TURFGRASS RESEARCH

YEAR IN REVIEW

Sod Solutions® Professionals

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Introduction

Roberto Gurgel

Sod Solutions collaborates with institutions and universities in the detailed research and development of new turfgrass varieties while testing existing standards. We help breeders select and identify the best materials among the experimental grasses being tested. We have a firm commitment to the industry and to sod producers around the globe. We enjoy supporting these programs and other research initiatives like the National Turfgrass Evaluation Program (NTEP) trials and our own independent research on our products and their management. Sod Solutions continues to work on other ongoing breeding projects. Some of these projects are close to actual release to the market while others are still a few years away from a final result.

2022 was a pivotal year in the research and development of new and better turfgrass varieties. Research has taken us from the east and west coasts of the United States to Brazil, Argentina and Australia. The new turfgrass varieties released this year and in the coming years reduce inputs and are better for the environment while offering improved benefits for end-users.

We are excited to see what 2023 brings and want to update you on the progress of turfgrass research across the country and around the world.

Regards,

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Four New Grasses Released

Cobalt™ Hybrid St. Augustine

Lobo™ Zoysiagrass

Sod Solutions is known for many successful turfgrass varieties released over the years. Since our first release, Palmetto® St. Augustine in 1994, we have added many other varieties over the course of time including zoysias, bermudagrasses, centipede and even Kentucky bluegrass. The release of a new cultivar does not come without many years of testing and evaluations. The breeding effort and intensive work are done primarily by land grant universities across the United States.

Those institutions put a lot of time and diligence into crossing selected parent lines with the goal of selecting one of the resulting progenies coming from those crosses and to eventually release the final selection to the market. But the crossing and selections are just the first step of a long process. Then comes the evaluations and comparisons with the existing varieties to make sure that the newly selected line is in fact an improved grass, better than what already exists. This process can take eight or more years to complete.

❶ Cobalt™ Hybrid St. Augustine

Cobalt™ Hybrid St. Augustine was released by Texas A&M in January 2022 and it is a fast-growing, drought tolerant St. Augustine with excellent disease resistance and shade tolerance.

Sola™ St. Augustine

Celebration Hybrid™ Bermudagrass

❷ Lobo™ Zoysiagrass & ❸ Sola™ St. Augustine

Lobo™ Zoysiagrass and Sola™ St. Augustine were released from North Carolina State University. Lobo Zoysia, released in November 2021, is a low-input, fast-growing zoysia with less water and fertilizer requirements. It features a fine texture and stunning look. Released in August 2022, Sola has rapid lateral growth and excellent disease resistance.

❹ Celebration Hybrid™ Bermudagrass

Celebration Hybrid™ Bermudagrass was released from Mississippi State University in September 2022. Celebration Hybrid is an improved variety resulting from crosses of Celebration® Bermudagrass.

Celebration Hybrid has a finer texture than Celebration with fewer seed heads and with less thatch. It also has a better cold tolerance, performing well deep into the transition zone.

Sod Solutions understands how important and difficult it is to introduce a new grass into the market. At the same time, we also appreciate how tough it is for a sod producer to plant a new variety of grass. Removing existing varieties, preparing the land accordingly and planting takes a lot of investment, time and effort. We value and appreciate this tremendous commitment and hard work from our licensees and because of that we focus on bringing only the top performing new grasses to the market.

Celebration X Breeding Program

Mississippi State University

The Celebration X breeding program is celebrating almost nine years since its inception in 2014. The first improved variety in the program, Celebration Hybrid™ Bermudagrass (MSB 1017), was officially released in 2022. Indeed, this variety is a true hybrid, meaning it has 27 chromosomes. Because Celebration Hybrid has an odd number of chromosomes, it cannot produce viable seed and therefore is considered to be a sterile variety.

Celebration Hybrid

Celebration Hybrid was generated from a cross of Celebration® Bermudagrass and an African bermudagrass (Cynodon transvaalensis) selection that incorporated a different set of characteristics into the traditional Celebration: finer texture, less seedhead production, dark green color and better cold tolerance. Sod Solutions is proud and excited to introduce Celebration Hybrid to the market and its great performance and exceptional look are already leading golf courses and other potential clients to put in pre-orders when the grass becomes commercially available by late summer 2024.

