville. Plot size was 5 by 5 ft and there were three replications of each cultivar. Vegetative cultivars were planted as 2-inch diameter plugs on 12-inch spacings within the plots, while seeded cultivars were broadcast planted at a seeding rate of 1.0 lb/1000ft². Plots were maintained under golf course fairway 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 prevent moderate drought stress.

Overall turf quality was evaluated monthly beginning May 2009. 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. 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. Winterkill was monitored in the spring with visual estimates of the percent of the plots that did not green-up after winter. Density was rated on a scale of 1 to 9, with 9 representing maximum density. 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. Mowing quality was rated using a 1 to 9 scale, with 9 representing optimum mowing quality and a clean cut of the leaf blades and 1 representing a poor mowing quality with a substantial level of shredded leaf blades. When differences were analyzed between or by species, Emerald (*Z. japonica* x *Z. pacifica*) was grouped with *Z. matrella* because it is similar in color, texture, and density with *Z. matrella*.

Results and Discussion

The majority of zoysiagrass cultivar evaluation trials, including the National Turfgrass Evaluation Program, include both *Zoysia matrella* (Manilagrass or zoysiagrass) and *Zoysia japonica* (Japanese lawngrass or zoysiagrass) cultivars. *Zoysia matrella* has a distinct visual appearance mainly due to the narrower leaf blades compared to *Z. japonica*. As a result it is often difficult to compare the visual turf quality when rating among species since their appearance and their texture can skew the data towards *Z. matrella* cultivars having higher turf quality ratings. Additionally, turf managers who are searching cultivar evaluation trial data for a new cultivar to plant at their location typically are interested in either a finer (leaf) bladed cultivar or a coarse (leaf) bladed cultivar. Therefore, these results are analyzed across species and within species to allow useful

comparisons for those wanting information about various zoysiagrass cultivars.

Across Species. Spring green-up was highest for Diamond, Emerald, Meyer, Royal, UltimateFlora and Zorro on both collection dates (30 March and 30 April) in 2009 (Table 1). Spring green-up was similar among species on these dates in April 2009. Spring green-up was lowest for Shadowturf on both dates and for Shadowturf and DALZ 0701 in 2009 and both of these cultivars had >31% winterkill when evaluated in May 2009 although both recovered by July 2009 (data not shown). Air temperatures were as low as 8 °F during the winter (Richardson and Stiegler, 2010). This trial was planted in Fayetteville, Ark. to help better determine if there were differences in winter hardiness among cultivars. Although there was little winterkill in 2009, some cultivars are not thought to be well-adapted to Northwest Arkansas based on previous research in Fayetteville (M.D. Richardson, data unpublished).

Turf color was highest (darkest green) among Himeno and Meyer, and least (yellow-green) among Cavalier, DALZ0102, Palisades, UltimateFlora, Victoria, and Zorro on one rating date in July 2009 (Table 1). There was no difference between leaf color of species although *Z. matrella* did have narrower leaves than *Z. japonica*. Leaf texture was highest (fine or narrow leaf blades) for DALZ 0501, DALZ 0701, and Diamond and lowest (coarse or wide leaf blades) for Crowne, DALZ 0102, El Toro, Himeno, and Palisades on one rating date in July 2009 (Table 1). In September, between routine adjustments of the mower (reel/bedknife) a visual rating was collected for mowing quality. Mowing quality was highest (cleanly cut leaf blades) for Compadre, Diamond, Himeno, Meyer, PristineFlora, and Zenith and lowest (shredded leaf blades) among Cavalier, DALZ 0702, and Zorro (Table 1). Mowing quality was significantly better for *Z. japonica* than *Z. matrella*.

