

Establishing and Managing Bermudagrasses in the Transition Zone

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Bermudagrasses have been successfully grown on athletic fields and golf courses in the transition zone for many years. Although each year some level of winterkill threat exists, bermudagrass remains an excellent surface for golf and sports. Seeded varieties of bermudagrasses have been the most common choices in Kentucky due to the availability of seed of good varieties as well as the ease of planting seed versus living plant material. There are, however, several outstanding vegetative bermudagrass cultivars that are adapted to the transition zone. Turfgrass quality is important when selecting a variety, but in the transition zone, cold hardiness should trump all other characteristics. The seeded cultivar 'Riviera' has long been the industry standard, bridging turf quality with cold hardiness (Figure 1). However, there are several newer vegetative varieties, including 'Latitude 36,' that appear to be distinct options for the

transition zone. Other seeded and vegetative options exist that can succeed in the transition zone. For further information on varieties, see www.ntep.org.

Establishment

The optimum planting time is mid- to late spring when soil temperatures reach 60 to 70°F. The soil needs to be warm enough to allow for seed germination and growth to occur; however, it is best to not wait until mid- to late summer to plant as the short growing season can result in significant stand losses during the first winter after planting. Another option for planting timing is early spring, prior to the occurrence of optimum soil temperatures. This method is called dormant seeding/sprigging and the objective is to have the seeds in place ready to germinate as soon as temperatures are conducive for growth, therefore potentially allowing for the longest possible growing season. Seed

or sprigs are planted several weeks prior to when bermudagrass begins growing in the transition zone and are in place and ready to grow as soil temperatures increase. With this method, there is not lost growing season due to rain, etc., as the plant material is already in the ground.

A soil test should be taken prior to establishment as any deficiencies or irregularities need to be addressed prior to establishment. If a soil test is not taken, avoid fertilizers containing phosphorus and potassium as many soils may already have adequate levels of these nutrients. Further, avoid applying nitrogen prior to germination as runoff can occur from bare soils. Soil pH should be between 6.0 and 6.5 for optimum growth and nutrient availability. For more information, see *Fertilizing Your Lawn* (AGR 212) and *Liming Kentucky Lawns* (AGR 214).

The greatest chance of success with new plantings is to prepare a conventional seedbed by tilling. Weeds and other grasses can significantly interfere with bermudagrass establishment and should be killed prior to planting. Apply a non-selective herbicide such as glyphosate at least two weeks prior to tilling. Following tilling, allow the seedbed to firm up by irrigation, rain, dragging, or cultipacking. Seed applied at a rate of 1 lb pure live seed/1000 sq ft can then be broadcast over the area in two directions and should be lightly raked, chain dragged, or cultipacked to promote good seed-to-soil contact. Another option for seeding is use of a slit seeder or no-till pasture renovator. Keep in mind that if the existing vegetation is not killed prior to seeding, bermudagrass grow-in will be long and arduous. Use caution with slit seeders not to plant very deep. Bermudagrass seed is very small and should be only incorporated into the top ¼-inch of soil (Figure 2). Core aeration is another possible pre-planting method for



Figure 1. 'Riviera' bermudagrass (left) exhibits acceptable color and texture but may appear thin compared to 'Latitude 36' bermudagrass (right) showing good color, texture, and density. Both varieties have excellent cold tolerance for use in the transition zone.

seeding, although results can be less than optimum due to poor seed to soil contact. Another concern with this method is that small seed such as bermudagrass can fall into aeration holes and be planted too deeply for the seedling to reach the surface before running out of energy. Aerate the area in several directions and break up the cores with a chain drag or mower set low. Broadcast seed and drag again.

If sprigging, the same steps should be taken prior to planting. Many sod producers have sprigging machines that apply a thin layer of stolons and then cut them into the soil for good sprig-to-soil contact. If sprigging by hand or with a manure spreader, it is best to roll and/or topdress stolons with sand/soil following sprigging to improve sprig-to-soil contact. Sprigging rates range from 200 bu/acre on the low side to 600 bu/acre on the high side. In the week following planting, sprigs will often turn brown, even under the best of conditions (Figure 3). This is a normal occurrence; color typically returns to the plants and they resume growth within a week or so.