Celebration Hybrid has been planted in several real-world test applications throughout the Southeast, including three golf courses in Florida: Country Club of Florida in Boyton Beach, Royal Poinciana Golf Club in Naples and On Top of the World GC in Ocala. Several sod farms have been trialing the grass ahead of its release. Star Farms in Sebring, FL planted Celebration Hybrid plugs in 10,000 Sq.

Ft. plots in June 2021 before expanding to 3 acres in June 2022. Quality Turf in Avon Park, FL planted sprigs of Celebration Hybrid as a foundation block in May 2022 on a 3/4 acre. Superior Turf and Pike Creek Turf Farms, both located in Georgia; Billy Mayfield Farms and Murff Turf Farms in Texas and Inman Sod in North Carolina also have trial plots of Celebration Hybrid.

The Celebration X Program does not end with the release of Celebration Hybrid. Two additional experimental lines, Celebration Dwarf™ and Celebration Plus™ are expecting release in 2023.

Celebration Dwarf (MSB 1050)

Celebration Dwarf (MSB 1050) is a dark green variety with an excellent root system that has minimal vertical growth. Its dwarf-like growth rate can be attractive to many golf courses for use on tees, approaches and similar applications. Celebration Dwarf has a great blocking ability due to its strong root system. Preliminary data also indicates it has a good shade tolerance, compared to other bermudagrasses. This is most likely an inherited trait from the original Celebration Bermudagrass which has very good shade tolerance as well. Celebration Dwarf is being tested at golf greens height to evaluate its potential for greens use. It does have a small leaf blade and short internode, suggesting it might be a good option for golf greens, if ball speed tests are favorable.

Celebration Plus (MSB 1080)

Celebration Plus (MSB 1080) has a very aggressive growth pattern, showing it can quickly cover the ground and recover from damage like wear and divots. Celebration Plus also has a very deep and strong root system which will most likely deliver a very good drought tolerance. Further testing is required to determine the rate of seed head production.

A fourth variety being considered for release is MSB 1042, which has fine texture, a lighter green color and a very fast green-up in the spring. It is also a very fast growing variety with a more open canopy. Having less density and a more open canopy leads to less thatch accumulation. This means less verticutting and aerating requirements and less maintenance overall, making it a good candidate for residential use.

Celebration Hybrid, Celebration Dwarf and MSB 1042 are still performing well in the current National Turfgrass Evaluation Program (NTEP) bermudagrass trials.

CELEBRATION PLUS™ BERMUDAGRASS

MSB 1080

CELEBRATION HYBRID™ BERMUDAGRASS

MSB 1017

CELEBRATION dwarf™ BERMUDAGRASS

MSB 1050

Turf Research Florida Low Input Bahia/St. Augustine

University of Florida • The Turfgrass Producers of Florida

The Turf Research Florida Low Input Bahia/St. Augustine Program (TRF Low Input Program) is a collaboration between the University of Florida, the Turfgrass Producers of Florida (TPF) and Sod Solutions. The TRF Low Input Program's main goal is to breed, select and release St. Augustine grasses and Bahiagrasses that require fewer inputs from farms and end-users and that will handle Florida-specific environmental challenges like Lethal Virus Necrosis (LVN), drought, disease, insects, etc.

TURF RESEARCH FLORIDA
Low Input Bahia/St. Augustine

TRF St. Augustine Grass plots at the UF Plant Science Research and Education Unit in Citra, FL.

TRF Bahiagrass plots at the UF Plant Science Research and Education Unit in Citra, FL.

The release of future improved grasses from the University of Florida Turfgrass Science Program in Florida and worldwide will be done through Sod Solutions, which will be the licensing and marketing agent for any new grasses resulting from the program. The program is still in its early stages with UF Turfgrass Breeder, Dr. Kevin Kenworthy, evaluating some existing selections of St. Augustine Grass and bahiagrass that have shown good potential. The main focus is to find bahiagrasses that will use less water, look green under drought stress and use less fertilizer to stay green. Other important characteristics are high seed production yields for lines that can be used as seed producers or reduced seed head production for lines to be selected for high aesthetic appearance.

