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Comparing Zoysia Experimental Genotypes Developed by Kansas State University, Texas A&M, and Purdue to Meyer in the National Turfgrass Evaluation Program Test

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Abstract

The National Turfgrass Evaluation Program (NTEP) Zoysia Test was planted in 2019 at the Kansas State University Olathe Horticulture Center, Olathe, KS. Since planting, three experimental genotypes developed at Kansas State University (with cooperators noted below) have outperformed 'Meyer' in establishment rate, turf quality, drought tolerance, and fall color. Earlier research has demonstrated large patch tolerance in all three experimental genotypes.

Keywords

zoysia, new cultivar release, drought tolerance, large patch tolerance, turf quality

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TURFGRASS RESEARCH 2022



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Jack D. Fry and Dani McFadden

Summary

The National Turfgrass Evaluation Program (NTEP) Zoysia Test was planted in 2019 at the Kansas State University Olathe Horticulture Center, Olathe, KS. Since planting, three experimental genotypes developed at Kansas State University (with cooperators noted below) have outperformed 'Meyer' in establishment rate, turf quality, drought tolerance, and fall color. Earlier research has demonstrated large patch tolerance in all three experimental genotypes.

Rationale

Several new zoysiagrasses are under evaluation for adaptation across the US. In this experiment, we're particularly interested in looking at genotypes that were identified and developed through K-State; Texas A&M AgriLife Research, Dallas, TX; and Purdue University, West Lafayette, IN. The genotypes were 'DALZ 1701', 'DALZ 1707', and 'DALZ 1808'. In research conducted prior to the NTEP evaluation, these genotypes performed better than the standard, Meyer, and also showed tolerance to the disease large patch.

Objective

To evaluate performance of experimental zoysiagrasses in Kansas with a focus on new genotypes developed at K-State, which partnered with Texas A&M AgriLife Research-Dallas and Purdue University.

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Study Description

This experiment is conducted at the Olathe Horticulture Center in Olathe, KS. The three experimental zoysiagrasses have been under evaluation since 2012 in research that was sponsored by the United States Golf Association. All zoysiagrass plugs were planted on 1-ft centers on July 11, 2019. Oxadiazon was applied immediately after planting to suppress annual grassy weeds. In 2021, dithiopyr (Dimension) was applied in April. Approximately 1.5 lb N/1,000 ft² was applied in 2019 and 2020 in midsummer. Data were collected on spring green-up, coverage, leaf texture, turf quality, wilt, and fall color. Coverage was rated visually on a 0 to 100% scale. All other ratings were based upon visual ratings on a 1 to 9 scale, 9 = optimum performance.

Results

For discussion, we'll focus on the three K-State experimental genotypes that have shown excellent cold tolerance, quality, and large patch tolerance in transition zone locations (DALZ 1701, DALZ 1707, and DALZ 1808). These three genotypes will be compared with Meyer zoysiagrass, the standard cultivar used in the transition zone. Regarding spring green-up, DALZ 1701 and 1707 were statistically similar to Meyer; all three (including DALZ 1808) were similar in leaf texture (Table 1). All three experimentals were superior in wilt to Meyer; Meyer had the lowest rating for wilt among all entries after an extended period of drought with no irrigation. DALZ 1701 and 1707 were also superior to Meyer in fall color. Mean quality ratings of all three experimentals were superior to that of Meyer. It is quite promising that these experimentals developed through the efforts of Texas A&M AgriLife-Dallas, K-State, and Purdue have demonstrated excellent quality, cold tolerance, large patch tolerance, spring green-up, and fall color. On July 19, 2022 DALZ 1701 was identified as the genotype that will be moving forward as a new cultivar for use in the transition zone and other areas of the U.S.

