



CitraBlue® St. Augustine White Paper

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Introduction

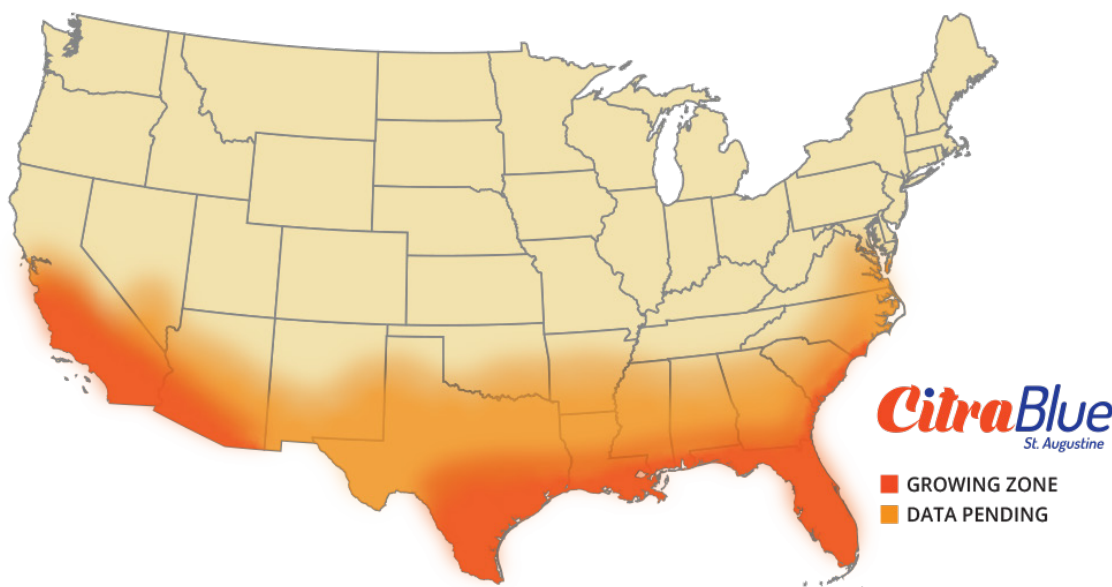
The University of Florida's continued research and evaluation of some of the most promising lines of St. Augustinegrasses received a helping hand in 2015. 23 Florida turfgrass growers chipped in to fund a program at the university looking for an improved St. Augustine variety. This grass needed to have an improved drought tolerance over Florida's common St. Augustine, Floratam. The grass needed to have improved resistance to disease, better shade tolerance and better overall performance in Florida's demanding climate. CitraBlue® was born from the program offering improvements on almost all traits of Floratam while also showcasing an extremely different, dark, blue-green color. CitraBlue was made for Florida but is found outside of the state as far away as Hawaii.

CitraBlue®
St. Augustine



Valencia Palms | Delray Beach, FL

Why St. Augustine and Why CitraBlue?



St. Augustinegrass originated in the tropics and was cultivated for its success in warmer and coastal regions. The variety typically doesn't have a good tolerance to cold, thus making it a more southern and coastal variety in the United States. St. Augustine thrives in states like Florida and Texas where frequent heatwaves can be an issue. In fact, Floratam St. Augustine, a variety released in the 1970s by the University of Florida and Texas A&M University, is Florida's most common grass type. Improved varieties like Palmetto St. Augustine have a high level of shade tolerance needing only about 3-4 hours of direct sunlight. All of these attributes make St. Augustinegrass an attractive option for many parts of the country and around the world.

Some of the drawbacks of St. Augustine include susceptibility to turfgrass diseases, especially in more tropical regions and where the grass is put in the shade. Also, while St. Augustine varieties will typically hold their color longer with lack of water, they are typically dying when a drought begins to turn them brown while other grass varieties like zoysia and bermuda go dormant as a protective step. Some of these common issues were the impetus for researching a new variety in Florida.

After years of research and narrowing selections, CitraBlue St. Augustine was released as a better option that offers improved performance in many of these key problem areas.

