



Sports Field Maintenance

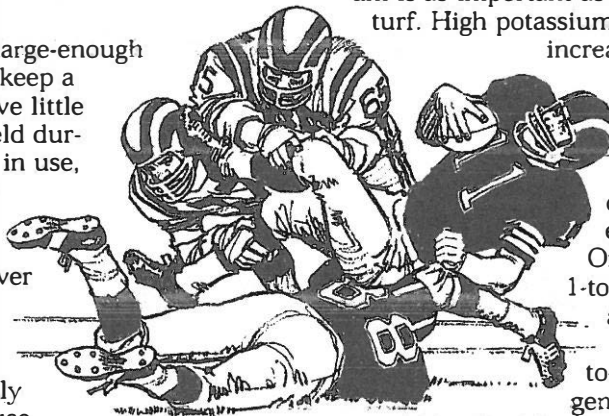
Richard L. Duble*

Coaches are often more concerned with injuries, personnel problems, and opponents than with the condition of the turf on their playing fields. Winning always seems more important than looking good, but it is possible to do both.

A quick look at the growing list of sports field injuries across the country provides further incentive to condition the field as well as the players. From a playing standpoint, a good turf should be resilient, uniform, and wear-resistant. It should be soft enough to prevent abrasions when players fall, yet firm enough to permit good footing.

Surveys conducted by proponents of artificial turf show that as many as half of the serious knee and ankle injuries are related to poor field conditions: hard field surfaces, poor grass cover, rough surfaces, or slick, muddy conditions. Fewer injuries occur on properly conditioned fields. Manufacturers of artificial turf claim that a uniform, consistent artificial playing surface will reduce serious knee and ankle injuries. This may be true, but a properly conditioned natural grass field will reduce knee, ankle, and other injuries as well.

Few school systems have a large-enough staff or an adequate budget to keep a field in top condition. Most have little problem growing grass on a field during the summer when it is not in use, but wear and tear on the grass and soil compaction under playing conditions make it difficult to keep a good turf cover through the playing season. Fields that are mowed regularly, fertilized properly, and watered and aerified on a timely basis will stand up to normal use.



Mow to Increase Turf Density

Bermudagrass responds to close mowing by initiating new shoots and leaves. When mowed at the proper height and frequency, a weak, thin turf can be converted to a much thicker and more wear-resistant turf. Mow common and Texturf-10 bermudagrass sports

fields twice weekly at a height of 1 inch. Mow hybrid bermudagrass such as Tifway every 2 or 3 days at a height of $\frac{1}{2}$ to $\frac{3}{4}$ inch. Bermudagrasses form a thicker and more wear-resistant turf that remains green longer in the fall when mowed frequently at the shorter heights. There is no substitute for close, frequent mowing. A fine sports field requires strict adherence to these recommended mowing practices.

Fertilize to Promote Grass Recovery

Several aspects of fertilization are critical to the development of a healthy turf on a playing field. Nitrogen is required to produce a good turf, but it should be available to the grass at low and uniform rates. A single application of fertilizer should not provide more than 1 pound of soluble nitrogen per 1,000 square feet. On a newly planted field this amount of nitrogen should be applied at 2- to 3-week intervals. For maintenance fertilization, 4- to 6-week intervals are satisfactory.

On a sports field that receives frequent use, potassium is as important as nitrogen to the survival of the turf. High potassium levels in grass tissue greatly increase the wear tolerance of grass.

Apply potassium at about the same rate as nitrogen.

Phosphorus is important during the establishment of turf on a new field and for the recovery of turf worn by game use.

On a new field, a ratio of about 1-to-1 of phosphorus to nitrogen is adequate. Under maintenance conditions, use a 1-to-3 or 1-to-4 ratio of phosphorus to nitrogen. A 3-1-2 or 4-1-3 ratio of N-P-K would be ideal for maintenance of sports fields.

Timing of fertilizer applications is as important to the vigor of the turf as the rate and analysis of the fertilizer applied. Make applications in the early spring and continue until a satisfactory turf cover develops. Apply a complete fertilizer such as 15-5-10 or 16-6-12 in the spring and early summer.

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Avoid mid-summer fertilizer applications unless the grass has not completely covered the field. Excess growth during the summer does not contribute to the durability or the quality of the turf during the playing season; it only increases maintenance requirements. If nitrogen is needed during summer months, rates should not exceed 1 pound of N per 1,000 square feet per month.



