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Seeding new and improved Kentucky bluegrass cultivars into bermudagrass fairways produces a powerful combination that can thrive in the transition zone.

BLUEMUDA: A MARRIAGE BETWEEN KENTUCKY BLUEGRASS AND BERMUDAGRASS

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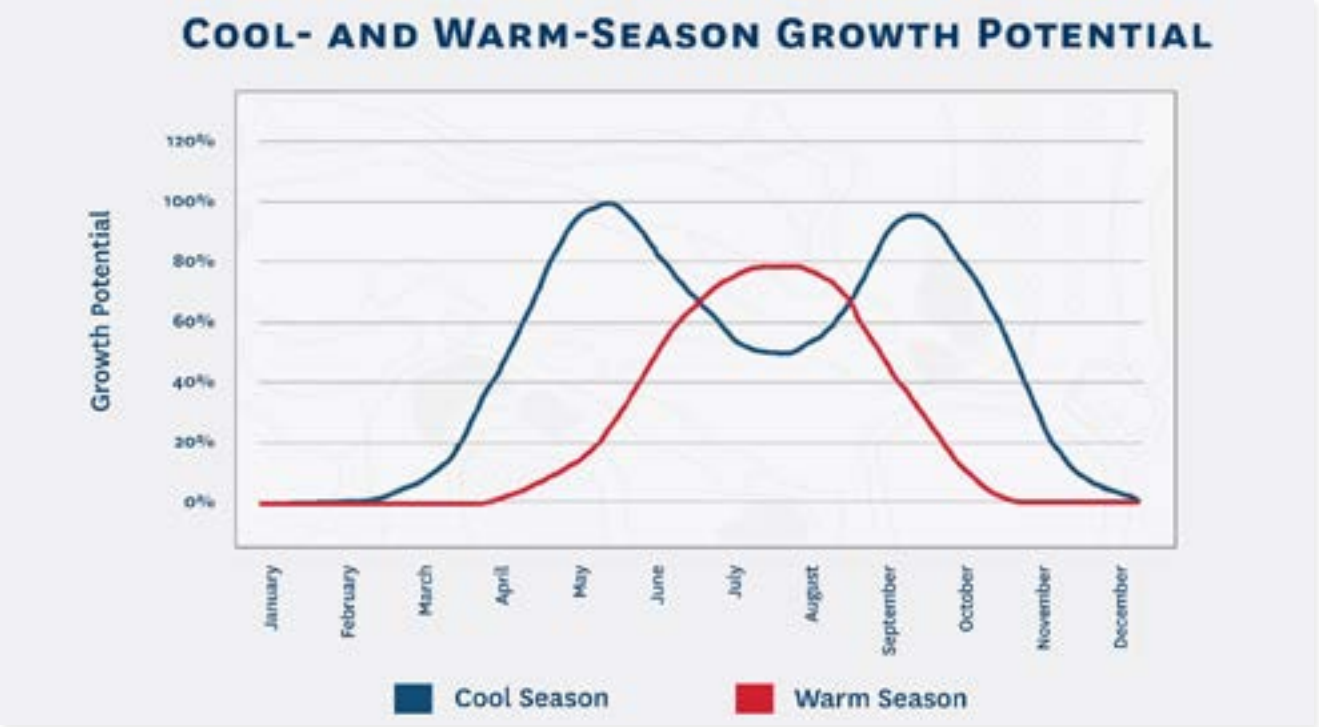
Key Takeaways:

- Bluemuda is a grassing scheme designed to leverage the strengths of Kentucky bluegrass and bermudagrass. It has shown promise in the transition zone, an area of the country where both cool- and warm-season grasses routinely struggle at different points of the year.
- There are many advantages with bluemuda fairways including better traffic tolerance, reduced recovery time, increased density and improved year-round color.
- Not all Kentucky bluegrass cultivars are well-suited for bluemuda. Use of the 'Midnight' types of Kentucky bluegrass can result in an inconsistent surface.
- Unlike overseeding with ryegrass, converting to bluemuda only requires an initial grow-in and there is no transition period in the spring. Both Kentucky bluegrass and bermudagrass are able to coexist together with a good agronomic program.

Bluemuda, a mixed turf stand comprised of Kentucky bluegrass and bermudagrass (not to be confused with 'Blue-Muda' the seeded bermudagrass cultivar that was featured in the 1997 National Bermudagrass Test) is gaining popularity across the transition zone. Turf managers are quickly realizing the benefits of combining these cool- and warm-season turfgrass species as part of a two-grass system that can provide a better-quality playing surface throughout the year in an area of the country that experiences freezing winters and hot, humid summers.