In 2022, TPF members and all known Florida sod farms were solicited to become a contributor to the TPF Low Input Program. Below is a list of the 17 farms who have committed to sponsoring the eight-year program:

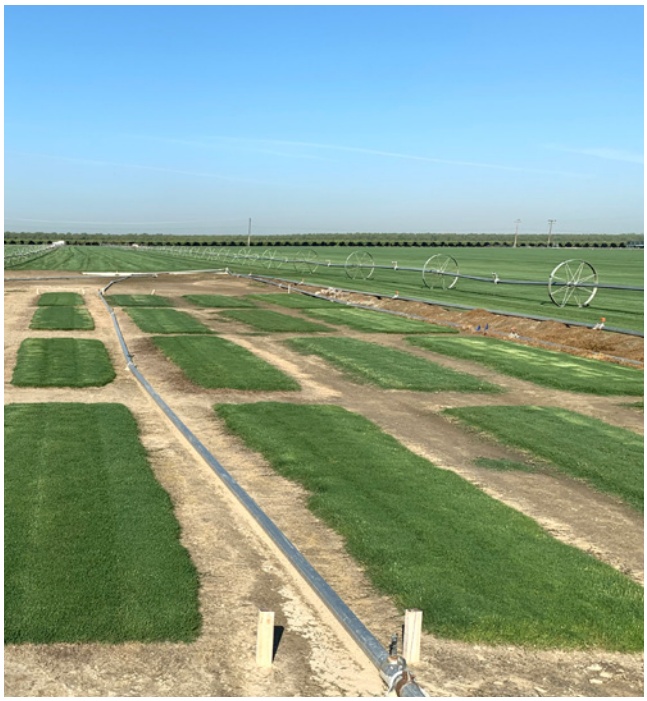
- Action Sod
- Agriturf, Inc.
- Bayside Sod
- Bethel Farms
- Collier Family Farms
- Council Growers Sod
- Duda Sod
- Florirturf Sod
- Island Turf
- King Ranch Turfgrass
- Lake Jem Farms
- Star Farms
- Tater Farms Turfgrass
- Travis Resmondo Sod
- TurfPro Services
- Willaway Sod Farms
- Woerner Companies

Turf Research Bermuda California

Oklahoma State University • A-G Sod Farms

The search for a new and improved bermudagrass for California is over. After six years of testing over a hundred experimental lines in the Southern and Central California climate, the top candidate was identified: OC-09.

The Turf Research Bermuda California (TRBC) project is a partnership between A-G Sod Farms, Oklahoma State University (OSU) and Sod Solutions. The research project was created with the objective of identifying a new bermudagrass variety with high agronomic performance in the southern and central parts of the state. Winter color retention and drought tolerance are the two most desirable characteristics sought after in the new grass. Additionally, dark green genetic color, less seedhead production and reduced vertical growth were also important and needed to be incorporated into the final selection as well.



Initial Experimental Design

One hundred experimental bermudagrass selections developed by OSU were established in a randomized complete block design in three replications. The trial was planted at A-G Sod Farm in Nuevo, CA on May 17, 2016. After three years of testing, 11 experimental lines were selected and moved to the second phase. The selection was based on the traits mentioned above.

The top 11 entries selected were:

OC-09	OC-26	OC-44
OC-10	OC-35	OC-55
OC-15	OC-37	OC-91
OC-22	OC-42	

Second Phase

The objective of the second phase was to test sod strength, drought tolerance and cold tolerance at two locations: Nuevo and Fresno.

The experimental layout was 5-by-20-foot plots with two replications. Each plot was planted with plugs produced in a greenhouse in Nebraska during the early spring of 2019. Plug trays were planted using sprigs collected in Nuevo at the original plots.

The test plot area was planted in April 2019

(Nuevo) and in May 2019 (Fresno). After several evaluations during the summer of 2019 including a dry-down period, four final candidates were selected to advance to a third and final rounds of testing.

