

Advice for converting from cool-season grass to bermudagrass



» EMERGING bermudagrass seedling.

THERE IS NO MAGIC, "PERFECT" GRASS. Each species has its own limitations and there will be times that even a vigorous grass will not be ideal. For example, even the most cold-tolerant bermudagrass may experience winter-kill. This could be due to being too much traffic when not actively growing. Additionally bermudagrass planted in low-lying, poorly drained areas, mowing too close and other factors may cause poor performance. Furthermore, competition from species like perennial ryegrass that may have been overseeded for winter color will limit future bermudagrass persistence.

The advantage to bermudagrass, however, is that under ideal conditions it will establish and spread much more quickly than cool-season grasses when seeded. Additionally, a mature bermudagrass plant forms a dense network of rhizomes and stolons that is conducive to a stable, high quality playing surface. Turfgrass scientists will continue to work for developing improved cultivars with better leaf texture, growth habit, etc. How they are implemented is up to you, the end user. We scientists are not only interested in the genetic potential of these grasses but also the potential management questions/challenges. Communicate regularly with your local turfgrass specialists as we learn as much from you as hopefully you do from us. -Cale Bigelow, PhD.

Grass illustration courtesy of istockphoto.com

THROUGHOUT MUCH OF THE COOL-HUMID REGION the primary turfgrass species used for athletic fields are Kentucky bluegrass, perennial ryegrass, turf-type tall fescue or a mixture containing combinations of all three. While these cool-season grasses are originally planted, regular re-seeding due to traffic occurs; sports turf managers normally use perennial ryegrass or 50:50 ryegrass:bluegrass mixture.

Inevitably the composition of these fields shifts to ryegrass. While ryegrass is very popular turfgrass species its biggest drawback is summer performance, and susceptibility to potentially devastating fungal diseases. Where severe stand damage occurs this will require re-planting before or during late-summer/fall use period. Poor stand density can lead to potentially unsafe field conditions. Many of these summer diseases can be effectively controlled with fungicide applications; however, access to appropriate spraying equipment, cost, and the potential for unwanted pesticide exposure to users often prohibits these products from being applied.

Today all turf and facility managers are carefully reviewing their programs and systems to potentially reduce maintenance inputs and save money. For sports that demand a smooth, closely mowed turf canopy it is not uncommon to consider bermudagrass. In fact, bermudagrass may be less costly to maintain than many of the cool-season grasses. It is a durable, fast growing warm-season turfgrass. In terms of recovery from traffic it is difficult to find a species that is more aggressive during its active growth period (e.g. summer).

Additionally, it is less disease susceptible and less sensitive to post-emergent herbicide applications for annual grassy weeds like crabgrass, etc. Furthermore, since bermudagrass is a warm-season species it has much higher water use efficiency compared to cool-season grasses. In practical terms, this means that bermuda may require or be more tolerant of less than ideal (e.g. non-uniform) irrigation coverage.

Brown in winter

Probably the biggest negative to using bermudagrass on fields would be the straw-brown color associated with the winter dormancy period. This can be overcome by a proper overseeding program but that is a whole other topic in itself. Additionally, it is important to remember that bermudagrass areas that are used excessively during their winter dormancy period will likely be subject to death and require replanting. Therefore, bermudagrass is not generally recommended for fields that receive substantial early spring use.



➤ Above: **REMOVING** competition before seeding.
 ➤ Right: **CONTRAST** between perennial ryegrass, left, and bermudagrass, right.



Choosing a bermudagrass cultivar:

This is not an easy decision. Before planting bermudagrass you should visit with some managers who regularly cultivate bermudagrass and see their fields. Then I suggest you contact your local land-grant University. They will have the most current information regarding suitable bermudagrass cultivars for your region.

The other item you need to consider is what planting method you will use. Will you sod, sprig or seed? Traditionally bermudagrass was planted using vegetative methods. This is more expensive than seed; however, a lot of work has gone into improving seeded warm-season cultivars. Over the past 10 years a great deal of progress has been made in improving the appearance, growth habit, greenness, and cold temperature hardiness. For most situations seeding is the most economical decision and thus, the improved seeded cultivars are planted.