Origins

In the quest for an improved St. Augustinegrass to meet the specific needs of the state of Florida, University of Florida turfgrass breeder Dr. Kevin Kenworthy teamed up with plant pathologist Dr. Phil Harmon and entomologist Dr. Adam Dale. The researchers began to focus on identifying and testing numerous lines of St. Augustinegrasses to find one better than Florida's common St. Augustine variety, Floratam St. Augustine. Their goal was to develop a St. Augustinegrass with improved drought tolerance and better disease resistance that exhibited a rich, dark color. Additionally, they desired a grass with better shade and cold tolerance as compared to Palmetto® St. Augustine or Raleigh. Lines that proved promising, thus making the shortlist, were planted at production centers around the state. This allowed the growers to evaluate and provide valuable feedback on disease pressures, how long the grow-in period took, nutritional inputs and the overall performance.

In 2018, the final selection from the program (CitraBlue) was released under the university research name FSA 1602. A minimal amount of grass, about 4,500 sq. ft., was made available in 2018 to those growers who were interested in establishing a seedbed to use for future expansions. Now the grass has expanded across the state of Florida and around the country where St. Augustinegrasses are found.



Characteristics & Features

CitraBlue has a number of characteristics that are improvements to other grass varieties on the market today. While the breeding objectives were met, this grass goes above and beyond in a number of different feature sets including mowing frequency, disease resistance, weed control, drought response, shade adaptability and of course, the color.



**Striking
Blue-Green Color**



**Exceptional
Shade Tolerance**



**Improved Disease
Resistance**



**Naturally Weed
Resistant**



**Improved Drought
Resistance**



**Reduced Mowing
Frequency**

Disease Resistance

Turfgrass disease is an issue for grasses in semi-tropical and tropical locations where rain and night temperatures at certain times of the year make for inviting disease-friendly environments. Three of the most common diseases to infect St. Augustine varieties are large patch, grey leaf spot and take-all-root-rot. A study was conducted at the UF IFAS Plant Diagnostic Center to evaluate disease severity and turf quality across multiple St. Augustinegrasses over the course of a year. The study states that CitraBlue is as resistant to large patch as Floratam St. Augustine and more resistant to gray leaf spot and take-all-root-rot than Floratam.

CitraBlue breeder, Dr. Kevin Kenworthy talks about how CitraBlue compares in disease testing.



"CitraBlue has a similar level of tolerance to large patch as Floratam. It will get less large patch compared to other tested commercial cultivars of St. Augustinegrass. With grey leaf spot, CitraBlue will get some but will incur less damage from this disease compared to other cultivars of St. Augustine. Finally, CitraBlue has performed well and maintained good stand persistence under conditions suitable for the development of take-all-root-rot. In these tests, CitraBlue outperformed Floratam and Palmetto."

Disease and shade in grass go hand-in-hand in the turfgrass world. Based on testing and real-world applications, CitraBlue looks to be one of the most shade-tolerant varieties. When a grass typically gets placed into low light situations, water on the grass blades and wetness in the soil remain longer as drying time is increased. The expanded exposure to that moisture, when conditions are right, leads to disease outbreaks. As a very shade tolerant variety, inevitably CitraBlue will be put in shady areas where those outbreaks happen. So having an ability to maintain and survive in those disease-ripe conditions meets the need of many homeowners and professionals maintaining commercial landscapes.



Shade Tolerance

One of the most pressing questions from people looking to put in a new lawn is, “What works well in the shade?” While that question depends on many external factors, it also depends on genetics. Some grass varieties deal with low light environments better than others and among those varieties, there are many levels of tolerance with grasses on the market.

CitraBlue was painstakingly bred over many years with shade in mind. In studies conducted by UF over a two-year period, CitraBlue was much better than both Floratam and Palmetto® St. Augustine in head-to-head studies in the shade tests. What gives CitraBlue a competitive edge over both Floratam and Palmetto is not just its shade tolerance, but its improved disease resistance.

Shade was one breeding objective successfully realized by the CitraBlue breeding project. This will allow homeowners with difficult light challenges to have success in their yards.

**Note: All grasses need some amount of sunlight. There are locations where grass might not be right for a landscape due to light insufficiencies.*



Drought Fighting

Bermudagrass and zoysiagrass varieties have a built-in defense mechanism called dormancy that begins to shut down to protect the grass from damage when water is removed for an extended period of time (drought). CitraBlue St. Augustine may not be a bermuda or zoysia, but should be in the 'best grasses for drought' conversation.

Most St. Augustine varieties give the impression of being good drought grasses at first. They typically hang on to their color longer in low-water, dry conditions. But when they begin to go brown, they are typically dying, unlike bermuda and zoysia. In the years of research and in several evaluations, CitraBlue maintained adequate turf quality and stand persistence when other St. Augustinegrasses declined in quality due to drought stress. We asked the CitraBlue breeder, Dr. Kevin Kenworthy how this looks to the end-user.

