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Sprigging Bermudagrass

Bermudagrass is a warm season turfgrass commonly used for athletic field surfaces in warmer climates and the transition zone. When deciding which cultivar of bermudagrass to use on your field, one thing to consider is how the cultivar is established. Seeded bermudagrasses can be established from seed, sod, and sprigs (vegetative stems). Vegetative bermudagrasses can be established only from sprigs or sod. Sprigging may be more cost effective than seeding and sodding for some facilities, but maintenance for successful establishment must be taken into consideration.

Sprigging is the process of removing stems (stolons or rhizomes) from mature bermudagrass stands and replanting the vegetative cuttings in a different location. Any grass that has a lateral growth habit can be established by sprigs, but the aggressive growth rate of bermudagrass makes sprigging a very popular way of establishing new fields. Sprigs are typically from 3 to 5 inches long and contain numerous nodes (i.e. growing points) from which new roots and shoots develop. Sprigs are intended to be soil free, thus eliminating any issues with soil layering that sod may present.

Sprigs can be purchased from a commercial company. If purchasing sprigs from a commercial company, be sure the bushels are as per USDA units of measure. Some sod farms measure bushels as a sprig bushel, which is only about half of the USDA volume. Sprigs can also be harvested by you by either aggressive verticutting of an existing, healthy stand or shredding of bermudagrass sod.



Bermudagrass sprigs (Photo courtesy of Van Cline, Ph.D.)



Bermudagrass sprig (Photo courtesy of Van Cline, Ph.D.)

Timing to plant and establish sprigs is highly dependent on the climatic zone in which they will be grown. In general, sprigging in most situations can begin after the last frost of the spring season, but there might be delays in scheduling if the sprig source has not greened and/or the sprig producer cannot access the fields because of weather conditions. The longer a sprig establishment has to mature at a location, the better it will perform as a playing surface. Southern areas may benefit from early to late spring plantings while areas further to the north in the transition zone may need to wait until between late spring and early summer. It is preferable to sprig as early in the bermudagrass season as possible so the stand can be well established to withstand cooler temperatures and traffic in the fall and winter.

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While it is certainly not the norm, dormant sprigging has been employed successfully in some locations, but there is obvious potential that a late spring freeze can injure poorly rooted, actively growing plants. If you are planting during a time when cooler temperatures may present a problem, growth covers may be a solution. Growth covers maintain warm soil surface temperatures for sprigs to grow and can increase establishment rates.

Soilbed Preparation

Make sure the soil on which you are establishing sprigs is healthy and productive by completing a soil test. A soil test will give you information on pH, sufficient nutrients, and deficient nutrients. A soil test will also provide fertilizer recommendations. Eliminate any existing weeds before planting. Using an herbicide (such as glyphosate) for pre-plant, postemergence weed control will not affect establishment. Be sure to follow all label instructions for use. Lightly rotary tilling the field to a depth of 1-2 inches before sprigging can improve sprig to soil contact and enhance establishment rate.

Make sure the soil surface is bare and free of obstructions such as rocks. Complete surface smoothing and grading operations prior to sprig installation. Soil preparation for a traditional sprigging installation will likely not vary much from soil preparation for a seed installation. Another method of vegetative establishment for which sprigs are used is called 'row planting'. For this establishment method, a series of coulters on the planting machine push the sprigs into slits created in an existing sod. The sod has usually been killed with a non-selective herbicide such as glyphosate. Sprigging bermudagrass into existing turf obviously does not establish as quickly as growing sprigs on bare soil. Sprigs established into a prepared soil or a killed sod will typically cover in 5-8 weeks, but athletic field managers and users must understand that a field at 100% cover is not ready for intensive traffic.