Late fall, winter and particularly early spring playing conditions on dormant bermudagrass fairways is often less than ideal in the transition zone. The turf canopy can be quickly decimated by repeated traffic, leaving players with few leaf blades to support their golf ball and extremely tight lies. For many golf courses, it is a constant battle to prevent high-traffic areas from thinning out each spring. Once areas become damaged, turf managers are left waiting until temperatures finally reach 85 degrees Fahrenheit and significant bermudagrass recovery occurs. This means that in the northernmost parts of the country where bermudagrass is grown, many golfers could be left with suboptimal playing conditions for weeks, if not months, each spring.

Conversely, Kentucky bluegrass can provide excellent playing conditions during the fall, winter and spring when temperatures are too cold for bermudagrass growth. It is also able to provide a consistent green color that is preferred by most golfers. The problems for Kentucky bluegrass come during the summer months when high temperatures and humidity cause significant plant stress, troublesome disease issues and little-to-no recuperative ability.



The growth potential of Kentucky bluegrass (blue) and bermudagrass (red) for Louisville, Kentucky. In the spring and fall when bermudagrass growth is meager, Kentucky bluegrass is thriving. But in the summer when Kentucky bluegrass is sluggish, bermudagrass can flourish. The end result is a much wider window of sustained turf growth and recovery.

Benefits of Bluemuda

Environmental challenges and turfgrass species limitations led sports field managers (Winka 2016) and golf course superintendents (Nicoludis 2019) alike to adopt a two-grass system. Of course, using both cool- and warm-season species together is not a new phenomenon. Overseeding bermudagrass with perennial ryegrass is common in the professional sports field world and on southern golf courses where a desired appearance and active turf growth is necessary to recover from traffic and divots.

But this temporary improvement comes at a cost. Overseeding is a yearly practice that requires substantial resources and disrupts play. Furthermore, persistent overseeding has negative impacts on the underlying bermudagrass, which is typically needed as the primary playing surface during the warmer part of the year.

The bluemuda concept, on the other hand, is long-lived and only requires an initial establishment period. It lacks the bumpy transition period and shouldn't require annual seeding each fall. The goal with bluemuda is to maintain both grasses throughout the entire year. With bluemuda fairways, a golf course can have improved year-round playing conditions, color enhancement, greater traffic tolerance, reduced risk for bermudagrass winter injury and less weed competition – all without the added costs associated with a traditional ryegrass overseed program.

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Getting Started

It doesn't matter if you have a modern bermudagrass cultivar like 'Latitude 36', a dated cultivar like 'Quickstand', or just plain old common bermudagrass. It seems any bermudagrass can work under a bluemuda setup. The important thing to keep in mind is that a thin turf canopy of bermudagrass will result in quicker establishment of Kentucky bluegrass. Yet, that's not to say a dense bermudagrass stand will not work, it's just that the amount of Kentucky bluegrass will likely be less concentrated. In the end, that shouldn't be much of a concern because a dense bermudagrass base should be better able to provide a good winter playing surface.

When it comes to selecting a suitable Kentucky bluegrass for bluemuda fairways, the question isn't which one but instead which ones. Most turf managers have found success using a blend of three to five cultivars. Popular blends include 'Turf Blue HGT' from Barenbrug, '365ss' from Mountain View Seeds, and others that can tolerate a low mowing height, have good summer patch resistance, strong traffic tolerance and the ability to germinate quickly. If you prefer to create your own blend the 'Compact America', 'Eurasian', 'Julia' and 'Shamrock' types or families of Kentucky bluegrass all seemed to work well in University of Kentucky bluemuda field trials (Munshaw 2019). Avoid the 'Midnight' types as they seem to segregate and result in dark, uneven clumps within the bermudagrass.

Fraze mowing is a great way to remove excess thatch and create a suitable seedbed for Kentucky bluegrass establishment.

Kentucky bluegrass seeding rates of 2 to 3 pounds per 1,000 square feet seem to work well. As with any seeding, good seed-to-soil contact will provide the best results. Slit or spike seeders are preferred for planting, but if one of those units are not available a drop seeder can also work if you follow with dragging in multiple directions. It is important to make sure the area you will be seeding does not have any lingering herbicide that could inhibit seed germination. Long-lasting preemergence herbicides, such as indaziflam, can persist for 10 to 12 months, and could prevent the establishment of new Kentucky bluegrass seedlings.

Ideally, Kentucky bluegrass seeding should occur in the late summer or early fall when air temperatures are consistently between 59 and 86 degrees Fahrenheit (Beard, 1973). Prior to seeding, loosen the existing bermudagrass canopy by verticutting. Excessive thatch will hinder germination. Some turf managers have also found success fraze mowing prior to seeding. Applying a plant growth regulator, such as trinexapac-ethyl, prior to seeding could also prove beneficial by slowing bermudagrass regeneration and allowing the Kentucky bluegrass more time to develop under less competition.

