

UCR Turfgrass Breeding Program

Improvement of Bermudagrass, Kikuyugrass, and Zoysiagrass for Winter Color Retention and Drought Tolerance

Marta Pudzianowska, Adam Lukaszewski, Christian Bowman and Jim Baird

Department of Botany and Plant Sciences

University of California, Riverside

Contact: 951-275-4024; mpudz@ucr.edu



Research Report Brought To You By:



Objectives

The UCR warm-season turfgrass breeding program has been focused on developing and testing new, improved genotypes of bermudagrass, kikuyugrass and zoysiagrass, for golf industry, athletic fields and homeowners. California has been experiencing drought for several years, affecting water availability and price. Extending the use of warm-season grasses, already better adapted to arid climates, and their further improvement for drought stress resistance can help tackle this issue. However, winter dormancy of warm-season grasses hampers replacement of cool-season with warm-season species, therefore developing new cultivars with improved color retention is also an important goal of our breeding efforts.

Project highlights

The primary location for developing and evaluating new genotypes is the University of California, Riverside (UCR). To find genotypes suitable for various regions of California, studies in Northern California and the Coachella Valley are also conducted.

The UCR breeding program cooperates with other breeders in United States working on warm-season grasses and provides test sites in California for their new lines.

University of California, Riverside

- During last 2 years ca. 1,600 hybrids of bermudagrass and ca. 280 hybrids of kikuyugrass have been planted and evaluated at UCR Agricultural Operations fields. Many of these hybrids show good quality and winter color retention/spring green-up and will be further tested in various locations across California and the Southwest.
- The best performing hybrids are going to be evaluated for drought tolerance. A new dry-down area including UCR hybrids and commercial checks was established and initially evaluated in 2019, and will continue in 2020. The study includes 76 UCR hybrids and 5 commercial cultivars (Bandera, Celebration, Santa Ana, TifTuf and Tifway II).
- Evaluation of lines of bermudagrass and zoysiagrass developed by Texas A&M, Oklahoma State University and University of Florida launched in 2016 continues, providing insight to their performance in California.
- In 2019 three new National Turfgrass Evaluation Program (NTEP) trials were established: Bermudagrass National Test (Ancillary deficit irrigation), Zoysiagrass National Test (Lawns) and Warm-season Putting Green National Test (including bermudagrass, zoysiagrass and seashore paspalum).

Northern California

- To meet demands for rough/lawn types of bermudagrass, 12 UCR hybrids selected from ca. 450 are being tested at Preserve at St. Lucia (Carmel-by-the-sea) against Bandera,

Midiron and Tifway II. These hybrids were selected based on their performance under 2-in mowing height and winter color retention.

- Commercial cultivars (Bandera, Celebration, Latitude 36, Santa Ana, Tahoma 31, Tifway II and TifTuf) and 4 top performing UCR accessions of bermudagrass (BF2, TP6-3, 10-9, 17-8), selected from ca. 450 hybrids created in 2013 are being tested on golf courses under regular fairway maintenance practices. Studies were established in 2019 at Napa Golf Course (Napa, CA) and Almaden Golf and Country Club (San Jose, CA) (2 fairways at each location). So far, Latitude 36 and 17-8 show the best performance.
- Improved lines of zoysiagrass developed at Texas A&M are being evaluated for their suitability in Northern California. Studies at Napa Golf Course (Napa, CA) and Meadow Club (Fairfax, CA) were established in July 2019 including 16 Texas A&M hybrids and 4 commercial checks (De Anza, Diamond, El Toro, Innovation).

Coachella Valley

- To test UCR hybrids suitable for rough/lawns in hotter and drier desert areas, a study with 12 UCR hybrids with the same design as at Preserve at St. Lucia was also established at West Coast Turf sod farm in Thermal, CA.

Acknowledgments

Support from the California Turfgrass and Landscape Foundation (CTLF), United States Golf Association (USGA), Metropolitan Water District (MWD) of Southern California, and Western Municipal Water District (WMWD) allowed us to resurrect the turfgrass breeding program at UCR by establishing a 5-yr project in 2016 entitled "Improvement of Bermudagrass, Kikuyugrass, and Zoysiagrass for Winter Color Retention and Drought Tolerance". The USGA also supports evaluation of zoysiagrass hybrids developed at Texas A&M. Thanks to West Coast Turf for expansion of UCR genotypes and for transportation and installation of sod in remote locations across the state. Also thanks to Delta Bluegrass Co. for donation and transportation of two cultivars to test locations in northern California.



Figure 1. Variation in winter color retention of bermudagrass hybrids created at UCR in 2018-19, Riverside, CA. Photo by Marta Pudzianowska, 12/31/2019.



Figure 2. Bermudagrass cultivars and UCR hybrids at Napa Golf Course, Napa, CA, 3 months after planting. Plot in the forefront of the picture is UCR hybrid 17-8. Photo by M. Pudzianowska, 08/28/2019.



Figure 3. Texas A&M zoysiagrass hybrids and commercial cultivars at Meadow Club, Fairfax, CA, 1 month after planting. Photo by M. Pudzianowska, 08/28/2019



Figure 4. Winter color retention of kikuyugrass hybrids created at UCR in 2019, Riverside, CA. Photo by M. Pudzianowska, 02/06/2020.