Note: Bermudagrass can be sprigged into an existing stand of cool season grass to convert a field from one species to another, i.e. conversion from Kentucky bluegrass to bermudagrass, in a process called 'low impact conversion'. Sprigging bermudagrass into existing turf does not establish as quickly as growing sprigs on bare soil, but the field also does not have to be removed from play except for the initial establishment phase of 10-14 days where frequent watering is required. Depending on the weather of a particular season, this conversion will take at least one summer season and possibly two to effectively convert from a cool season to a bermudagrass turf.

Sprigging

Successful establishment of sprigs is highly dependent on the timing between seedbed preparation, obtaining sprigs, and planting of the sprigs. Once the seedbed is prepared, sprigs can be planted. Whether you are harvesting the sprigs yourself or having them delivered from a sod farm, they ideally should be planted within 24 hours of harvest. If you are purchasing sprigs, be sure they were harvested the same day they are delivered. Plant them on the prepared area immediately. If planting is delayed for some reason, keep the sprigs in a shaded area and periodically 'turn them' in order to try to keep the temperature in the pile from getting so warm that the sprigs will die.

Sprigs can be planted in rows or furrows or by broadcasting them uniformly over the entire planted area. Row sprigging places sprigs 2 or more inches apart in furrows that are 1-2 inches deep. The narrower the spacing between sprigs in the furrow and between furrows, the greater the planting rate. Immediately after planting, sprigs should be tamped or rolled with 1/3 of the sprig remaining above the surface.

Broadcast sprigging scatters the vegetative plant parts uniformly over the soil. The sprigs can then be pressed or cut into the soil at a 1-2 inch depth or lightly topdressed with 1/8-1/4 inch of an appropriate soil material.

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Equipment used to plant sprigs in rows. (Photo courtesy of Van Cline, Ph.D.)

Typically 400-800 bushels of sprigs per acre are planted on a bare soil surface. Higher rates are planted if it is a late planting date, better coverage is desired, or you are sprigging into existing turf. Planting early in the season (early to late spring for warm climates and late spring to early summer for the transition zone) may require fewer bushels because the bermudagrass has more time to establish and provide optimum coverage.

Generally it takes about a week for new growth to emerge. If correct maintenance practices are followed, once bermudagrass starts actively growing, the stand will fill in rapidly.



Newly sprigged field (Photo courtesy of Ken Gregory)

Maintenance Following Sprigging Irrigation

It is essential that sprigs receive adequate water for best results during establishment. Sprigs should be watered within 30 minutes of planting. Irrigate to keep the soil persistently moist during establishment. Sprigs must be watered generously during establishment because limited roots are unable to reach water in the soil profile which makes the plants susceptible to heat and drought. Irrigate several times daily for 7-10 days after planting to keep the area moist. Sprigs may remain brown for 1-2 weeks before green up and growth begins, so don't give up on stand establishment (i.e. irrigation) if the newly planted turf immediately appears 'brown'. An almost complete loss of existing foliage on the sprigs at installation is entirely normal and is something that people unfamiliar with sprig establishments must learn to accept.

Be vigilant of extraneous factors including:

- Wind and other weather conditions – On hot, sunny, and/or windy days, newly sprigged areas may require more water due to greater evapotranspiration rates.
- Distribution of water - Poor distribution or excess water volume in areas can disperse sprigs so coverage is not uniform. Be sure the distribution on sprinklers is uniform, something that should be checked BEFORE planting.
- Irrigation cycles - Make sure irrigation cycles are frequent enough that the sprigged areas do not dry out. Also make sure the irrigation cycles don't over saturate the area. Excess water can lead to disease or literal drowning of the stems. The root system requires oxygen to function too.

Irrigation can be reduced gradually once the plants establish root systems and visible signs of growth (new shoots, creeping stems, etc.) is evident. As sprigs reach 1-2 inches, gradually reduce frequency of irrigation and move towards a maintenance irrigation program of 'deep and infrequent' watering. Well established bermudagrass requires 1-1.5 inches of water per week.