"CitraBlue is slower to develop drought stress symptoms and suffer damage," said Dr. Kenworthy. "If moisture is limiting to the point of damage, then CitraBlue is able to recover quickly when adequate moisture returns."

All of this should give some confidence to the consumer. Droughts and water restrictions come and go, typically every few years. Having a grass variety that will be ready when those times come is a wise strategy. It also shows that excessive watering is not needed with CitraBlue and that is better for the environment as a whole.



Weed Resistance

Weeds are typically seen as a nuisance for lawns and gardens. For typical St. Augustine varieties, weeds can be a challenge because of the open growth habit of many varieties (the spacing between grass blades and stolons allowing sunlight to get down to the soil level where weed seed germinates). CitraBlue isn't a typical variety and features a tighter canopy, naturally stopping many weeds from getting started.

"CitraBlue has a unique dense growth habit compared to other cultivars of St. Augustinegrass," said breeder Dr. Kevin Kenworthy. "Its density, compared to the more upright open growth habit of Floratam, shades the soil preventing weed emergence."

The benefits to the environment can't be diminished. Instead of needing control chemicals like 2, 4-D and glyphosate, a more natural prevention takes place based on grass thickness and compactness. Any weeds that do make it to the surface will be more easily identified due to their typical lighter green color in contrast to the dark, blue-green blades of CitraBlue.



Reduced Mowing

One of the interesting traits of CitraBlue is a reduced mowing frequency, especially when compared with common varieties like Floratam. CitraBlue has a very unique, thicker lateral growth that most other St. Augustinegrasses in the industry don't feature. This thicker lateral growth characteristic keeps it from needing to be mowed nearly as much in comparison to Floratam since it tends to grow more laterally instead of increasing in height. It can also be grown with a lot less fertilizer, which is great for the end-user and the environment. As far as just how high it should be maintained, breeder Dr. Kevin Kenworthy says optimally anywhere from 2.5–3.5 inches in height.

"We are looking at CitraBlue under a couple of different mowing heights and it is performing well compared to Floratam and can be mowed at a shorter height," said Dr. Kenworthy. "But it will also do well at the mowing heights that you would typically mow for Floratam. Also, the leaf elongation rate of CitraBlue is significantly slower compared to Floratam. One or two mowings can easily be skipped with no concern of scalping CitraBlue."

To illustrate his point, Dr. Kenworthy sent these photos after returning from a week away from home. He has both Floratam and CitraBlue in his yard for comparison and is standing on the split. On the right side of the photo is CitraBlue and on the left is Floratam. The difference is considerable.



Unique Blue-Green Color

CitraBlue got its name from its distinctive blue-green color and for its development at the **UF/IFAS Plant Science Research & Education Unit** at Citra, FL. One of CitraBlue's main breeding objectives was to demonstrate superior characteristics to Floratam including a striking blue-green color.

CitraBlue breeder Dr. Kevin Kenworthy states, "One of the hallmark features of the grass is that it has a really unique blue-green color that's extremely attractive. It's very striking to look at it and when you see a landscape planted in it, it really pops."

Chris Leffler at A. Duda & Sons Inc., a sod farm in Oviedo, FL goes on to say, "Almost immediately we noticed in many replications of this particular variety that it stood out in color all the time. It's just a very unique dark, blue-green color. So when trying to ignore your biases in looking at things scientifically, it was impossible. You always knew where that product was. So I was very interested to look at it from that standpoint initially."



CitraBlue (left) vs. Floratam (right)

CitraBlue Comparisons with Other Turfgrass Varieties

CitraBlue Compared to Floratam St. Augustine

CitraBlue St. Augustine was created by the University of Florida to improve on Florida's common St. Augustine, Floratam. Developed in the 1970s, Floratam was originally developed for chinch bug resistance but that trait has disappeared over the years as the bugs adapted. CitraBlue improves on Floratam in nearly every way. It features better color, better density, better resistance to disease, slower vertical growth, much better shade tolerance, better insect resistance and a striking overall appearance. It is an all-around improved grass.