Many fields in the transition zone may need to be renovated each spring depending on the severity of the winter and the volume of play during the dormancy period (Figure 4). Because each winter we are uncertain of the level of grass loss until spring greenup, it may be best to avoid pre-emergent herbicides and only manage summer annual grassy weeds with post-emergent products. If a pre-emergent is applied after a cold winter, or if the grass was especially torn up the previous fall, it will reduce summer weeds but will also inhibit bermudagrass germination that may need to occur to fill in any thin areas. The same can be said about vegetative bermudagrasses, as pre-emergent herbicides will generally reduce establishment. The exception is oxadiazon. Sprigs can be planted into soil treated with oxadiazon without negatively affecting the plants. Keep in mind that pre-emergent herbicides are just the same as other herbicides when it comes to resistance. If you use the same chemical year in and year out, the chances of building resistance to that chemical will increase.



Figure 2. Coated bermudagrass seed showing its small size.



Figure 3. Sprigs beginning to recover shortly after planting. Sprig color often turns brown after planting before green shoots begin to slowly emerge in the canopy.

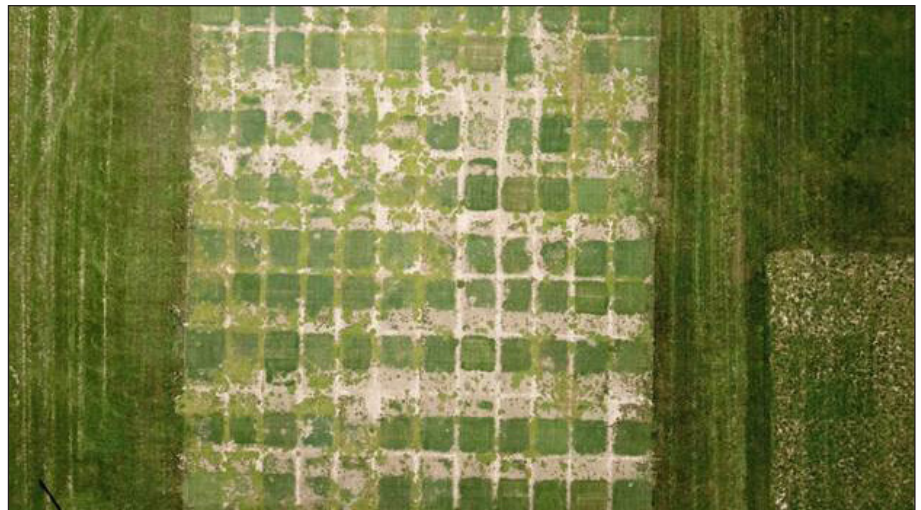


Figure 4. Overhead image of winter-damaged bermudagrass cultivars. This experiment examined the wear tolerance from simulated football traffic on various bermudagrass cultivars. Brown areas in straight lines is the effect on winter survival from fall traffic treatments.



Figure 5. Newly established seeded (left) and vegetative (right) bermudagrass stands that have been treated with herbicides but are still showing weed pressure.

Post-planting Care

Regardless of planting method, seed and sprigs should be kept moist for several weeks. Depending on the seeded cultivar chosen, germination times can vary significantly. Likewise, vegetative varieties can vary in growth rate after planting. Continue keeping soil moist until the surface is covered with seedlings or sprigs have greened up and have rooted into the soil. At this point, begin to back water off. If irrigation is not an option, establishment success will vary greatly due to differences in precipitation.

Once seedlings have emerged from the soil or sprigs have rooted down, ½ lb of nitrogen per 1000 sq ft (25 lb N/A) should be applied and watered in. This method will reduce nitrogen losses from bare soils and give new plantings a boost as they begin to grow. Continue applying nitrogen at the ½-lb rate every two weeks. Once plantings are approximately two months old, begin fertilizing on a normal schedule.