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Irrigating a recently sprigged field (Photo courtesy of Ken Gregory)

Fertilization

Apply a starter fertilizer to enhance growth and development. Research shows that sprigs benefit from complete fertilizer applications. Fertilizers with a ratio of 1:1:1 are typically sufficient as a starter fertilizer and this is one situation where supplemental phosphorus is very important to promote root development. Balanced nitrogen, phosphorus, and potassium during establishment can ensure rapid growth and best rooting.

- Nitrogen is essential during establishment to encourage rapid shoot growth and overcome losses from leaching due to heavy irrigation. However, if nitrogen rates are too high, establishment rates can be reduced.
- Phosphorus is also essential during establishment. Phosphorus deficiencies are often seen due to limited rooting during establishment. Roots must grow to available concentrations of phosphorus in the soil, which is why providing adequate amounts of phosphorus via a starter fertilizer are so important. Excessive phosphorus does not provide any additional benefits once adequate amounts have been applied and is a potential threat to water quality.
- Potassium is also a beneficial nutrient during establishment. High irrigation rates can leach potassium making fertilization important. However, too much potassium can result in a salinity problem.

After the initial starter fertilizer application, sprigs should continue to receive nutrients every 2-4 weeks depending on your soil test and rootzone. Frequent irrigation may leach away needed nitrogen and other nutrients, especially in sand-based root zones. Turf managers have seen success applying nitrogen every 2-4 weeks, rotating between a complete fertilizer and quick release nitrogen source. Native soils may require less nitrogen at application (e.g. 0.5 lb. / 1000 square feet) versus sand based fields (e.g. 1.5 lb. / 1000 square feet). Spoon feeding the sprigs on a frequent basis will keep sprigs aggressively growing and allow for a quicker establishment.

Use your soil test to monitor your soil pH and also determine if additional phosphorus or potassium is needed in later season fertilizer applications. Nitrogen fertilization in most locations should end in September to avoid winter injury.

Herbicides

Before sprigs are established, do not use herbicides that may interfere with growth and development. Refer to herbicide labels for specific instructions on when it is safe to use for weed control. Most common preemergence herbicides are 'mitotic inhibitors' and their modes of action will reduce rooting of the newly established sprigs. Oxadiazon (common trade name of Ronstar) has a different mode of action, and when applied according to label directions, it typically provides exceptional preemergent weed control with no detrimental effects on the established sprigs.

Once the bermudagrass is healthy and actively growing, herbicides may be used to control weeds. Grassy and broadleaf weeds may interfere with bermudagrass establishment and decrease the quality and coverage of the stand. Be sure to refer to herbicide labels for specific instructions for an effective application.

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Mowing

Mowing can begin when sprigs are 1-2 inches tall. Bermudagrass is typically maintained at cutting heights of 0.5 to 1.5 inches for athletic fields. Due to its high growth rate, bermudagrass may require a greater mowing frequency throughout the summer. Remember not to remove more than 1/3 of the leaf blade in a single mowing. If the area is still receiving heavy irrigation, be sure the soil is not saturated before mowing to avoid ruts and scalping.



Field sprigged with bermudagrass (Photo courtesy of Ken Gregory)

Management during the first growing season is crucial for survival and success of bermudagrass sprigs. Depending on soil temperature, moisture, and management, expect a standard bermudagrass sprigging into a prepared soil to cover within 5-8 weeks after sprigging. However, it is critical during this first season to understand that what might be a great looking playing surface actually has very poor traffic tolerance at this time as the turf is far from maturity. Educate end-users in the importance of limiting field use and rotating areas of play as often as possible during this first season. Raise the mowing heights of the turf prior to a killing frost in order to promote winter hardiness. And when possible, refrain from overseeding the bermudagrass with ryegrass in the first season. The competition of the ryegrass in the following spring can significantly reduce the performance potential of what is still a maturing bermudagrass turf early in its second growing season. Careful maintenance on a newly established stand of bermudagrass can lead to a healthy, safe, playable athletic surface.

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