OC-09	OC-44
OC-10	OC-243

Third Phase

The third phase was planted in June 2021. All final four selections were planted in Nuevo and Selma, CA. This time plot areas were much larger (20-by-25 feet) in order to allow harvesting to test tensile strength and also provide more plant stock material for expansion of the final selection. Besides evaluating the performance of the grasses during the summer, winter color was rated during the winter of that year and all four experimental lines went into a dry-down period during August 2022.

The experimental line OC-09 had the best summer performance as well as the best look during and after the dry-down period. OC-09 also had the best tensile strength of the final four selected lines. Results were the same in Nuevo and Selma, which confirms the ability of OC-09 to perform well in all locations.

OC-09 will be expanded in 2023 into a Breeder Block area, between half an acre to one acre in size. The location is still to be determined but it will probably be in Central California at one of AG's sod farms. It will be the starting point and the source of plant stock material for future expansions. OC-09 will receive a commercially trademarked name in 2023.

Timeline Summary

- **2016** — Planting of 100 Entries in Nuevo, CA
- **2017** — Evaluations & Ratings Collected
- **2018** — Evaluations & Ratings Collected
- **2019** — Selection of the 11 Best Entries & Planting of the Second Phase
- **2020** — Evaluations & Ratings Collected & First Dry-Down Test
- **2021** — Selection of the Best Four Entries & Planting of the Third phase
- **2022** — Evaluations & Second Dry-Down Test
- **2022** — Final Selection: OC-09

Turf Research Ultrafine Zoysia

University of Florida • Clemson University
Modern Turf • J.W. Turf • Atlas Turf

Ultrafine zoysia plots at Modern Turf in Rembert, SC.

Ultrafine zoysia plots at Wyndemere Country Club in Naples, FL.

The trend of ultrafine zoysias for use on golf putting greens is still going strong. Ultrafine zoysias offer a dense, smooth surface with less visible wear and much better winter color than their counterparts, ultra-dwarf bermudagrassses, which normally go dormant more rapidly in colder temperatures.

University of Florida Professor and Turfgrass Breeder Dr. Kevin Kenworthy is testing several experimental zoysia lines for greens. The focus is on developing varieties with less thatch, better winter color, fewer maintenance needs and high ball speed. These developing lines are being tested at several locations including Modern Turf in South Carolina and J.W. Turf in Florida. They are also being evaluated at Clemson University (Page 13) and at a demo site in Southeastern Brazil.

Ultrafine™ Zoysia Program

Growing and evaluating experimental ultrafine zoysias for greens is difficult and very demanding in terms of maintenance. All plots need to be maintained at greens height (below 0.125) with a reel mower and some locations do not have that kind of equipment at their disposal all the time. The climate also had an impact on the plots at the University of Florida. Last winter's low temperatures left many entries with a high amount of winter damage, making it impossible to collect data from it this year. The plots are in recovery mode and should produce more info next year.

Research Trial at Clemson University

Clemson University • Nimmer Turf • Green Acres Turf Farm • Carolina Fresh Farms • Modern Turf

Sod Solutions is happy to have an opportunity to participate in some trials and tests at Clemson University with our varieties. Clemson University has a tradition of researching turfgrasses, maintenance operations and products related to the turfgrass industry.

Last year, we started the research collaboration with Clemson University with four different projects: testing experimental lines of ultrafine zoysiagrasses developed by the University of Florida, evaluating elite lines of the Celebration X breeding program from Mississippi State University, testing new ultra-dwarf bermudagrasses and evaluating recently released grasses like Innovation® Zoysiagrass, Lobo™ Zoysiagrass and Lawnifi Santee® seed. The ultrafine zoysias have all progressed about the same. On average, they were approximately 95% covered. However, since they were plugged, they are still extremely uneven and will require extensive topdressing, aeration, etc., to achieve a level where we can accurately gauge stimp readings. A few plots did have bermudagrass breakthroughs and were spot treated with glyphosate, resulting in some bare patches. Fortunately, towards the middle of summer Clemson researchers became comfortable with a new herbicide safener and implemented it in the bermuda control program, allowing the zoysias to continue to cover and completely eliminating the bermudagrass.

