

2021

## Performance of Kansas State University's Cold and Large Patch-Tolerant Zoysiagrasses in the National Turfgrass Evaluation Program Test

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### Recommended Citation

Fry, Jack and Chhetri, Manoj (2021) "Performance of Kansas State University's Cold and Large Patch-Tolerant Zoysiagrasses in the National Turfgrass Evaluation Program Test," *Kansas Agricultural Experiment Station Research Reports*: Vol. 7: Iss. 4. <https://doi.org/10.4148/2378-5977.8064>

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# TURFGRASS RESEARCH 2021



JULY 2021

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## Performance of Kansas State University's Cold- and Large Patch-Tolerant Zoysiagrasses in the National Turfgrass Evaluation Program Test

*Jack Fry and Manoj Chhetri*

### 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 K-State (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: 'DALZ 1701', 'DALZ 1707', and 'DALZ 1808'. In research conducted prior to the NTEP evaluation, these genotypes performed better than the standard, Meyer, and 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, and applied again in April 2020. Approximately 1.5 lb N/1,000 ft<sup>2</sup> 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. In this experiment, spring green up of the three genotypes was statistically similar to Meyer (Table 1). Coverage of all three genotypes was higher than Meyer in May and June, indicating a faster establishment rate. Leaf texture was statistically similar to Meyer. Turf quality of all three experimental genotypes was superior to Meyer in August and September. In addition, Meyer experienced severe wilt in late August, whereas the three experimental genotypes had little or no wilt. Fall color in early November was higher in the experimental genotypes than in Meyer. Results in the first full year of this NTEP experiment demonstrated that these experimental genotypes developed for use in the transition zone are quite promising.

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**Table 1. Turf performance of zoysiagrasses in the 2019 NTEP trial; the three experimental zoysiagrass genotypes are highlighted below, and compared with Meyer zoysiagrass in the results section**

Entries	Spring green up		Coverage (%)			Texture		Turf quality		Wilt	Fall color
	7 April	19 May	19 May	17 June	10 Aug	17 June	10 Aug	27 Aug	29 Sept	27 Aug	5 Nov
Meyer	4.7	8.0	31.0	65.0	89.3	7.3	6.0	4.7	5.7	3.3	4.0
Emerald	4.3	8.0	53.0	76.7	91.7	9.0	8.0	8.3	7.3	8.0	6.3
Zeon	4.3	8.7	66.7	86.0	95.0	9.0	8.0	8.3	8.0	7.0	5.7
FZ 1410	4.7	7.3	53.3	75.0	100.0	4.3	4.0	5.7	5.3	9.0	5.0
FZ 1368	1.0	1.0	0.0	0.0	3.3	†	-	-	-	-	-
FZ 1367	1.0	2.0	0.3	24.0	63.3	9.0	8.3	4.0	3.7	6.0	4.3
FZ 1440	1.0	3.3	3.0	50.0	76.7	9.0	8.3	4.7	4.7	7.0	3.7
FZ 1422	4.7	7.3	53.3	73.3	100.0	8.3	7.0	7.7	7.7	8.7	5.0
FZ 1727	2.3	7.0	47.7	70.0	98.3	9.0	8.3	7.7	8.0	6.3	5.7
FZ 1436	1.0	2.7	3.7	36.7	71.7	9.0	8.3	4.0	3.7	6.3	4.7
15-TZ-11715	3.3	7.7	63.3	78.3	98.3	9.0	7.7	7.7	7.7	7.0	5.3
16-TZ-12783	2.3	6.7	40.0	70.0	95.0	7.3	5.7	6.3	7.0	7.7	5.3
16-TZ-13463	3.0	6.7	51.0	58.3	91.7	9.0	7.3	6.3	6.7	4.7	5.0
UGA GZ 17-4	1.0	2.3	3.0	16.7	60.0	9.0	9.0	3.3	2.3	5.7	7.0
Empire	4.7	7.7	81.7	96.0	100.0	5.3	4.0	5.3	6.0	9.0	4.7
DALZ 1713	1.3	3.0	3.7	36.7	73.3	7.7	6.7	4.3	3.7	8.3	4.3
DALZ 1714	1.3	3.0	2.3	20.0	48.3	7.7	7.3	3.3	3.0	7.3	7.0
DALZ 1802	1.0	1.0	0.0	1.0	5.7	-	-	-	-	-	-
DALZ 1806	1.0	2.3	1.3	11.0	30.0	9.0	8.7	2.7	2.7	-	7.3
DALZ 1807	1.0	1.0	0.0	0.0	0.0	-	-	-	-	-	-
<b>DALZ 1808*</b>	<b>5.0</b>	<b>7.7</b>	<b>63.3</b>	<b>85.0</b>	<b>100.0</b>	<b>7.7</b>	<b>6.7</b>	<b>7.3</b>	<b>7.3</b>	<b>8.3</b>	<b>5.3</b>
DALZ 1311	5.0	7.7	75.3	92.7	100.0	4.7	4.0	5.3	5.3	9.0	4.7

