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## Development of New Bermudagrass Varieties with Improved Turf Quality and Increased Stress Resistance

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### Objectives:

1. Improve bermudagrass germplasm for seed production potential, turf performance traits, and stress resistance.
2. Develop, evaluate and release seed- and vegetatively-propagated turf bermudagrass varieties for use on fairways, tee boxes and putting greens.
3. Assemble, evaluate and maintain *Cynodon* germplasm with potential for contributing to the genetic improvement of the species for turf.

**Start Date:** 2016

**Project Duration:** six years

**Total Funding:** \$300,000

Bermudagrass is the most widely used warm-season, sod forming turfgrass in the southern USA. Cold hardy, high quality turf bermudagrass cultivars developed and released at Oklahoma State University (OSU) have extended their use in the US transition zone. With the funding from the US Golf Association, the OSU turf bermudagrass breeding program has released seed-propagated cultivars ‘Yukon’ in 1996 and ‘Riviera’ in 2000, and vegetatively-propagated cultivars ‘Patriot’ in 2002, ‘Latitude 36’ and ‘NorthBridge’ both in 2010. The long-term goal of the OSU turf bermudagrass breeding program is to develop seeded and clonally propagated cultivars with high turf quality and improved resistance to abiotic and biotic stresses. Turf bermudagrass breeding and evaluation research activities performed by the OSU team in 2017 are summarized as follows.

One superior vegetatively propagated interspecific hybrid ‘OKC 1131’ developed by the OSU turf breeding program was released by the Oklahoma Agricultural Experiment Station in June, 2017 (Figure 1). The new cultivar has been tested in the 2013 National Turfgrass Evaluation Program national bermudagrass test (<http://www.ntep.org/bg.htm>). OKC 1131 has exhibited exceptional winter survivability, improved spring greenup, and excellent turf quality; always in the top performing group for these traits over the last four years in the NTEP test. OKC 1131 has significantly improved drought resistance and water use efficiency. The new cultivar has exhibited an excellent establishment rate, effective sod tensile strength for commercial sod production, improved salinity resistance, and high traffic tolerance as well.

Developing greens-type bermudagrass cultivars is an important component of the current project funded by the US Golf Association. Sixteen OSU experimental selections and four commercial cultivars (‘Champion Dwarf,’ ‘Mini Verde,’ ‘Sunday,’ and ‘Tifdwarf’) were tested for putting green turf performance in a replicated field trial established at the OSU Turf Research Center (TRC) in 2015 (Figure 2). In 2016, a second field trial was established including 11 OSU experimental selections and four standard cultivars (Champion Dwarf, Mini Verde, Sunday, and ‘TifEagle’). In the summer of 2017, a new green-type mowing trial of 17 OSU experimental selections and four commercial cultivars trial was established. Data collected in the three trials

include establishment rate, spring greenup, disease response (if present), as well as turf quality and its components under different mowing heights. The first trial will be terminated in the summer of 2018 while the two newer trials will continue in 2018 and 2019.

A replicated trial, including 35 OSU vegetatively-propagated experimental selections and four commercial cultivars ('Astro,' 'Latitude 36,' OKC 1131 and 'TifTuf'), 11 seed-propagated experimental synthetics and two commercial cultivars ('Riviera' and 'Monaco'), was established at the OSU TRC in the summer of 2017. Data for establishment rate was collected this year. Data for spring greenup, turf quality, disease response, and drought resistance will be collected in 2018 and 2019.

### **Summary Points**

- A new cold hardy, drought resistant, high turf quality bermudagrass cultivar, OKC 1131 was released by the OSU turf bermudagrass breeding program.
- Three sets of OSU experimental turf bermudagrass selections and commercial greens-type cultivars were tested in separate, replicated field trials for turf performance under greens management conditions.
- A new mowing trial of 46 experimental entries and 6 commercial cultivars was established in 2017.



Figure 1. ‘OKC 1131’ turf bermudagrass has fine leaf blades, dark-green color and dense sod as demonstrated in the 2013 NTEP national bermudagrass test plot at Wichita, KS (photo by Y.Q. Wu).





Figure 2. A field image of OSU experimental bermudagrass selections and four commercial standards in a putting green-type mowing trial at the OSU Turf Research Center, Stillwater, OK (photo by Y.Q. Wu).