All of the lawn-type bermudagrasses had 100% coverage this summer, including the three plots re-plugged early in the season. However, due to the uneven establishment timing of the plots, Clemson researchers didn't collect any data as the plots didn't become uniformly covered until late summer. Clemson will start with greenup readings in Spring 2023. As an observation, the Celebration X breeding program lines had improved consistent color, finer texture and higher density than the original Celebration® Bermudagrass. Several of those grasses appear promising.

Sod Solutions and the researchers at Clemson University will continue to follow up the development of each project in 2023.

Research plots at Clemson University.

Brazil Research

This project started two years ago in January 2020 and the goal was two-fold: 1) Test and evaluate the adaptability of new grasses in São Paulo State, and 2) create a display with grasses from different species to show to students, landscapers and sod producers.

Sprigs of four commercial grasses and four experimental grasses at that time were brought from the US to Brazil and used to plant plug trays. The planting involved graduate students and the leading researcher at FCA Botucatu which is a campus dedicated to Agronomy and Agro Sciences belonging to Sao Paulo State University. The commercial grasses planted were: CitraBlue® St. Augustine Grass, Innovation® Zoysiagrass, Sunday® Ultra-Dwarf and Latitude 36® Bermudagrass while the experimental lines were: MSB-1026, MSB-1050, FZ-1662 and FZ-1367. The MSB lines are part of the Celebration X breeding program. The FZ lines are part of the University of Florida ultrafine breeding program.

Sprigs of each grass were planted in 72 cell trays on January 7, 2020. After planting the sprigs, the trays were kept in a greenhouse with a good supply of water and fertilizer to grow and mature. After three months, the plugs were planted on a prepared area for testing. The area had its top surface removed with fraise mowing equipment so that no contaminants were left in the soil profile that was going to be planted with the new grasses. Each grass was planted on a plot area measuring 200 square feet to facilitate visualization of the main characteristics of each grass such as leaf texture, genetic color and overall quality. All plots grew in well and were fully grown in by January 2021.

All plots are being maintained with proper irrigation, mowing and fertilizer. After a year growing to maturity, preliminary results show that CitraBlue is displaying the darkest green color among all plots while Latitude 36 was the fastest to cover 100% of the ground. The ultrafine zoysia lines FZ-1662 and 1367 had problems with weed competition because they are slow growing varieties compared to the others tested there. However, after the initial period of establishment and with special attention from the local maintenance team, they grew in well and are looking good.

The plots were showcased during the VIII SIGRA, a grass conference held in Brazil in October 2022. This was a great opportunity to show students, landscapers and architects the differences between a zoysia, a bermuda, a St. Augustine and ultra-fine zoysias.

Innovation Zoysiagrass with its finer texture compared to the local zoysia standard, caught the attention of several Brazilian producers. Zoysias make up 80% of the Brazilian market and Innovation, with its great shade tolerance, is positioning itself to be a great option for that market. Latitude 36 also received a lot of attention from sports field managers and golf course owners.

Future Research

Sod Solutions will continue collaborating with different breeding programs from many land grant universities across the country. The goal is always to develop better and improved varieties of grasses that can help sod producers to be more efficient and consumers to enjoy grasses that are better for the environment and easier to maintain.

2023 was a year that many new grasses were released into the market. Sod Solutions will now develop more specific best maintenance practices for each of those new grasses. We will continue to collaborate with alternative species like Axonopus compressus, Axonopus affinis and Paspalum notatum (bahiagrass). All of these are excellent options for reducing water usage in applications where water availability is an issue. Developing low input turfgrass varieties is an answer to the growing global concern of resource shortages. Grasses that are more water-efficient, shade tolerant and resist disease better are just part of making this world more balanced. It may be a small part, but we are doing what we can to help future generations live in a better place.

Roberto Gurgel observes turfgrass trial plots in Brazil.

Sod Solutions®

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