In the upper cool-humid region (transition zone and further north), winter hardiness is a primary consideration and for seeded bermudagrasses the gold-standard has been Riviera. While there are other cultivars that are equally cold hardy like Yukon, Riviera is most widely planted. Other factors may include seed availability (this has periodically been an issue), and cost.

Establishment process

The first step in renovating any existing turf area is to remove or dramatically reduce competition from any existing undesirable plants. Traditionally, this involves applying a non-selective herbicide containing the chemical glyphosate. In many situations more than a single application will be required to completely eliminate well established vegetation.

Are there other, less aggressive strategies? Attempts have been made to “passively” introduce plant material by applying plant growth regulators (PGRs) like trinexapac-ethyl instead of a non-selective herbicide to slow the growth of existing plants rather than

killing them. Generally, these practices have not been very successful in the long-term. Plain and simple, the existing plant rebounds quickly once the PGR wears off, and the newly planted seedlings are crowded out by the more mature existing plants. Remember that all plants are competing for sunlight, water, fertilizer/nutrients and the space to grow and thrive. The bigger plants normally will win!

Passive systems that involve banding herbicides in narrow (1-3 inch wide) localized areas and directly seeding or sprigging into these areas have had some success. The concept is that the bands are less visually disturbing compared to a completely brown, dead field. The next point in this process is to get the new plants established, then adjusting maintenance practices to favor the bermudagrass as opposed to the cool-season grass. This may involve adjusting irrigation schedules, mowing heights (e.g. lower than 1 inch will favor the bermudagrass), summer nitrogen (N) fertility (e.g. more summer

N will stimulate the bermudagrass), and possibly not treating for fungal diseases during the summer months. Anything that favors the bermudagrass will promote its growth and spread.

The key here is that these practices can only be conducted on “established” bermudagrass. It is unrealistic to adjust these practices immediately, especially for seeded cultivars. Once established, however, taking advantage of the aggressive spreading growth habit during June through August may pay dividends in terms of field coverage. In all practicality, this may not be realized until Year 2 of the establishment process.

Researchers in Kansas found that this practice resulted in approximately 55% cover in Year 1 and nearly 90% coverage in Year 2.

Timing: In general when planting seeded bermudagrasses it is best to start as early as possible. For the transition zone and more Northern locations the ideal window is May 1 through mid-July. For later dates, the plants may not mature as quickly since temperatures begin to drop and day length continues to decrease. Thus, you can still seed but you may need to realize there may be some winter mortality.

Some managers may consider covering the fields to decrease the risk for winter damage on underdeveloped plants. The upside to these late seedings is that there may be hope with the practice of dormant seeding. In other words, seed while the turf is dormant in late-winter/early spring. Research conducted at the University of Arkansas reported that seeding even in the late-winter months was successful the following year. The benefit to this method is that ground tends to be moist and will promote germination. Subsequent plant development would occur as soon as the environmental temperatures were favorable. The downside is that there may be some issues with plant mortality if the field is inappropriately used at this

time or moisture cannot be supplied due to a dry period when irrigation is simply not available.

Seeding rates: Historically, seeded bermudagrasses were suggested to be planted at approximately 2.0 pounds of pure live seed (PLS) per 1000 sq.ft. Recent research, however, has suggested that much lower rates can and should be used. These range from 0.25-1.0 pound PLS per 1000 sq.ft. Certainly higher seeding rates usually result in more rapid leaf coverage, and higher shoot density, at least initially. The reality, however, is the plants are simply not very mature, which may translate to more shallow root systems and fewer rhizomes and stolons being produced. Therefore, the current recommendation for normal situations is that seeded bermudagrass be planted at 0.5-1.0 pound PLS per 1000 sq.ft.

