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Bermudagrass for Athletic Fields

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This publication has been prepared for managers of football and soccer fields who are frustrated by trying to grow cool-season grasses where irrigation is limited or where fields receive heavy use during optimal seeding times of the year. Another situation many groundskeepers face is a field that receives heavy use through the summer with no opportunity to recover before the the fall season begins. If you have found yourself in these situations, you may want to consider bermudagrass as a means of establishing a reasonable stand of grass to maintain good playability and safety.

Cool-season grasses are preferred for athletic field turf in Missouri. However, their success is sometimes compromised because of harsh summers, excessive traffic and restricted cultural management practices. The following information is provided as a possible solution to heavily worn athletic fields where cool-season grasses such as Kentucky bluegrass, perennial ryegrass or tall fescue have been tried without success.

Consider the six factors listed below to evaluate efforts to manage cool-season grasses. Drainage, irrigation and traffic control are the most crucial factors in grass survival from year to year, especially on a limited budget. Once the options for maintaining cool-season grasses have been exhausted, bermudagrass may be the choice.

Before changing to bermudagrass, consider the following six factors necessary for growing cool-season grasses on athletic fields in Missouri:

1. Rapid drainage. Playing surfaces should be graded or crowned (1–1.5%) to provide rapid removal of surface water from heavy rains. Fields with reverse crowns (concave) in the center should have soil replaced to reestablish proper grade.

Subsurface drainage also is necessary to prevent anaerobic conditions (lack of air) in the root zone. Even when drainage is adequate for plant growth, turf on soil with a low water infiltration rate may be severely damaged when athletic activities are held during or shortly after heavy rain. Sand or modified soil fields that have infiltration rates between 2 and 4 inches per hour offer the best means of rapidly removing water from the surface and reducing the chance of severe field damage.

2. Irrigation. There is no substitute for adequate irrigation. It should be a high priority in upgrading athletic fields. Irrigation will do more for the potential to establish and keep turf in Missouri than any amount of seed, sod, fertilizer, pesticide, or cultivation.

Table 1. Nitrogen fertilizer recommendations for cool-season grass athletic fields.

Date	Lb N per 1,000 sq. ft.	Comments
Mar. 15 – Apr. 1	1.0	Use a soluble source of nitrogen such as urea (45-0-0) or ammonium sulphate (21-0-0).
May 1–30	1.5	Use a slow release source of nitrogen such as IBDU, SCU, UF.
Sept. – Nov.	3.0	Apply one pound of nitrogen per 1,000 sq. ft. each month from a soluble source of nitrogen.

The best solution is a permanent, and preferably automatic, irrigation system that evenly supplies a minimum of ¼ inch of water every day to each field. Commercial traveling gun sprinklers have been used successfully to irrigate athletic fields. They are portable for multifield use but usually require 8 to 10 hours to irrigate a single field. Home lawn sprinklers, even traveling models, are not adequate for large athletic fields.

3. Traffic control. Assess nontraffic areas of the field, such as beyond the end zone. If the current level of management is providing acceptable turf in the nontraffic areas, change the pattern and amount of traffic, rather than changing the grass species or management practices.

Management of athletic fields requires coordination among administrators, coaches and groundskeepers. Administrators should keep in mind that proper traffic control costs nothing and at the same time offers the most effective means of reducing dangerously worn areas on game and practice fields. The coach must take an active interest in scheduling activities and preventing excessive turf wear. The coach and the grounds superintendent can work together to develop improved grass areas specifically for drills that are conducted off of the game and practice fields.

As much as possible, reserve athletic fields for games only. Hold scrimmages on practice fields. Practice

drills should be held in areas off the game and practice fields, and they should be rotated among those areas to allow for turf recovery.

Band practice on the game field should be limited to once per week and only when the soil is dry enough to resist compaction in marching paths. Yard lines can be painted on parking lots or other turf areas for daily band practice.