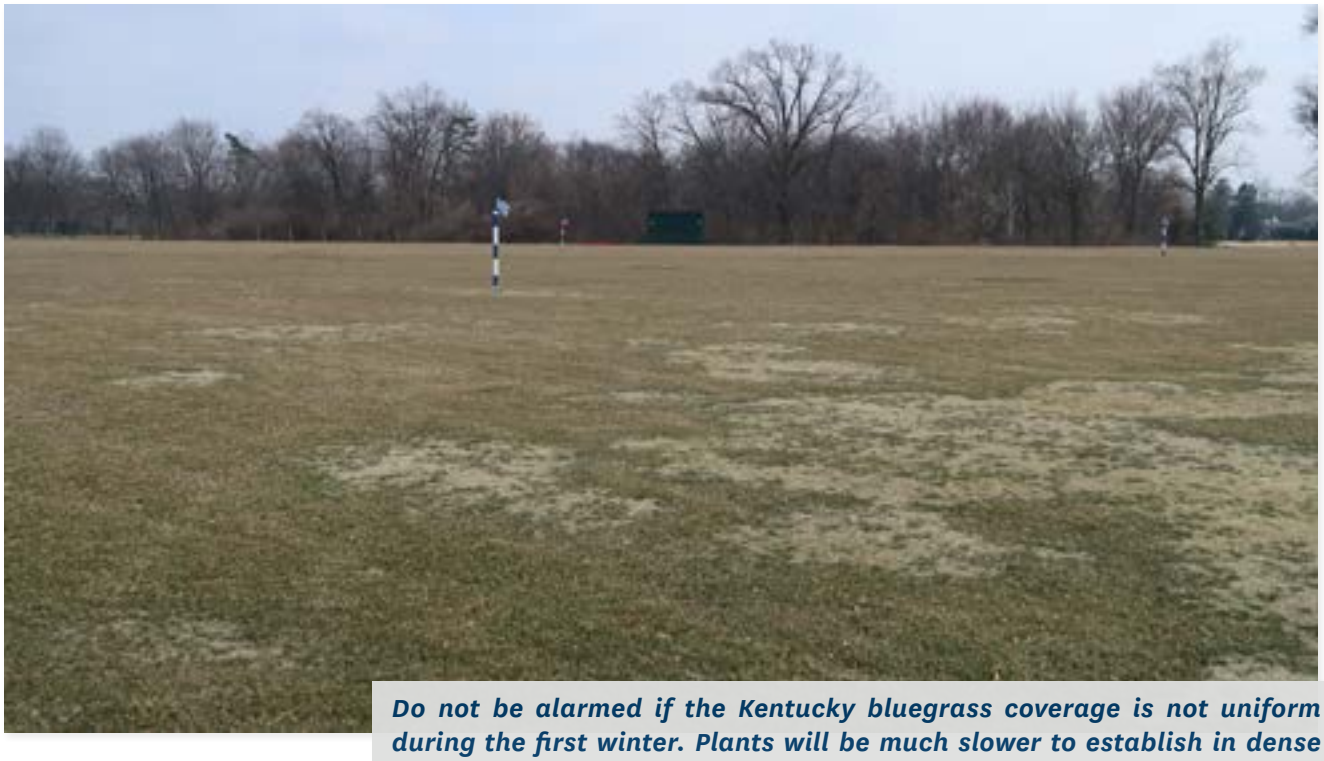
A slit seeder is ideal for incorporating Kentucky bluegrass seed within the existing bermudagrass canopy.

Depending on weather and the exact cultivars used, one can expect to start to see some germination within one week of planting. Even though many of these new and improved cultivars are able to germinate quickly, it is important to realize that the entire process from planting to full Kentucky bluegrass turf coverage will be much slower than overseeding with ryegrass. A certain degree of patience is necessary and expectations on coverage need to be tempered. The amount of Kentucky bluegrass that is noticeable in the fall will likely not reach 100% of what was seeded. It won't be until the spring that things look noticeably better and the full potential will be apparent during the following fall.

Minimizing the amount of traffic new seedlings receive will aid in establishment. At minimum, golf carts should be restricted for the first three weeks immediately after planting and ideally through the entire fall. The fairways need to be kept moist to encourage germination and frequent irrigation needs to occur until the first mowing. However, the golf course does not have to be closed to play.

Golfers could still walk onto the fairways, hit a shot, and walk back to their golf cart parked in the rough, or better yet on the cart path. If fraze mowing is conducting as part of the process, things can be a little muddy for a while so even walking on the fairways might not be sensible.

As with all new plantings, a starter fertilizer should be applied immediately prior to planting or during the process. A complete fertilizer, such as an 18-24-12, that has some slow-release nitrogen will result in consistent turf growth during establishment. Applying at a rate of 1 pound of P2O5 per 1,000 square feet is suggested. A slow-release starter fertilizer will typically cost between $170 to $250 per acre. Seed costs are going to be around $525 to $785 per acre depending on which blend is used and at what rate. Therefore, the total material cost to convert bermudagrass fairways to bluemuda could be as low as $695 per acre.