Floratam (left) vs. CitraBlue (Right)

CitraBlue Compared to Palmetto® St. Augustine

Palmetto® St. Augustine has been around for almost 30 years and around the world, is the most patented turfgrass ever sold. CitraBlue rivals shade-tolerant Palmetto in its ability to withstand sunlight limitations. CitraBlue is, however, better at fighting off disease making it an improvement for those areas. Palmetto was initially selected as a cold-tolerant cultivar and it does get the nod in that department over CitraBlue. But CitraBlue's disease resistance, better insect resistance and reduced mowing requirements are what make it stand out over its decades-old rival.



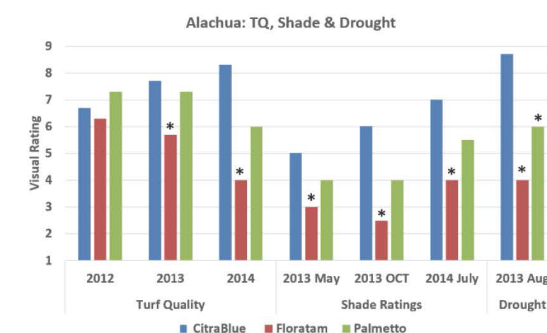
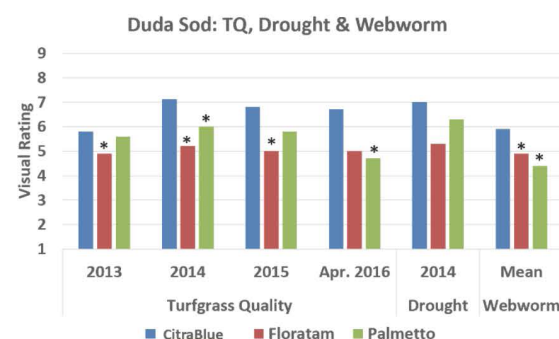
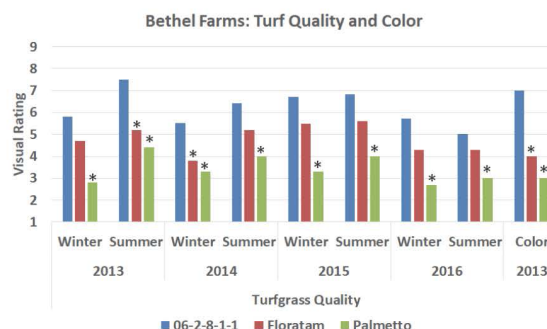
UF/IFAS Breeding Objectives and Research Summary

Breeding Objectives for CitraBlue:

1. Equal or better drought and disease resistance as Floratam
2. Equal or better shade and cold tolerance as Palmetto/Raleigh
3. Good turf quality and adapted throughout Florida

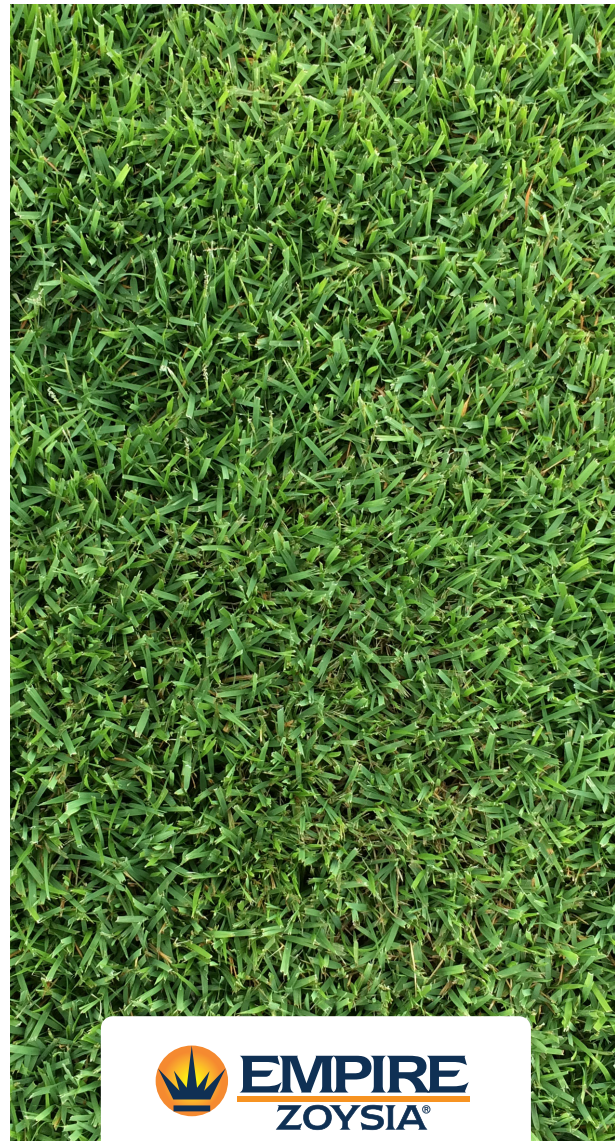
- Developed in 2006
- Evaluated in five Florida locations: Jay, Alachua, Citra, Melbourne (Duda Sod) and Arcadia (Bethel Farms).
- Evaluated for drought responses in Texas, Oklahoma, Georgia, North Carolina and Florida
- Disease evaluations ongoing at Citra with Dr. Harmon
- Included in NTEP trial at 8 locations from Texas to North Carolina