4. Spring, summer and fall fertility. Soils should be tested yearly and proper adjustment should be made for pH, phosphorus and potassium. Table 1 represents a good program for scheduling nitrogen application to cool-season grasses. Additional nitrogen may be required on soils amended with sand.

In addition to a general nitrogen schedule, it may be necessary to force growth and recovery of turf in high traffic areas of athletic fields. In these special areas, apply nitrogen each month from March through November, especially on highly leachable, sandy soils. Do not exceed one pound of soluble nitrogen per 1,000 square feet per month. Forcing growth in this manner will require additional irrigation and mowing.

If these basic fertility requirements have not been met, cool-season grasses have not been given a fair chance to grow.

5. Cultivation. Core cultivation needs to be a regular practice for any athletic field program. In areas receiving little traffic core cultivation may only be needed once or twice during the year to prevent thatch and increase water infiltration. In heavily worn and compacted areas, however, cultivation may be needed on a more regular basis to break up hard ground, allowing for spread of established grasses and establishment of seedling grasses. Few athletic fields exist that would not benefit from core cultivation during certain times of the year.

6. Overseeding. Overseeding to reestablish turf may be necessary where it has been worn to the point that recovery from underground stems and crowns is not possible. Bluegrass/ryegrass fields should be overseeded with a bluegrass/ryegrass mixture or straight perennial ryegrass. Tall fescue/bluegrass fields should be overseeded with a tall fescue/bluegrass mixture or straight tall fescue.

Tall fescue and perennial ryegrass should not be combined in a seed mixture, nor should one be interseeded into an established stand of the other. Fall or early winter dormant seedings of cool-season grasses are preferred to spring seedings.

Sod should also be considered when cool-season grasses are desired but there is not enough time to establish cover from seed during the off season.

The bermudagrass decision

Bermudagrass, a warm-season grass, has advantages and disadvantages. You should know what to expect once you are committed to using it.

Advantages of bermudagrass:

- Can be successfully established or renovated during the summer — May through August — when fields are seldom in use. Late spring and summer seeding of cool-season grass is almost never successful in Missouri. Heavy traffic in the spring and fall may not leave time for cool-season grass establishment from seed.
- Fast-growing grass with aggressive creeping rhizomes and stolons that can spread as much as 3 feet during the summer to cover worn areas and bare soil. Produces a tough, wiry surface that results in good traction.
- Compared to cool-season grasses, it has a much better chance of surviving the summers on low-budget fields with limited irrigation.
- Performance is good to excellent in the southern part of the state (south of Interstate 70) in Missouri, with a greater potential for winterkill in the Kansas City and Lake Ozark regions. Severe winterkill seldom occurs in the southern third of Missouri.
- Excellent choice for practice football fields that generally have limited irrigation and receive most activity early in the season — August through September — when bermudagrass is still growing.
- Can be overseeded with cool-season grasses to improve fall and spring performance. Dormant bermudagrass has good traction and cushion as long as the dormant vegetation is not entirely worn away.
- Can be mixed with perennial ryegrass to improve the success of late spring and summer seedings for repair of cool-season grass athletic fields. Addition of bermudagrass in summer seedings usually ensures green cover and improved field performance during the early part of the fall playing season. This is especially popular where good turf cover during the playing season takes precedence over a uniform green color throughout the growing season.

Disadvantages of bermudagrass:

- Turns brown and goes dormant after the first frost, leaving the field with poor color and poor recovery potential during the last half of the fall season (October-November) and during the entire spring season (March – mid-May).
- Even though bermudagrass tolerates drier conditions and requires less irrigation than cool-season grasses, it still requires some irrigation or timely rains during establishment and for recovery of worn areas.

What to expect from bermudagrass

Bermudagrass is not the answer to all athletic field problems. It should not be viewed as a substitute for irrigation, proper fertility and a regular cultivation program. Winter survivability of bermudagrass in the

lower two-thirds of Missouri is greater than the summer survivability of cool-season turfgrasses grown without irrigation and subjected to the rigors of athletic field use.