Do not be alarmed if the Kentucky bluegrass coverage is not uniform during the first winter. Plants will be much slower to establish in dense pockets of bermudagrass.

Mature bluemuda does an exceptional job at crowding out weeds. Note the difference in the amount of Poa annua (lighter green color) in the bluemuda turf on the right, which is less than one year old, compared to the area on the left that is approximately two years old bluemuda.

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Management

Subsequent applications of nitrogen during the first fall can help to speed establishment. Applying urea – i.e., 46-0-0 – at a total rate of 1 to 1.5 pounds per 1,000 square feet spread out over several weeks is worthwhile in situations where getting to a complete green sward as soon as possible is of the utmost importance. With that said, you do not have to fertilize after the initial starter application until the following year, when turf growth resumes in spring. For annual maintenance, nitrogen should be applied in the range of 2 to 3 pounds per 1,000 square feet. Using primarily slow-release nitrogen sources can help to avoid flushes of growth. The turf should be fed consistently from spring through fall so one species is not favored. Applying fertilizers in spring and fall only could hurt the bermudagrass whereas a summer-only schedule would put the Kentucky bluegrass at a disadvantage.

Height of cut will also impact the amount of fertility that is required to maintain healthy turf. Lower heights will necessitate more fertility inputs. The lowest recommended height of cut is 0.5 inch, though many superintendents with bluemuda seem to prefer a slightly higher cut of 0.75 to 0.875 inch. This range seems to provide the most favorable lie in bluemuda fairways and the turf is better able to withstand environmental stresses.

Watering practices will need to be adjusted when going from a pure stand of bermudagrass to bluemuda. The Kentucky bluegrass will likely require some added irrigation during the heat of the summer, so be on the lookout for wilting. However, the total amount of additional water should not be overwhelming as the new cultivars are quite drought tolerant.

Regular cultural practices like aeration and verticutting should occur when both grasses are growing. Late spring is the best timeframe to complete such tasks. Don't be too aggressive if the forecast calls for high temperatures as you do not want to cause significant injury to the bluegrass. Waiting until fall to complete such work is less than optimal as this timing could limit bermudagrass recovery prior to winter dormancy. Therefore, a mid-to-late May window is advised.

Plant growth regulators like trinexapac-ethyl can be safely applied to bluemuda. A rate of 9 fluid ounces per acre on four-week intervals is appropriate. Yet, under most scenarios plant growth regulators are not needed as bluemuda offers good quality without them. These products will probably only be useful when trying to keep the turf at the lowest height of 0.5 inch.

Although having to manage both cool- and warm-season turf within the same stand might seem like a challenge for herbicide selection, it is not of great concern as weed development is typically minimal with bluemuda. Some amount of *Poa annua* can be expected during the initial establishment period but it should wither away during the summer heat and not be a repeat issue. Once the bluemuda has matured, its density seems to do a good job at preventing future weed infestations.

The bermudagrass driving range and polo field at St. Louis Country Club experienced significant winter damage in 2017. The field was converted to "bluemuda" and since then winter damage has been nonexistent and the turf is better able to withstand range picking and horse traffic.

If you do find it necessary to utilize herbicides, a formulation of prodiamine for preemergence and Trimec Southern – i.e., dicamba + MCPP + 2,4-D – for postemergence broadleaf weed control are good options. Just be cognizant of the different rate thresholds for both bermudagrass and Kentucky bluegrass as they will vary on the label. Go with a rate that is within the acceptable range for both species to prevent unintended turf injury.

Another anecdotal benefit of bluemuda is that disease damage seems to be less prevalent. Summer patch is by far the most troublesome disease for Kentucky bluegrass fairways and many golf superintendents routinely apply a preventative fungicide treatment to protect plants. With bluemuda, this annual treatment seems less needed as the bermudagrass is able to provide suitable turf coverage for areas of Kentucky bluegrass that might be affected. Similarly, during the winter Kentucky bluegrass can offer turf coverage for bermudagrass that is suffering from spring dead spot. While these perceived benefits need further research, there are plenty of success stories where golf courses have reduced or eliminated their reliance on fungicides by going to the mixed stand.

Finally, it is not unusual for one species to be more visible at a given point in the year. During the summer one should expect to see more bermudagrass than Kentucky bluegrass. The reverse should be true during the spring and fall. Although the population can be dynamic, both species should be present and able to coexist under good watering, fertility and mowing regimes. As with any marriage, it is important to keep both parties happy.

Is bluemuda right for your course? Through our Course Consulting Service, a USGA agronomist can work with you to determine the return on invest of converting your fairways to bluemuda and provide tailored recommendations for establishment and management at your facility.

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