Turf quality varied across the collection dates (May, June, July, August, September) (Table 2). Cavalier, DALZ 0102, Diamond, PristineFlora, and Royal had the highest turf quality in May. Throughout the trial, DALZ 0701 had the low-

est turf quality from what appeared to be damage from take-all root rot (*Gaeumannomyces graminis* var. *graminis*). However, this disease did not appear to be present at significant levels in any of the other cultivars. Cavalier, DALZ 0501, DALZ 0702, Diamond, Emerald, PristineFlora, Royal, and Victoria had the highest turf quality in June. Meyer zoysiagrass was the only cultivar suffering mild drought stress during the June rating, which contributed to a decreased June turf quality rating, although Meyer was among the top group in July, August, and September. July turf quality was highest for DALZ 0501, Diamond, Meyer, PristineFlora, and Shadowturf. August turf quality was highest for Diamond, Himeno, Meyer, PristineFlora, Shadowturf, and Victoria. These same cultivars, with the exception of Shadowturf and Victoria, had the highest turf quality in September. When analyzed across dates, Diamond and PristineFlora had the highest turf quality.

Zoysia japonica. Spring green-up was highest for Compadre, El Toro, Meyer, UltimateFlora and Victoria and lowest for Himeno on 30 March 2009 (Table 3). Spring green-up was similar among all cultivars on 30 April 2009 and there was no difference in the winterkill among *Z. japonica* cultivars in 2009. *Zoysia japonica* cultivars are more winter hardy than *Z. matrella* (Patton and Reicher, 2007) and all *Z. japonica* cultivars should be adapted to Northwest Arkansas. However, there has not been significant winter damage in Arkansas since 2001 as a significant winterkill event typically occurs only once every ten years and there are known differences among the winter hardiness of *Z. japonica* cultivars (Patton and Reicher, 2007).

Turf color was highest (darkest green) among Himeno and Meyer, and least (yellow-green) among DALZ0102, El Toro, Palisades, UltimateFlora, and Victoria on one rating date in July 2009 (Table 3). Leaf texture was highest (fine or narrow leaf blades) for Meyer, Victoria, and UltimateFlora and lowest (coarse or wide leaf blades) Crowne, DALZ 0102, El Toro, Himeno, and Palisades on one rating date in July 2009 (Table 3). Mowing quality was highest (cleanly cut leaf blades) for Compadre, El Toro, Himeno, Meyer, Palisades,

and Zenith and lowest (shredded leaf blades) among Crowne, DALZ 0102, UltimateFlora, and Victoria (Table 3).

Turf quality varied across the collection dates (May, June, July, August, September). Himeno, Meyer, UltimateFlora, and Victoria had the highest turf quality in May, whereas Compadre, Crowne, and Zenith had the lowest turf quality (Table 4). Victoria had the highest turf quality in June with Compadre and Zenith having the lowest turf quality. July turf quality was highest for Himeno, Meyer, and Victoria with all other cultivars in the lowest statistical group. August turf quality was highest for Crowne, Himeno, Meyer, Palisades, UltimateFlora, and Victoria. Meyer and Himeno had the highest turf quality in September. When analyzed across dates, Himeno, Meyer, and Victoria had the highest turf quality and Compadre and Zenith had the lowest turf quality. Compadre and Zenith are the only two cultivars in this trial that can be established by seed. These cultivars are more commonly used in lawns in Arkansas at mowing heights higher than 0.5 inches or in the northern transitional climatic zone (between warm-humid and cool-humid climates) or areas north of the transition zone because of their excellent winter hardiness (Patton and Reicher, 2007).

Zoysia matrella. Spring green-up was highest for Diamond, Emerald, Royal, and Zorro on both collection dates (30 March and 30 April) in 2009 (Table 5). Shadowturf and DALZ 0701 had >31% winterkill measured on May 2009 although both recovered by July 2009 (data not shown). Air temperatures were as low as 8 °F during the winter (Richardson and Stiegler, 2010). *Zoysia japonica* cultivars are more winter hardy than *Z. matrella*, and there are known differences among the winter hardiness of *Z. matrella* cultivars (Patton and Reicher, 2007). Observations in Fayetteville, Ark. in previous years and previous research (Patton and Reicher, 2007) would suggest that winter injury might be expected for other *Z. matrella* cultivars as well such as Diamond. Future evaluations may help determine which *Z. matrella* cultivars are best suited for Arkansas.