Weed control during establishment can be difficult due to the lack of pre-emergent herbicides that are safe on seeded bermudagrasses. Thus, crabgrass and goosegrass pressure can be severe and will outcompete bermudagrass seedlings (Figure 4). As mentioned above, oxadiazon is a pre-emergent option for vegetative varieties. When treating weeds with post-emergent products, it's important to remember that small weeds are much easier to control than large weeds. During establishment, quinclorac is generally safe to apply on juvenile stands of bermudagrass. Once mature, several options are available for crabgrass and goosegrass control (Table 1).

Always read pesticide labels carefully for safety and use precautions. For more detailed information on weed control, see *Turfgrass Weed Control for Professionals* (AGR-225).

The post-emergent herbicide MSMA very effectively controls crabgrass, goosegrass, and other grassy weeds in seedling and mature bermudagrass turf. However, the use of this product in recent years has become restricted to golf courses

Table 1. Annual grassy weed control options for bermudagrass turf.

Post-Emergent Herbicide	Grass Species Controlled
Quinclorac	Crabgrass
Rimsulfuron	Goosegrass
Sulfentrazone	Goosegrass
Flazasulfuron	Crabgrass
Diclofop	Goosegrass
Foramsulfuron	Goosegrass
Quinclorac + Sulfentrazone	Crabgrass/Goosegrass
Quinclorac + Carfentrazone	Crabgrass
Metribuzin	Goosegrass
Thiencarbazone + Foramsulfuron + Halosulfuron	Goosegrass

Table 2. Example of an annual bermudagrass management program.

Timing	Suggested Product Application	Suggested Management Practices
Jan.-Feb.		Fill low, poorly drained depressions with sandy loam soil, or sand-soil mix. Soil test and include recommendations in annual program.
Feb.	Apply glyphosate for winter weed control if necessary. Be sure that bermudagrass is dormant before applying. Pre-emergent products may be applied between Feb. and Apr. to reduce annual grassy weeds, but only if there is absolutely no threat of winterkill.	
May 1	Apply nitrogen at 0.5 to 1.0 lb N/1000 sq ft (urea (46-0-0) at 22 to 44 lbs N/A - Approx. 50 to 100 lbs urea/A)	Begin mowing at ~1-inch height, 1 to 3 times per week. Mow every 2 to 3 days in hot weather for best quality.
Mid-May		Core aerify on 3-inch centers, 3 inches deep, with ¾ inch tines, then break up and spread cores over surface.
Late-May	Slit seed additional bermudagrass seed or loosen soil and plant sprigs if surface is thin (see above for more information).	Keep surface moist with light irrigation for several weeks until seedlings have emerged.
June 1	Apply nitrogen at 0.5 to 1.0 lb N/1000 sq ft	
Mid-June	Apply grassy weed control herbicide if necessary (see Table 1).	
July 1	Apply urea (see May 1). Apply broad-leaf herbicide if necessary.	
Mid-July		Core aerify as noted above.
Aug. 1	Apply nitrogen at 0.5 to 1.0 lb N/1000 sq ft	
Sept. 1	Apply nitrogen at 0.5 to 1.0 lb N/1000 sq ft	Raise mowing height to 1.5 inches.
Oct. 1	Apply lime and fertilizer according to a current soil test. Applying K in fall can improve cold tolerance, but is not needed if soil test shows adequate K.	Whenever possible, avoid traffic on wet soil and avoid concentrating traffic in the same areas continuously. If soil displacement occurs and turf is worn thin, spring recovery of bermudagrass is sacrificed.

(spot treat only) and sod farms. MSMA is not to be used on sports fields or in residential areas.

What you will often find when establishing seeded bermudagrasses is that the grow-in year can be tough due to weed

competition. However, once you have a handle on weed populations bermudagrass can actually be a fairly weed-resistant surface due to its aggressiveness and density if managed properly with fertilizers.