The concept of “PLS” may seem trivial, however, there has been a great deal of confusion in the industry. Several cultivars are sold as “coated seed” which are often a combination of colorants, fungicides or other materials designed to improve the planting and establishment process. These coatings decrease PLS on a bulk seed basis and decrease the number of pure live seeds per pound and that decreases the seed purity value (note: because they have a lower “purity” value this does not mean they are all of low quality).

Take home point: pay attention to the seed label for each cultivar and make a quick calculation. Pure live seed by definition is the product of multiplying the percentage purity times the germination percentage. For example 50% purity x 80% germination = 40% PLS. Generally, the weight of seed required to supply 1.0 pound of PLS is about 10% more in uncoated bermudagrass seed and about 100-125 % more in coated seeded bermudagrasses, meaning you may need to apply approximately 2 pounds of actual seed from the container to achieve a 1.0 PLS seeding rate. Check this before you plant to ensure you are not underplanting the seed and reducing your potential for success.

Germination times: Several of the newer seeded bermudagrass cultivars are rather slow to germinate. Riviera may take 14 days even under ideal conditions. We all have difficulty being patient but this germination process is extremely difficult to speed up. Certain cultivars of seed simply possess more waxy coatings. These coatings presumably slow water uptake and the enzymatic processes associated with germination. A variety of techniques have been attempted to “pre-soak” or “pre-germinate” seed before planting to speed the establishment process. In many situations this involves the use of a barrel or bucket and the seed is placed in a mesh bag or other container allowing for water absorption. While there have been some successes with these methods, they are often not practically feasible in terms of handling (e.g. the process is messy and determining exactly when to remove the seed can be difficult) large seed quantities. Try to be patient.

Irrigation: Whatever method you choose to establish a new grass, access to adequate irrigation and moisture availability is paramount. Seeds need water to germinate and mature. On sand-based systems that drain readily covering the seed with a germination blanket may be necessary to ensure adequate moisture remains in

close proximity to the seed and seedlings. Keep the seed moist throughout the entire germination period. The surface should be regularly irrigated for at least 2 weeks to keep the surface moist but not wet.

Post-establishment fertility: Seedlings need nutrients to grow and develop. No mineral nutrient has a stronger influence on plant development than nitrogen. The general recommendation for seeded bermudagrass or any new seeding is to proceed with caution. The current recommendations would be to apply 1 pound of actual N from a mixed slow+quick release source (e.g. sulfur-coated urea + urea) at planting then 1 pound of actual N every 28 days until the desired coverage and growth is achieved. There are many ways to achieve this and reduce the rate/interval would also work (e.g. ½ pound every 14 days). Regardless the final application should occur approximately 3-4 weeks before the first hard frost in your area. For nutrients like phosphorus, potassium and micronutrients a soil test before planting will provide site specific information.

Mowing: Ideally bermudagrass should be maintained at 1 inch or less for an athletic field. This will be best achieved by using a reel-type mower. Although they may be more expensive to purchase and maintain the only real way to get a uniform cut is with these mowers. The turf should be mowed once a large portion of the canopy is near the intended maintenance height. Realize there may be some bare areas.

It is important to make sure the area is firm before putting any equipment on the site; thus, reduce irrigation cycles immediately before mowing. Another important consideration would be to remove clippings if possible during the first few mowings. Wet, succulent clippings tend to clump and these clippings may shade the turf resulting in bare areas. Alternatively, try to mow the area when it is dry or break the clumps up with a blower or drag mat if necessary. For all future mowings follow the “one-third rule” and do not let the turf become too tall between mowings to avoid scalping.

Weed control/management: Inevitably some weeds may become problematic during summer establishment. Again, that is another whole article. Grassy weeds like crabgrass, goosegrass and sedge-type weeds are most common. There are many herbicides available for the control of these weeds and you can research to discover what is appropriate and labeled for use in your state.

Traffic management: Regardless of the species planted or planting method, traffic management is essential. Excessively using a newly planted field will certainly result in stand failure. Each field location and situation is different, even from one year to the next. Use your best judgment and restrict use as long as possible to promote turfgrass plant development. This may involve roping/fencing the area off, proper signage to communicate that the area is under renovation, etc. ■

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