Using bermudagrass to repair worn out areas of the field will result in better vegetative cover during more of the playing season. However, the appearance of the field may not be uniform since bermudagrass has a slightly different texture and shade of green. It is brown during the fall and spring and is easily distinguished from weeds and other cool-season grasses.

Fields that are entirely bermudagrass will have a more uniform appearance, but will still have the problem of winter dormancy. Bermudagrass overseeded with Kentucky bluegrass or perennial ryegrass will have the best vegetative cover and appearance during the entire year.

Seed or sprig bermudagrass between early May and mid-July. August seeding or sprigging is not recommended because of insufficient time for proper establishment before cold weather. Bermudagrass will not germinate or grow until soil temperatures have adequately warmed. Seeding or sprigging before May will result in heavy competition from spring weeds.

If an early spring covering is needed, bermudagrass sod can be cut and laid from late March through July. Dormant sod should not be cut and laid on fields where spring games are scheduled. Improved varieties of bermudagrass are now available as seed, sprigs, plugs and sod. Seeding and sprigging are the most common means of establishing bermudagrass (see Table 2).

Seeding, sprigging and plugging

Many improved varieties of bermudagrass are now available as seed. Seeding rates should range from 1 to 2 pounds of seed per 1,000 square feet.

Sprigs are pieces of torn turf usually containing a stolon with roots and up to four nodes. Sprigs can be planted by broadcasting them over loose soil followed by a light disking to partially cover them with soil. A portion of each sprig should remain exposed after planting. Mechanical spriggers are available that slit the soil open, plant the sprig and cover the sprig with a small amount of soil. In either case, the sprig should promote roots and creeping stems from the nodes. Sprigs can be purchased as sod and then shredded, or often can be purchased by the bushel. One square yard of sod makes approximately one bushel of sprigs.

Plugs are usually 1 to 2 inches in diameter with 1 to 2 inches of soil attached. They should be fitted tightly into prepared holes and tamped firmly into place. Plugs are generally placed 6 to 12 inches apart. Closer spacing may be used to hasten cover of the turf area.

Renovating with bermudagrass

Field preparation and establishment:

- Control broadleaved weeds, particularly knotweed and creeping speedwell in April so that broadleaf herbicide applications will not interfere with summer establishment of bermudagrass.
- Immediately after spring field activities, regrade the surface if necessary, fill depressions with soil and smooth the surface.
- Irrigate in late April and early May to germinate as much crabgrass as possible.
- Where no desirable grasses exist, kill all vegetation with glyphosphate and seed or sprig seven to 14 days later. If desirable grasses exist, kill newly emerged crabgrass with MSMA or DSMA and seed or sprig 14 days after application. Killing the first flush of crabgrass before seeding or sprigging bermudagrass reduces crabgrass competition, and the need to control it, the remainder of the year. Bermudagrass establishes much better with less weed competition and if there is no need to apply repeat applications of post-emergence herbicides.
- Loosen hard soils and prepare a seed bed by intensively coring, spiking, or slicing. After seeding lightly, rake or drag the surface to ensure good seed-to-soil contact. If a drill or slit seeder is used, make at least two passes in opposite directions using half the total amount of seed. The remainder of the seed should be broadcast to provide faster and more uniform coverage of bermudagrass.
- Add lime, if needed, and fertilizer. Add one pound of nitrogen, phosphorus (K_2O) and potassium (P_2O_5) per 1,000 square feet per month during the first three months of establishment. Make the lime and first fertilizer applications immediately before preparing the seed bed to improve incorporation into the soil.
- Water frequently to encourage germination and rapid turf coverage.
- Begin mowing at 1.5 inches as soon as the grass is tall enough to be clipped.
- Apply MSMA or DSMA according to label recommendations to control crabgrass that competes with the establishing bermudagrass.