There were no differences in turf color among *Z. matrella* cultivars (Table 5). Leaf tex-

ture was highest (fine or narrow leaf blades) for Diamond and lowest (wider leaf blades) for Cavalier, Emerald, Royal, Shadowturf, and Zorro on one rating date in July 2009 (Table 5). Mowing quality was highest (cleanly cut leaf blades) for Diamond and PristineFlora and lowest (shredded leaf blades) among Cavalier, DALZ 0702, Royal, and Zorro (Table 5). Mowing quality was likely high for Diamond and PristineFlora because these cultivars have a slower growth rate.

Turf quality varied across the collection dates (May, June, July, August, September). Cavalier, DALZ 0702, Diamond, PristineFlora, and Royal had the highest turf quality in May (Table 6). Throughout the trial, DALZ 0701 had the lowest turf quality from what appeared to be damage from take-all root rot. However, this disease did not appear to be present at significant levels in any of the other *Z. matrella* cultivars. Cavalier, DALZ 0501, DALZ 0702, Diamond, Emerald, PristineFlora, and Royal had the highest turf quality in June. July and August turf quality was highest for Diamond, PristineFlora, and Shadowturf. Diamond and PristineFlora had the highest turf quality in September. When analyzed across dates, Diamond and PristineFlora had the highest turf quality.

Summary

In the early 1990s, Meyer was the main zoysiagrass cultivar being grown in Arkansas. Although Meyer is still produced at 25 sod farms in Arkansas (Patton et al., 2008), there are now ten other cultivars being grown in Arkansas, including Cavalier, Crowne, Diamond, Empire, El Toro, Empire, Himeno, Matrella (FC13521), Palisades, and Zorro. Some of these cultivars have improved characteristics or turf quality over Meyer zoysiagrass, but Meyer remains among the top performing *Z. japonica* cultivars in Arkansas and the transition zone. Results from this study are intended to help residents of Arkansas make informed decisions when selecting turfgrass cultivars. Planting well-adapted cultivars will improve turfgrass quality, and reduce reestablishment costs from winterkill or drought and ultimately increase sustainability.

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Table 1. Spring green-up, winterkill, color, leaf texture, and mowing quality ratings in 2009 for various zoysiagrass cultivars in Fayetteville, Ark.

Cultivar	Species	Spring green-up ^z		Winterkill ^y	Color ^x	Texture ^w	Mowing quality ^v
		March 30	April 30				
		-----1-9 scale-----		----%----	-----visually rated on a 1-9 scale-----		
Cavalier	<i>Z. matrella</i>	4.0	9.0	0.0	6.0	7.0	4.0
Compadre	<i>Z. japonica</i>	4.7	8.0	0.0	7.0	5.0	7.0
Crowne	<i>Z. japonica</i>	3.7	7.3	5.0	6.7	4.3	6.0
DALZ 0102	<i>Z. japonica</i>	4.0	8.3	0.0	5.3	3.7	6.0
DALZ 0501	<i>Z. matrella</i>	3.3	7.7	5.0	6.7	8.3	5.0
DALZ 0701	<i>Z. matrella</i>	3.0	5.7	31.7	6.3	8.3	5.3
DALZ 0702	<i>Z. matrella</i>	3.3	8.0	5.0	6.3	7.7	4.3
Diamond	<i>Z. matrella</i>	4.7	8.3	0.0	7.0	9.0	7.0
El Toro	<i>Z. japonica</i>	5.0	8.0	0.0	6.3	4.0	6.3
Emerald ^u	<i>Z. matrella</i>	4.7	8.3	1.7	6.3	7.0	6.0
Himeno	<i>Z. japonica</i>	2.0	8.0	3.3	8.0	4.3	6.7
Meyer (Z-52)	<i>Z. japonica</i>	4.7	8.7	0.0	7.7	5.7	7.0
Palisades	<i>Z. japonica</i>	4.3	8.3	0.0	6.0	4.0	6.3
PristineFlora	<i>Z. matrella</i>	3.7	7.7	5.0	6.7	8.0	7.3
Royal	<i>Z. matrella</i>	5.0	9.0	0.0	6.3	7.0	4.7
Shadowturf	<i>Z. matrella</i>	1.7	5.0	33.3	7.0	7.3	6.0
UltimateFlora	<i>Z. japonica</i>	5.3	9.0	0.0	5.7	6.0	5.7
Victoria	<i>Z. japonica</i>	5.0	7.7	0.0	5.7	6.0	5.3
Zenith	<i>Z. japonica</i>	4.0	7.7	0.0	7.0	5.0	6.7
Zorro	<i>Z. matrella</i>	5.0	9.0	0.0	6.0	7.0	3.7
Average		4.1	7.9	4.5	6.5	6.2	5.8
LSD (P=0.05)		0.7	0.8	7.3	0.7	0.8	0.8
	<i>Z. japonica</i>	4.3	8.1	0.8	6.5	4.8	6.3
	<i>Z. matrella</i>	3.8	7.8	8.1	6.5	7.7	5.3
P – value		NS	NS	0.0055	NS	<0.0001	0.0007