- For data shown to the right an * means that CitraBlue was statistically better than the cultivar with an *.
- Shown to be well-adapted through Florida
- Unique blue-green color
- Denser canopy compared to Floratam
 - More competitive against weeds
- More shade tolerant than Floratam
- More resistant to gray leaf spot compared to Floratam
- Less susceptible to take all root rot compared to Floratam
- Less susceptible to large patch compared to other shade tolerant St. Augustinegrass cultivars
- Improved drought persistence compared to Floratam
- Recently approved for commercial release
- Currently under increase with sod producers
- Expect to have limited commercial sales in late 2019
- Widespread availability in 2020.



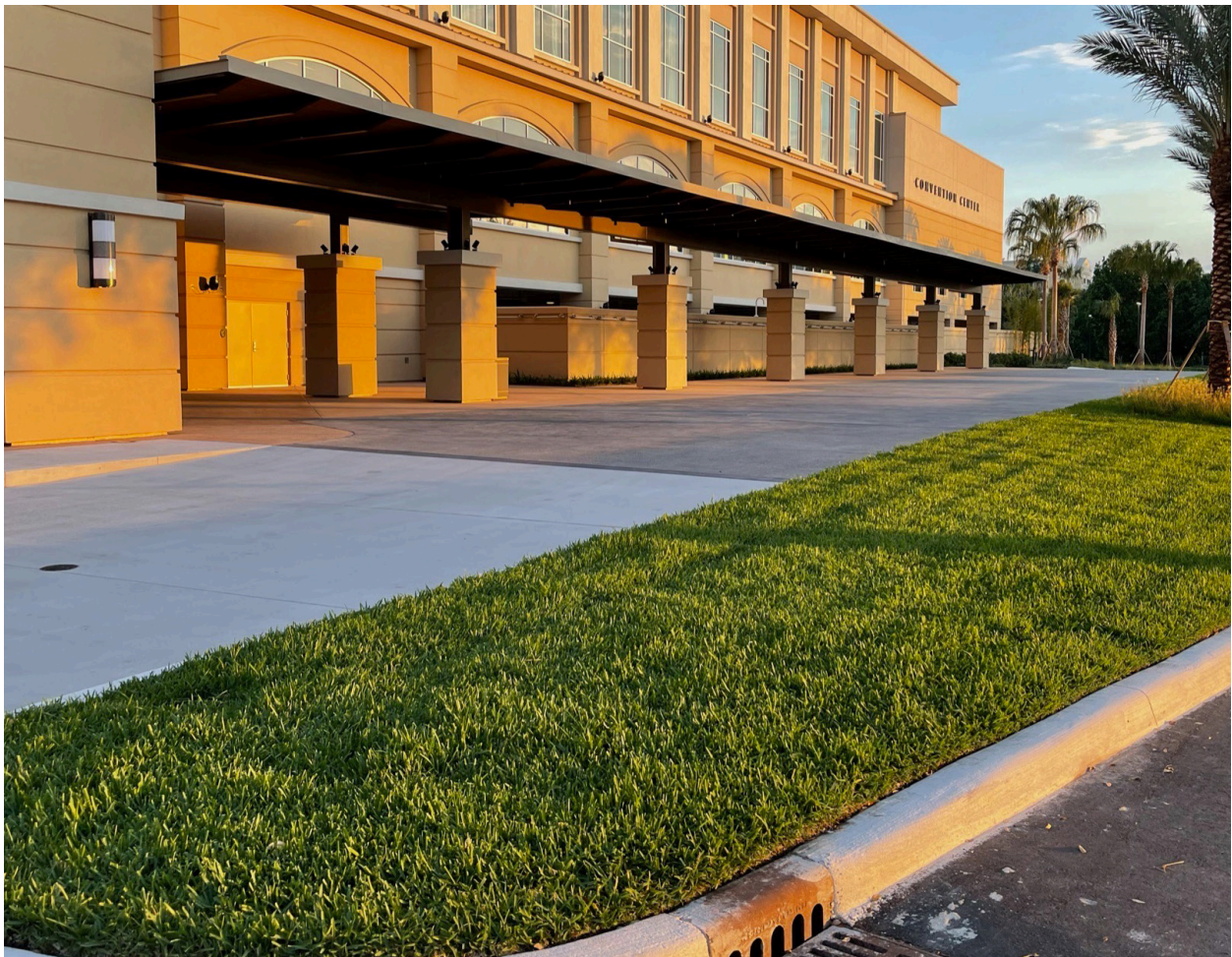
CitraBlue Compared to EMPIRE® Zoysia

EMPIRE® is a popular zoysia variety in the southern states as it has wider blades and features a more St. Augustine-like appearance. It is a lighter shade of green than CitraBlue but doesn't have its shade tolerance. EMPIRE will recover more rapidly from damage which is why it is used in golf applications. EMPIRE isn't resistant to disease like CitraBlue but it does recover from disease damage quickly. CitraBlue will have a distinctly different look than EMPIRE.



CitraBlue St. Augustine in Residential and Commercial Landscapes

CitraBlue works well for commercial and residential landscapes and communities. It will look distinctly different from most other grass types based on its color. CitraBlue needs less mowing which benefits these environments and if kept healthy, should need fewer inputs like fertilizer, herbicide, insecticide and fungicide. It was developed and selected to improve other grass options in Florida and around areas where St. Augustine cultivars are commonly used.



Case Studies

Valencia Palms

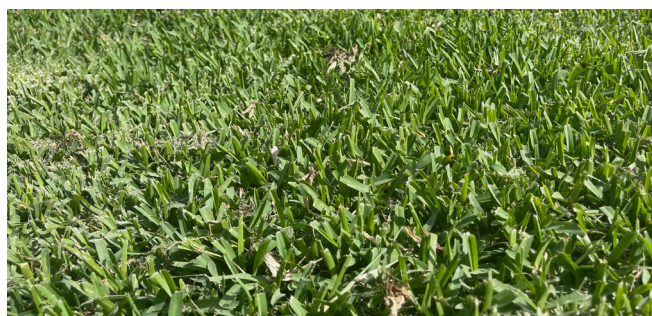


Residential and Commercial | Delray Beach, FL

