[Kansas Agricultural Experiment Station Research Reports](https://newprairiepress.org/kaesrr)

Volume 1
Issue 6 *Turfgrass Research*

Article 2

January 2015

Evaluation of New Zoysiagrass Experimental Lines for Winter Hardiness and Turf Quality in the Transition Zone

R. Braun
Kansas State University, rcbraun@purdue.edu

J. Fry
Kansas State University, jfry@ksu.edu

M. Kennelly
Kansas State University, kennelly@ksu.edu

Follow this and additional works at: https://newprairiepress.org/kaesrr

Part of the Horticulture Commons

Recommended Citation

Braun, R.; Fry, J.; and Kennelly, M. (2015) "Evaluation of New Zoysiagrass Experimental Lines for Winter Hardiness and Turf Quality in the Transition Zone," *Kansas Agricultural Experiment Station Research Reports*: Vol. 1: Iss. 6. https://doi.org/10.4148/2378-5977.1090

This report is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Kansas Agricultural Experiment Station Research Reports by an authorized administrator of New Prairie Press. Copyright 2015 the Author(s). Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. K-State Research and Extension is an equal opportunity provider and employer.

Turfgrass Research
2015

K-STATE
TURFGRASS
RESEARCH

JULY 2015

Evaluation of New Zoysiagrass Experimental Lines for Winter Hardiness and Turf Quality in the Transition Zone

Ross Braun[1], Jack Fry[1], and Megan Kennelly[2]

Summary. A total of 881 zoysiagrass progeny originating from parental crosses at Texas A&M AgriLife Research – Dallas were planted in 2012, and an additional 104 progeny were planted by Kansas State University researchers in 2013. Starting in 2013, grasses were rated visually on 10 occasions through 2014. These ratings occurred throughout the year to evaluate winter survival and six turf quality characteristics to identify those progeny best adapted to the Kansas site. In September 2014, the top 20 of the original 985 progeny were selected and returned to Texas A&M AgriLife Research, Dallas, Texas, for propagation.

Rationale. Researchers at Texas A&M AgriLife Research, Dallas, Texas, and at Kansas State University, Manhattan, Kansas, have worked together since 2004 to develop and evaluate zoysiagrasses with higher quality than 'Meyer' zoysiagrass (*Zoysia japonica*) for adaptation in the transition zone. From this work, a number of advanced lines, resulting primarily from paired crosses between *Z. matrella* and *Z. japonica,* have demonstrated a level of hardiness equivalent to 'Meyer.' Collaboration between universities has been ongoing to evaluate new potential zoysiagrass lines that have equivalent or higher quality and cold-hardiness compared to 'Meyer,' along with improved resistance to *Rhizoctonia* large patch caused by *Rhizoctonia solani* Kühn [anastomosis group (AG)-2-2 LP], which continues to be the primary disease problem on 'Meyer.'

[1] Department of Horticulture, Forestry, and Recreation Resources
[2] Department of Plant Pathology

K·STATE
Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

K-State Research and Extension is an equal opportunity provider and employer.

Objectives. Evaluate winter survival and six turf quality characteristics to identify the progeny best adapted to the Kansas site and select experimental lines that have comparable or superior cold tolerance to 'Meyer,' along with improved turfgrass quality.

Study Description. A three-phase, six-year plan was developed by the collaboration among Texas A&M AgriLife Research, Kansas State University, and Purdue University, West Lafayette, Indiana. Phase I (year 1) was conducted at Texas A&M AgriLife Research, and involved crossing various cold-hardy zoysiagrasses with TAES 5645, a zoysiagrass that has demonstrated some resistance to large patch in growth chamber studies. The large patch resistance experimental hybrids and germplasm accessions were crossed with cold-hardy zoysiagrass parental lines ('Meyer' and 'Meyer' derivatives) (Table 1). A total of 985 zoysia progeny developed in Phase I were distributed to Dallas, Manhattan, and West Lafayette in 2012/2013 for field testing. Phase II (years 2–3) focused on field testing in the form of nonreplicated spaced plant nurseries comprising the newly generated progeny population that was conducted simultaneously by researchers at the three universities. In 2013 and 2014, progeny were visually rated for winter survival and six turf quality characteristics to identify those best adapted to the Kansas site (Figure 1).

Results. In September 2014, 20 progeny were selected from each of the three sites and sent to Texas A&M AgriLife Research – Dallas for propagation. Phase III (years 4–6) will begin in 2015 with the selected 60 progeny planted in the form of replicated field trials in larger plots, maintained under golf course fairway conditions, and extensive evaluation will be performed in the field at Manhattan, West Lafayette, and multiple locations in the transition zone. *Rhizoctonia solani* (AG 2-2 LP) will be inoculated on one-half of each plot at the Manhattan and West Lafayette sites, and the other half will be treated with a fungicide to evaluate for visible symptoms of large patch incidence as a result of inoculation. The objective is the development of one or more zoysiagrass cultivars with hardiness equivalent to or better than 'Meyer,' and turf quality and large patch resistance superior to 'Meyer.'

K-STATE TURFGRASS RESEARCH
K·STATE Research and Extension
Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

K-STATE TURFGRASS RESEARCH

Table 1. Zoysiagrass progeny coded family (crosses) evaluated at the Rocky Ford Turfgrass Research Center in Manhattan, Kansas, in 2013. For confidentiality, only species — and not cultivar names — are provided; 14 zoysiagrass control "checks" not included.

Coded Family #	Zoysiagrass Progeny Coded Family Cross Female x Male	Total #
6095	[(*Z. matrella* (L.) Merr. x *Z. matrella*) x *Z. japonica*] x *Z. japonica*	40
6096	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	66
6097	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	38
6099	*Z. japonica* x *Z. japonica*	152
6100	[(*Z. japonica* x *Z. pacifica* (Gaud.) Hotta & Kuroti) x *Z. japonica*] x *Z. japonica*	77
6101	(*Z. japonica* x *Z. matrella*) x *Z. japonica*	52
6102	*Z. japonica* x *Z. japonica*	115
6104	*Z. japonica* x *Z. japonica*	56
6105	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	5
6106	[(*Z. matrella* x *Z. matrella*) x *Z. japonica*] x Z. *japonica*	5
6109	(*Z. japonica* x *Z. matrella*) x *Z. japonica*	32
6110	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	51
6118	(*Z. japonica* x *Z. matrella*) x *Z. japonica*	30
6119	*Z. japonica* x [(*Z. matrella x Z. matrella*) x *Z. japonica*]	71
6120	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	24
6121	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	46
6126	(*Z. matrella* x *Z. japonica*) x *Z. japonica*	40
6220	(*Z. japonica* x *Z. japonica*) x *Z. japonica*	15
6221	*Z. japonica* x (*Z. japonica* x *Z. japonica*)	25
6222	(*Z. japonica* x *Z. matrella*) x *Z. japonica*	15
6263	(*Z. pauciflora* Mez. x *Z. matrella*) x *Z. japonica*	10
6315	(*Z. minima* (Colenso) Zotov *x Z. matrella*) x *Z. japonica*	6

K·STATE
Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

Figure 1. Field site of the 985 zoysiagrass progeny during the first field-testing year (2013) of Phase II in Manhattan, Kansas, on October 12, 2013.

K-STATE TURFGRASS RESEARCH

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service