*continued*



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Entries	Spring green up		Coverage (%)			Texture		Turf quality		Wilt	Fall color
	7 April	19 May	19 May	17 June	10 Aug	17 June	10 Aug	27 Aug	29 Sept	27 Aug	5 Nov
DALZ 1408	1.0	2.0	1.7	16.7	56.7	9.0	8.3	3.3	3.0	5.7	5.3
DALZ 1409	1.0	2.0	1.7	10.0	40.0	9.0	8.7	3.0	2.3	6.3	7.0
DALZ 1601	4.7	8.0	76.7	92.7	100.0	4.7	4.0	5.3	5.3	9.0	5.3
DALZ 1603	5.0	8.0	75.0	90.0	100.0	4.7	4.0	5.3	5.3	9.0	5.7
DALZ 1613	3.7	6.0	36.0	63.3	83.3	8.0	7.7	8.0	5.0	8.0	4.3
DALZ 1614	4.0	7.3	56.7	68.3	96.7	8.0	7.7	8.0	7.0	7.0	6.3
<b>DALZ 1701</b>	<b>4.7</b>	<b>7.3</b>	<b>56.7</b>	<b>83.3</b>	<b>100.0</b>	<b>7.3</b>	<b>6.7</b>	<b>7.3</b>	<b>7.3</b>	<b>8.7</b>	<b>5.7</b>
<b>DALZ 1707</b>	<b>5.0</b>	<b>8.7</b>	<b>68.3</b>	<b>85.0</b>	<b>100.0</b>	<b>7.3</b>	<b>7.0</b>	<b>8.0</b>	<b>8.0</b>	<b>8.3</b>	<b>6.0</b>
FAES 1319	5.0	7.3	68.7	73.3	100.0	7.0	6.3	7.7	7.7	8.7	5.0
FAES 1335	2.0	5.3	28.3	60.0	86.7	8.3	7.7	5.3	5.0	7.7	5.7
FZ 1327	5.0	8.0	70.0	90.0	96.7	5.0	4.0	6.0	5.7	8.7	5.3
FZ 1407	4.7	8.0	65.0	91.0	100.0	5.0	4.0	5.0	5.3	9.0	4.7
FZ 1721	1.0	1.0	0.0	0.3	4.0	-	-	-	-	-	-
FZ 1722	3.0	6.7	21.7	60.0	90.0	9.0	8.0	5.0	5.0	7.0	6.0
FZ 1723	4.3	7.0	38.7	68.3	95.0	9.0	8.0	5.3	5.7	6.0	5.0
FZ 1728	1.0	4.3	6.7	46.7	76.7	9.0	9.0	4.3	4.3	3.7	5.3
FZ 1732	3.0	6.3	48.3	65.0	93.3	8.7	7.7	8.0	7.3	7.0	6.0
LSD <sup>‡</sup> <sub>0.05</sub>	0.6	1.0	15.4	11.3	12.9	0.7	0.7	1.0	1.3	1.4	0.9

<sup>†</sup> Visual ratings were based on a scale of 1 to 9 (1 = poorest measure, 6 = acceptable, and 9 = optimum measure).

<sup>‡</sup> 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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