^z Spring green-up was visually evaluated for zoysiagrass cultivars using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand.

^y Winterkill was visually evaluated as the percent of the plot that did not green-up in the spring.

^x 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.

^w 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.

^v Mowing quality was rated using a 1 to 9 scale, with 9 representing optimum mowing quality and a clean cut of the leaf blades and 1 representing a poor mowing quality with a substantial level of shredded leaf blades.

^u Formerly *Zoysia japonica* × *Zoysia tenuifolia*, now *Z. japonica* × *Z. pacifica*. Emerald was grouped with *Z. matrella* because it is similar in color, texture, and density with other *Z. matrella* cultivars.

Table 2. Turf quality ratings in 2009 for various zoysiagrass cultivars in Fayetteville, Ark.

Cultivar	Species	Turfgrass quality ^z					Average
		May	June	July	August	September	
		-----visually rated on a 1-9 scale-----					
Diamond	<i>Z. matrella</i>	7.3	7.7	8.0	8.0	8.0	7.8
PristineFlora	<i>Z. matrella</i>	7.0	7.7	8.3	8.0	8.0	7.8
DALZ 0501	<i>Z. matrella</i>	6.3	7.0	7.7	7.0	7.0	7.0
Himeno	<i>Z. japonica</i>	6.3	6.7	7.3	7.3	7.3	7.0
Cavalier	<i>Z. matrella</i>	7.0	7.0	7.0	7.0	6.3	6.9
Emerald ^y	<i>Z. matrella</i>	6.7	7.0	7.0	7.0	7.0	6.9
Victoria	<i>Z. japonica</i>	6.0	7.7	7.3	7.3	6.3	6.9
DALZ 0702	<i>Z. matrella</i>	7.0	7.0	7.3	6.7	6.0	6.8
Meyer (Z-52)	<i>Z. japonica</i>	5.7	5.3	7.7	7.3	7.7	6.7
Shadowturf	<i>Z. matrella</i>	4.0	6.3	8.0	8.0	7.0	6.7
Zorro	<i>Z. matrella</i>	6.7	6.7	7.0	7.0	5.7	6.6
Royal	<i>Z. matrella</i>	7.7	7.0	6.3	6.0	5.7	6.5
UltimateFlora	<i>Z. japonica</i>	5.7	6.0	6.7	6.7	6.3	6.3
DALZ 0102	<i>Z. japonica</i>	5.0	6.3	6.3	6.0	6.3	6.0
Palisades	<i>Z. japonica</i>	5.0	5.7	6.3	6.3	6.0	5.9
El Toro	<i>Z. japonica</i>	5.0	6.0	6.3	6.0	5.7	5.8
Crowne	<i>Z. japonica</i>	4.0	5.3	6.7	6.3	6.3	5.7
Compadre	<i>Z. japonica</i>	4.0	4.3	6.0	5.7	6.0	5.2
Zenith	<i>Z. japonica</i>	4.0	4.0	6.0	5.3	5.3	4.9
DALZ 0701	<i>Z. matrella</i>	3.0	3.3	4.0	3.7	3.3	3.5
Average		5.7	6.2	6.9	6.6	6.4	6.3
LSD (P=0.05)		0.8	0.7	0.8	0.8	0.9	0.4
	<i>Z. japonica</i>	5.1	5.7	6.7	6.4	6.3	6.0
	<i>Z. matrella</i>	6.3	6.7	7.1	6.8	6.4	6.6
P – value		0.0006	0.0038	NS	NS	NS	<0.0105

^z Turf quality rated on a scale of 1 to 9 (9= ideal dark green, uniform, dense, fine-textured turf, 1=dead).

