

**Development of Large Patch Resistant and Cold Hardy Zoysiagrass Cultivars
for the Transition Zone**

2015 Update

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Objective: Phase III (year 3-6) of the evaluation process is focused on field testing in the form of replicated spaced plant nurseries comprised of the newly generated progeny population. The objective of Phase III field test is the selection of experimental lines that have comparable/superior cold tolerance to Meyer, fine texture, and large patch tolerance.

Update on Progress:

This was the first year of field evaluation for 60 zoysiagrass experimental lines after they were selected from 985 zoysiagrass progeny which were developed at Texas A&M AgriLife Research in Dallas, Texas by crossing 22 cold-hardy zoysiagrasses with TAES 5645. These progeny have also demonstrated some resistance to large patch in growth chamber studies.

In September 2014, twenty top-performing progeny were selected from the Manhattan location and sent back to Texas A&M AgriLife Research, Dallas for vegetative (clonal) propagation. Twenty additional selections were identified at each of the other two evaluation sites (West Lafayette, IN and Dallas, TX) and propagated in Dallas. In June 2015, all 60 progeny, plus controls (Meyer, El Toro, Chisholm, Zorro, Zeon), were shipped from Dallas, TX and planted in 6 by 6 ft. plots. The plots are maintained under golf course fairway/tee conditions in Manhattan. These progeny have also been planted in West Lafayette, IN; Dallas, TX; Blacksburg, VA; Chicago, IL; Columbia, MO; Fayetteville, AR; Knoxville, TN; Raleigh, NC; and Stillwater, OK. Growth vigor was rated on a 1-9 scale with 9 equaling maximum vigor. In 2016, after plots are fully established, one-half of each plot will be inoculated with the large

patch fungus; a similar inoculation will be done in West Lafayette, IN, and Fayetteville AR. The other aforementioned sites will evaluate zoysiagrass progeny for quality characteristics and large patch resistance based upon natural infestations.

Summary highlights:

- Over 900 unique zoysiagrass progeny from Texas A&M AgriLife Research-Dallas, each arising from a cross between a large-patch resistant parent and cold-hardy parent, were planted as single plugs in Manhattan, KS in 2012 and 2013.
- Grasses were evaluated for winter survival, color, texture, and quality in 2013 and 2014.
- In September 2014, 20 of the highest rated progeny were selected and sent to Texas A&M AgriLife Research, Dallas for propagation; 20 progeny were also selected in Indiana and Texas and propagated in Dallas.
- In 2015, the compiled 60 progeny were expanded into larger plots with three replications, maintained under golf course fairway conditions.
- In 2016, after the plots are full established, each plot will be inoculated with the fungus causing *Rhizoctonia* large patch to evaluate potential for resistance. Data will be collected on turf quality, fall/winter color retention, spring green-up, percentage winter injury, leaf texture, genetic color, and pest problems.



Fig. 1. Zoysiagrass plugs were planted on 22 July 2015 in Manhattan, KS.



Fig. 2. Part of the zoysiagrass study area at the Rocky Ford Turfgrass Research Center on Nov. 3 2015 in Manhattan KS, two weeks after the first frost.