The Valencia Palms neighborhood in South Florida made a move to switch out their Floratam St. Augustine after Lethal Viral Necrosis took out many of the lawns and common areas in the community. The University of Florida's newest grass, CitraBlue St. Augustine, checked all of the boxes and fit the bill for what Valencia was looking for. Its disease resistance, its shade tolerance and its remarkable color made it Valencia's choice replacement.

"It has excellent disease resistance. It has good shade tolerance. It has good drought tolerance...all of those things made a lot of sense and we felt that what we had tried in the past didn't work but we felt strong enough about it after consulting with our board of directors that we all made a conscious decision that this was the best direction for us to go."

— Harvey Cohen, Valencia Palms Committee Chairman / Resident



Summary

To solve many of Florida's turfgrass issues related to climate, soils and other environmental factors, the University of Florida led by turfgrass breeder Dr. Kevin Kenworthy set out to develop a new St. Augustine variety. This grass needed to provide a solution to these issues and be able to be taken outside of the state effectively. After years of breeding and observations, CitraBlue was selected. This grass provided an answer to many of the problems encountered. While it didn't erase things like disease pressure, it did help to mitigate it with a better performing variety with some built-in prevention mechanisms. CitraBlue also happens to have one of the most striking appearances of any warm season turfgrass variety. This grass stands out, not only on performance metrics but on outward appearance. It is the first release from Florida in over a decade and certainly has the marks of a sustained winner long term.



Sod Solutions Pro

Sod Solutions has been researching, developing and releasing to the market new turfgrass varieties for the past 27 years. Our new professionally focused arm of the company, Sod Solutions Pro takes that industry knowledge and puts it to use, facilitating large-scale turfgrass projects from beginning to end.