^y Formerly *Zoysia japonica* × *Zoysia tenuifolia*, now *Z. japonica* × *Z. pacifica*. Emerald was grouped with *Z. matrella* because it is similar in color, texture, and density with other *Z. matrella* cultivars.

Table 3. Spring green-up, winterkill, color, leaf texture, and mowing quality ratings in 2009 for various *Zoysia japonica* cultivars in Fayetteville, Ark.

Cultivar	Species	Spring green-up ^z		Winterkill ^y	Color ^x	Texture ^w	Mowing quality ^v
		March 30	April 30				
		-----1-9 scale-----		----%----	-----visually rated on a 1-9 scale-----		
Compadre	<i>Z. japonica</i>	4.7	8.0	0.0	7.0	5.0	7.0
Crowne	<i>Z. japonica</i>	3.7	7.3	5.0	6.7	4.3	6.0
DALZ 0102	<i>Z. japonica</i>	4.0	8.3	0.0	5.3	3.7	6.0
El Toro	<i>Z. japonica</i>	5.0	8.0	0.0	6.3	4.0	6.3
Himeno	<i>Z. japonica</i>	2.0	8.0	3.3	8.0	4.3	6.7
Meyer (Z-52)	<i>Z. japonica</i>	4.7	8.7	0.0	7.7	5.7	7.0
Palisades	<i>Z. japonica</i>	4.3	8.3	0.0	6.0	4.0	6.3
UltimateFlora	<i>Z. japonica</i>	5.3	9.0	0.0	5.7	6.0	5.7
Victoria	<i>Z. japonica</i>	5.0	7.7	0.0	5.7	6.0	5.3
Zenith	<i>Z. japonica</i>	4.0	7.7	0.0	7.0	5.0	6.7
Average		4.3	8.1	0.8	6.5	4.8	6.3
LSD (P=0.05)		0.89	NS	NS	0.78	0.97	0.78

^z Spring green-up was visually evaluated for zoysiagrass cultivars using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand.

^y Winterkill was visually evaluated as the percent of the plot that did not green-up in the spring.

^x 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.

^w 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.

^v Mowing quality was rated using a 1 to 9 scale, with 9 representing optimum mowing quality and a clean cut of the leaf blades and 1 representing a poor mowing quality with a substantial level of shredded leaf blades.

Table 4. Turf quality ratings in 2009 for various *Zoysia japonica* cultivars in Fayetteville, Ark.

Cultivar	Species	Turfgrass quality ^z					Average
		May	June	July	August	September	
		-----visually rated on a 1-9 scale-----					
Himeno	<i>Z. japonica</i>	6.3	6.7	7.3	7.3	7.3	7.0
Victoria	<i>Z. japonica</i>	6.0	7.7	7.3	7.3	6.3	6.9
Meyer (Z-52)	<i>Z. japonica</i>	5.7	5.3	7.7	7.3	7.7	6.7
UltimateFlora	<i>Z. japonica</i>	5.7	6.0	6.7	6.7	6.3	6.3
DALZ 0102	<i>Z. japonica</i>	5.0	6.3	6.3	6.0	6.3	6.0
Palisades	<i>Z. japonica</i>	5.0	5.7	6.3	6.3	6.0	5.9
El Toro	<i>Z. japonica</i>	5.0	6.0	6.3	6.0	5.7	5.8
Crowne	<i>Z. japonica</i>	4.0	5.3	6.7	6.3	6.3	5.7
Compadre	<i>Z. japonica</i>	4.0	4.3	6.0	5.7	6.0	5.2
Zenith	<i>Z. japonica</i>	4.0	4.0	6.0	5.3	5.3	4.9
Average		5.1	5.7	6.7	6.4	6.3	6.0
LSD (P=0.05)		0.69	0.74	0.96	1.02	1.08	0.54

^z Turf quality rated on a scale of 1 to 9 (9= ideal dark green, uniform, dense, fine-textured turf, 1=dead).