Irrigation

One of the reasons bermudagrass has been recommended is because of its ability to maintain active growth and recovery during typically dry summers in Missouri. However, establishment of bermudagrass is greatly enhanced when some irrigation is provided. Sprigs should not be installed unless they can be kept moist for at least the first three to six weeks after planting. Seeded bermudagrass will not germinate and establish unless rainfall or irrigation keeps the top 1 inch of soil moist for a minimum of two to four weeks. Ideally, temporary or permanent irrigation should be available to supply water daily for the first month after planting and at least twice a week thereafter. During the first three weeks, water shallow and frequently to keep only

Table 2. Bermudagrass varieties for Missouri athletic fields.

Seeded varieties[1]	Comments[3, 4]
Blackjack	Medium leaf texture, good density and recovery, fair cold hardiness.
Common	Coarse leaf texture, good summer color, good cold hardiness after first year.
Guymon	Medium-coarse leaf texture, forage type, good cold hardiness.
Jackpot	Medium leaf texture, good density and recovery, fair cold hardiness.
Mirage	Medium leaf texture, good color, early spring green-up, fair cold hardiness.
Mohawk	Medium-fine leaf texture, dark green color, good cold hardiness.
Princess	Fine leaf texture, dark green color, excellent turf density, good cold hardiness.
Riviera	Medium leaf texture, dark green color, good cold hardiness.
Savannah	Medium leaf texture, dark green color, fair cold hardiness.
Sidney	Medium-fine texture, dark green color, good wear tolerance, fair cold hardiness.
Sultan	Medium-fine texture, dark green color, good density, fair cold hardiness.
Sundevil II	Medium leaf texture, good color and density, fair cold hardiness.
Transcontinental	Medium leaf texture, dark green color, fair cold hardiness.
Vegetative varieties[2]	**Comments**
Midfield	Medium leaf texture, excellent wear tolerance and recovery, fair cold hardiness.
Midiron	Medium leaf texture, slow recovery to wear, good cold hardiness.
Midlawn	Medium leaf texture, slow recovery to wear, good cold hardiness.
Patriot	Medium leaf texture, dark green color, good density, good cold hardiness.
Quickstand	Medium leaf texture, excellent growth and recovery, good cold hardiness.
TifSport (Tift 94)	Medium leaf texture, improved wear tolerance, good cold hardiness.
Tifway (419)	Medium leaf texture, good density and recovery, fair cold hardiness.

Notes:

1 - Seeded varieties are usually planted at a rate of 1 to 2 pounds per 1,000 square feet.

2 - Vegetative varieties are usually sprigged at a rate of 8 to 10 bushels per 1,000 square feet.

3 - Fair cold hardiness implies establishment in the southern third of the state, some winter kill can be expected in severe winter conditions.

4 - Good cold hardiness implies establishment in the southern two-thirds of the state, some winter kill can be expected in severe winter conditions.

the area of actively growing roots moist. As plants begin to tiller and produce deeper roots, irrigate deeper and with less frequency.

Established bermudagrass will usually survive the driest summers in Missouri, however if it has been severely worn and is expected to rejuvenate from rhizomes and spread into bare areas, it will require weekly water from either rain or irrigation.

Weed control

Whether bermudagrass is seeded, sprigged or plugged, crabgrass and nut sedge rapidly establish in bare spots during summer. Preemergent herbicides should not be used on weakened bermudagrass in the spring or summer, or when attempting to establish newly seeded bermudagrass in the summer. Ronstar preemergent herbicide is labeled for the establishment of bermudagrass sprigs. Read the label for proper rates.

Control annual grass weeds and nut sedge with postemergence applications of MSMA or DSMA. Repeat applications, seven to 14 days apart, may be necessary for adequate control. Delay application of MSMA or DSMA until turfgrass rooting has occurred and spreading stolons are visible. Try to time your MSMA application after three or four mowings when warm season grasses are actively growing and crabgrass begins to dominate the turfgrass canopy.

Summary

Cool-season grasses are preferred for athletic fields in Missouri where proper attention is given to turf management and traffic control. Bermudagrass may be the best choice, however, where irrigation is limited and fields receive use through the spring, summer and fall.

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