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Table 1. Turf performance of zoysiagrasses in the 2019 National Turfgrass Evaluation Program trial; the three experimental zoysiagrass genotypes are highlighted below, and compared with Meyer zoysiagrass in the results

Entry	Spring green-up [†]	Texture	Wilting	Fall color	Seedhead	Quality
	May 6, 2021	June 8, 2021	July 28, 2021	Nov. 3, 2021	May 21, 2021	Average
DALZ 1808	6.0 [‡]	6.0	9.0	4.7	6.3	7.3
DALZ 1701	7.3	5.7	8.3	6.3	4.3	7.2
FZ 1422	6.0	6.0	8.3	5.7	5.7	7.2
DALZ 1707	6.7	6.0	8.7	5.7	2.3	7.1
EMERALD	7.0	7.7	8.3	5.7	7.7	7.1
FAES 1319	7.0	6.0	9.0	5.3	7.7	7.1
ZEON	7.0	7.3	8.3	6.0	7.7	7.0
DALZ 1311	6.0	3.3	9.0	5.0	4.3	6.9
DALZ 1601	6.7	5.3	9.0	5.0	5.7	6.9
DALZ 1603	6.3	4.3	9.0	5.3	4.7	6.9
FZ 1407	6.7	4.3	9.0	5.0	5.0	6.7
FZ 1410	6.7	4.0	9.0	5.0	6.3	6.7
DALZ 1613	5.0	7.3	8.3	6.0	8.7	6.6
EMPIRE	4.7	4.3	9.0	4.0	5.3	6.5
FZ 1327	6.3	4.0	8.3	5.3	2.7	6.4
15-TZ-11715	5.0	6.7	7.3	6.0	8.3	6.3
MEYER	8.0	5.0	4.7	3.0	3.7	6.2
DALZ 1614	5.0	6.7	7.3	5.7	7.7	6.1
FZ 1732	6.3	7.7	7.7	5.3	8.3	5.9
FZ 1727	6.3	7.3	7.7	6.0	8.3	5.8
FZ 1723	5.7	7.3	7.0	5.0	8.0	5.7
FAES 1335	5.7	6.0	8.0	6.0	9.0	5.2
16-TZ-13463	5.3	7.0	7.3	5.0	8.0	5.0
16-TZ-12783	6.3	6.0	7.7	6.3	8.7	4.8
FZ 1722	5.7	6.3	8.7	5.7	8.3	4.6
DALZ 1713	4.0	5.7	9.0	5.7	8.7	4.2
FZ 1728	1.0	7.7	6.3	4.7	9.0	3.9
FZ 1440	1.0	7.7	8.0	5.3	9.0	3.1
FZ 1436	1.0	6.3	8.3	5.0	9.0	2.7
FZ 1721	1.0	5.0	9.0	6.0	9.0	2.6
FZ 1367	1.0	7.3	8.3	5.0	8.7	2.5
UGA GZ 17-4	3.0	7.7	7.7	5.3	9.0	2.5

continued



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Table 1. Turf performance of zoysiagrasses in the 2019 National Turfgrass Evaluation Program trial; the three experimental zoysiagrass genotypes are highlighted below, and compared with Meyer zoysiagrass in the results

Entry	Spring green-up [†]	Texture	Wilting	Fall color	Seedhead	Quality
	May 6, 2021	June 8, 2021	July 28, 2021	Nov. 3, 2021	May 21, 2021	Average
DALZ 1409	4.7	8.0	9.0	5.7	8.7	2.3
DALZ 1408	1.0	7.7	8.7	5.3	9.0	2.2
DALZ 1714	1.0	5.3	9.0	5.0	9.0	2.1
DALZ 1806	3.7	7.7	7.0	5.0	7.3	2.1
DALZ 1807	1.0	5.5	8.0	1.0	9.0	1.7
DALZ 1802	1.0	6.0	8.0	1.0	9.0	1.6
FZ 1368 (didn't survive winter)	---	---	---	---	---	---
LSD	1.9	1.2	1.2	2.4	1.1	0.6

[†] All visual ratings were based on a scale of 1 to 9 (1 = poorest measure, 6 = acceptable, and 9 = optimum measure). Average quality was determined by monthly ratings from May-September.

[‡] To determine statistical differences among entries, subtract one entry's mean from another's. If the result is larger than the corresponding least significant difference (LSD) value, the two are statistically different. Highlighted rows show data for the three experimental genotypes which have been developed cooperatively by Kansas State University, Texas A&M AgriLife Research-Dallas, and Purdue University.

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