From our decades in the industry, we know that choosing a grass for a variety of landscape challenges can make or break a project. Different landscapes, geographies, applications and even soil pH levels could call for different grass varieties. Each cultivar has specific features (like shade tolerance) that make them more suitable for certain applications than others. Our mission is to make sure the right grass is being used in the right location to produce the best long-term success for our clients.

SELECTION CONSULTING:



Our team of turf experts will help inform you of the turfgrass options suitable for your project location, educate you on the pros and cons of each product, answer your technical questions, and connect you with real professional users to provide a complete understanding and confidence in the product you choose to specify. We also offer lunch and learns onsite as well as online webinars to educate your staff on turfgrass options.



SPECIFICATION WRITING:

We will create specifications for submission with the project scope and the grass variety that you have selected.



PRODUCT SOURCING:

No job is too large or too small. Sod Solutions Pro has a dedicated network of over 250 turf farms worldwide. From small parks to entire communities and golf courses, we can source projects from one or multiple farms if need be. Whether you are in the initial budgeting stage or need to order grass immediately, the Sod Solutions Pro team will provide you with availability data and pricing for your project.



DELIVERY / INSTALLATION LOGISTICS:

Sod Solutions Pro will find the farm, schedule the delivery and manage the installation of the grass when you need it. Door to door, we take the burden of grass logistics to a new technological level with our proprietary farm management software, Turf Logistics.



FINANCING:

We work with banking infrastructure to take on the financial strain of financing large grassing projects. Our fees are minimal and worth the headaches it reduces for your team.



MAINTENANCE CONSULTING:

Having issues with the health and vitality of your existing grass? Let our team of experts assist with on-site visits, problem diagnosis, and solutions. We will get to the bottom of the issues and lay out a plan to fix the problems.

Request a Free Lunch & Learn

Our team endorses the use of natural grass whenever possible due to its environmental benefits. But to be successful, the “right grass” needs to be used in the “right place”. We can be an asset in this education and would be happy to come out to your offices or virtually host a “lunch and learn” seminar to discuss the different factors that go into finding the right grass. We will share with you both knowledge and widely adopted strategies that can be helpful in your future projects. Also, as part of our “lunch and learn” we will assign one of our team members at Sod Solutions Pro to be your personal consultant for any future grass questions you may encounter during upcoming projects. Always feel free to reach out to them.



WHAT'S INCLUDED

- 1–2 hour webinar on various grass specific topics
- The benefits of grass and how to select the right grass for the right application
- The options of different grasses such as commodity vs. proprietary grasses
- Grass Growing Zone Map - where grasses can grow

KEY BENEFITS

- Keep you and your colleagues up to date on the latest from the turfgrass industry
- Understand trends and what to look for when specifying a grass
- Make sure you get the right grass for the right application

SodSolutionsPro.com/Lunch-and-Learn

Request a Free Quote

The Sod Solutions Professionals team delivers sod and installation services for commercial landscape projects, golf courses, sports fields and housing developments across the globe. Our team can help you select the right products and methods for your project, coordinate delivery and logistics and offer financing options. Our deep industry experience and network of farms and installers ensure that your project is done right the first time with the highest level of quality and service.

SodSolutionsPro.com/Quote-Request

Golf Grasses

From the tee box to the green, Sod Solutions Pro turfgrass varieties cover courses around the world; grasses developed to play at a championship level.



Developed in Australia in the 1990s, Celebration has become one of golf's premiere grasses worldwide. Celebration's pedigree features a two-decade proven track record of success. Its strengths are highlighted in its exceptional root system and rapid recovery time. Celebration has the best documented shade tolerance for a bermuda variety and features a unique, dark blue-green color.



Developed for its cold tolerance by breeders at Oklahoma State University, Latitude 36 is one of the most striking bermudagrasses on the planet. Latitude 36 has a very fine texture and outstanding quality making it a favorite for golfers for ball roll and overall playability. Latitude 36 is found on courses from South Florida to the upper reaches of the transition zone.



Released in 2011, NorthBridge is a tough bermudagrass cultivar known for its cold tolerance and especially its early spring green-up. Its tensile strength and aggressive rooting make it a durable choice for golf courses where rapid damage recovery is important. NorthBridge exhibits a tight, fine-textured appearance and dark green color. Like Latitude 36, NorthBridge will also grow upwards into the transition zone.