Table 5. Spring green-up, winterkill, color, leaf texture, and mowing quality ratings in 2009 for various *Zoysia matrella* cultivars in Fayetteville, Ark.

Cultivar	Species	Spring green-up ^z		Winterkill ^y	Color ^x	Texture ^w	Mowing quality ^v
		March 30	April 30				
		-----1-9 scale-----		----%----	-----visually rated on a 1-9 scale-----		
Cavalier	<i>Z. matrella</i>	4.0	9.0	0.0	6.0	7.0	4.0
DALZ 0501	<i>Z. matrella</i>	3.3	7.7	5.0	6.7	8.3	5.0
DALZ 0701	<i>Z. matrella</i>	3.0	5.7	31.7	6.3	8.3	5.3
DALZ 0702	<i>Z. matrella</i>	3.3	8.0	5.0	6.3	7.7	4.3
Diamond	<i>Z. matrella</i>	4.7	8.3	0.0	7.0	9.0	7.0
Emerald ^u	<i>Z. matrella</i>	4.7	8.3	1.7	6.3	7.0	6.0
PristineFlora	<i>Z. matrella</i>	3.7	7.7	5.0	6.7	8.0	7.3
Royal	<i>Z. matrella</i>	5.0	9.0	0.0	6.3	7.0	4.7
Shadowturf	<i>Z. matrella</i>	1.7	5.0	33.3	7.0	7.3	6.0
Zorro	<i>Z. matrella</i>	5.0	9.0	0.0	6.0	7.0	3.7
Average		3.8	7.8	8.1	6.5	7.7	5.3
LSD (P=0.05)		0.59	0.83	9.0	NS	0.59	1.02

^z Spring green-up was visually evaluated for zoysiagrass cultivars using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand.

^y Winterkill was visually evaluated as the percent of the plot that did not green-up in the spring.

^x 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.

^w 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.

^v Mowing quality was rated using a 1 to 9 scale, with 9 representing optimum mowing quality and a clean cut of the leaf blades and 1 representing a poor mowing quality with a substantial level of shredded leaf blades.

^u Formerly *Zoysia japonica* × *Zoysia tenuifolia*, now *Z. japonica* × *Z. pacifica*. Emerald was grouped with *Z. matrella* because it is similar in color, texture, and density with other *Z. matrella* cultivars.

Table 6. Turf quality ratings in 2009 for various *Zoysia matrella* cultivars in Fayetteville, Ark.

Cultivar	Species	Turfgrass quality ^z					Average
		May	June	July	August	September	
		-----visually rated on a 1-9 scale-----					
Diamond	<i>Z. matrella</i>	7.3	7.7	8.0	8.0	8.0	7.8
PristineFlora	<i>Z. matrella</i>	7.0	7.7	8.3	8.0	8.0	7.8
DALZ 0501	<i>Z. matrella</i>	6.3	7.0	7.7	7.0	7.0	7.0
Cavalier	<i>Z. matrella</i>	7.0	7.0	7.0	7.0	6.3	6.9
Emerald ^y	<i>Z. matrella</i>	6.7	7.0	7.0	7.0	7.0	6.9
DALZ 0702	<i>Z. matrella</i>	7.0	7.0	7.3	6.7	6.0	6.8
Shadowturf	<i>Z. matrella</i>	4.0	6.3	8.0	8.0	7.0	6.7
Zorro	<i>Z. matrella</i>	6.7	6.7	7.0	7.0	5.7	6.6
Royal	<i>Z. matrella</i>	7.7	7.0	6.3	6.0	5.7	6.5
DALZ 0701	<i>Z. matrella</i>	3.0	3.3	4.0	3.7	3.3	3.5
Average		6.3	6.7	7.1	6.8	6.4	6.6
LSD (P=0.05)		0.96	0.73	0.62	0.70	0.81	0.36

^z Turf quality rated on a scale of 1 to 9 (9= ideal dark green, uniform, dense, fine-textured turf, 1=dead).

^y Formerly *Zoysia japonica* × *Zoysia tenuifolia*, now *Z. japonica* × *Z. pacifica*. Emerald was grouped with *Z. matrella* because it is similar in color, texture, and density with other *Z. matrella* cultivars.