Known for its cold tolerance, Innovation Zoysia is a finer bladed zoysia variety that is quick to recover from damage. Innovation was developed to challenge the upper regions of zoysia adaptability to cold temperatures while maintaining exceptional quality and appearance. Innovation is resistant to the bluegrass billbug and is dark green in color.



A staple of the commercial and golf world since the early 2000s, EMPIRE Zoysia has set the standard for a course bladed zoysia variety for golf courses. EMPIRE can be cut down at fairway and tee box heights, but used at taller heights in the roughs to create beautiful, yet challenging links. EMPIRE features drought and heat tolerance that make it a perfect fit for the southern U.S.



If you need a grass for a putting surface, Sunday fits the bill with some of the best genetic stability on the market, meaning that genetic grass mutations won't happen. Getting a consistent look and roll on a green is key and Sunday has proven stable for over 30 years. Its root density and length are hallmark features allowing this grass to survive some low temperatures. Sunday is an ultra-dwarf variety, but can be managed like a dwarf bermuda, which allows for use from low to high end facilities. It can be cut and maintained as low as .080 inches to deliver quick speeds on a stimp meter.

Sports Grasses

Fields around the country and across the globe have used Sod Solutions Pro grass brands to cover championship events for the past three decades. Exceptional surfaces, impeccable performance and a beautiful appearance elevate our grasses to the forefront of any sports discussion, from the smallest fields to the largest stadiums.



Aussie origins explain why Celebration is one of the toughest bermudagrasses on the market today for sports. Celebration features some of the most rapid recovery on the market today. It also has the highest level of shade tolerance for a bermuda variety, which makes play possible with shade from stadium overhangs. Celebration features an exceptional root system and a unique dark, blue-green color. Celebration has been featured in the Olympics and on fields of the World Cup.



A favorite of college stadiums across the U.S., Latitude 36 was developed for its cold tolerance and texture. Its fine, compact growth habit makes Latitude 36 one of the most striking bermudagrass varieties in the world, both from the field level and in the stands. Latitude 36 is found on fields from balmy South Florida to Pennsylvania and everywhere in-between.



Longer green seasons were in mind when NorthBridge Bermudagrass was released in 2011 by Oklahoma State University. NorthBridge cuts down on overseeding needs thanks to an early spring green-up. But its cold tolerance is only one trait that has made this popular in professional sports stadiums. The tensile strength and aggressive rooting make NorthBridge a durable choice for football or horse racing, where rapid damage recovery is important. NorthBridge exhibits a tight, fine-textured appearance and dark green color.



Commercial and Residential Grasses

For almost three decades, Sod Solutions Pro has focused on research and development of superior turfgrasses for commercial, residential, golf and sports uses. We have found that putting the right grass in the right landscape is the most important factor in its long-term success. Our varieties were developed to solve the needs of end-users across the spectrum.



Palmetto is the most sold patented turfgrass in the world with more than two billion sq. ft. sold. Selected for better color and finer texture, Palmetto demonstrates superior shade, cold, frost, heat and drought tolerance.



CitraBlue, the newest grass from the University of Florida was developed to solve lawn disease issues and to be a dramatic improvement over Florida's most common grass, Floratam St. Augustine. Not only is its disease resistance improved, but it also may be one of the top grasses for shady landscapes and it features a distinct blue color.



Celebration is a deep blue-green turfgrass that has finished best in numerous university research studies for wear tolerance and recovery, drought resistance and tolerance and bermudagrass shade tolerance.



Latitude 36 was developed to stretch the limits of bermudagrass adaptability in the North and is a top quality rated bermudagrass nationally. Latitude 36 shows resistance to spring dead spot and is one of the most cold-hardy bermudagrasses on the market.



NorthBridge is tough. Its tensile and root strength can handle heavy amounts of traffic and recover from damage quickly. NorthBridge features outstanding cold tolerance and early spring green-up. It is fine textured and dark green in color.



EMPIRE is a revolutionary medium-bladed, dark green zoysiagrass. It features excellent wear tolerance, requires less mowing and chemical applications and is chinch bug resistant. EMPIRE truly is "The Proven Zoysia®".



Innovation is a versatile zoysia. Developed by researchers at Kansas State and Texas A&M University, Innovation is very cold tolerant. It is a finer bladed zoysia and is incredibly soft. This grass is suitable for the southern two-thirds of the United States.