Fall applications of fertilizer enhance the color of the turf and promote grass recovery. Although the grass may not appear to respond to late-season fertilization, grass roots do respond. Root growth helps to strengthen the turf. Also, where intense use has thinned the turf, a late-season application of a complete fertilizer will hasten turf recovery. Apply a complete fertilizer in the fall at a rate of 1 pound of nitrogen per 1,000 square feet. Even where the grass appears healthy, late fall fertilization will strengthen the turf. Do not apply high rates of a soluble nitrogen fertilizer in the late fall. Such an application promotes succulent growth and increases the risk of winterkill.

Aerate to Improve the Playing Surface

If the field is hard because of poor soil conditions or heavy use, aeration will help. A hollow-spoon aerator will reduce soil compaction, increase water penetration, and promote grass recovery. Aerate fields when the soil is moist (not wet) for maximum penetration of the spoons. Multiple passes over the field with the aerator increase the effectiveness of aeration. After aeration, drag the field with a heavy mat to break up soil cores and smooth the surface. Aeration can be done in early spring and summer and even during periods when the field is in use.

Water Only When Needed

Wet conditions add to the deterioration of turf on a sports field. Coordinate watering practices with the

scheduled use of the playing field to minimize problems. The surface must be dry when the field is in use. When supplemental watering is required, schedule it at least 24 hours before the field will be used. As water is needed, wet the soil to a depth of 4 to 6 inches on a weekly basis and follow with light watering as necessary. When fields are wet because of rainfall, reschedule the use of the fields when possible to reduce damage to the turf.

Renovate to Keep the Field in Play

If your field resembled a parking lot more than a playing field at the end of last season, renovation is in order. The pride of the school and the community, the performance of the team, and the safety of the players are at stake.

Renovation of extensively used football fields is an annual requirement involving aeration, topdressing, weed control, fertilization, and, in extreme cases, replanting.

The first step in renovation involves correcting the conditions that caused the field to deteriorate. Poor drainage, soil compaction, weeds, excessive use, or lack of a maintenance program can all lead to the deterioration of turf. Renovation followed with a good maintenance program can change a poor field into a well-turfed field in a single season.

A good playing field must be firm, resilient, and uniform from a player's standpoint and attractive from a spectator's standpoint. The physical condition of the soil is as important as the turf to a firm, resilient, and uniform surface. A hard, compacted soil or a wet, poorly drained soil cannot provide a good playing surface, regardless of the amount of grass on the field. With or without good turf, a firm, uniform, and resilient playing surface should be mandatory on all football fields.

Some fields cannot be satisfactorily improved without replacing the soil. Such fields are characterized by:

- Thin turf.
- Very hard surfaces when dry.
- Waterlogged and slick surfaces when wet.
- An excessive number of player injuries.

Short of replacing the existing soil with a good topsoil, providing adequate surface drainage, aeration, and topdressing will improve the physical condition of the field. A football field constructed with a clay or clay loam soil should have an 18-inch crown to provide surface runoff and outlets along the sidelines to remove excess water from the field. Sandy-textured fields can be constructed with as little as a 10-inch crown or a 1-percent slope. If these conditions are not met, improving drainage is the first step in renovation.

Use a soil similar in texture to that on the field to build up the crown. Before adding the topsoil, aerate the field with a coring-type aerator by running the unit over the field in three or four directions. Distribute the required topsoil down the center of the

field and level with a grader. Smooth the final surface with a heavy steel mat or other drag to eliminate any ridges or depressions. If the crown must be raised more than 2 inches, disk the field 4 to 5 inches deep before and after adding the topsoil.

Where perennial weeds (dallisgrass, bahiagrass, and nutgrass) are a problem, eliminate them with selective herbicides before mechanical renovation.

If improved hybrid bermudagrass is to be planted in place of common bermudagrass, or if weeds are so numerous that little desirable grass can be found, complete vegetation control can be obtained with a herbicide such as Roundup.[®] For Roundup to be effective, the weeds and grasses must be actively growing. Where Roundup is used for weed and grass control, the field can be replanted about 2 weeks after treatment (the time required for the herbicide to kill existing vegetation). Prior to replanting, cultivate the field with a disk or tiller to alleviate soil compaction and to produce a finely pulverized seedbed for grass establishment.

Complete replanting by June 1 to have a good turf cover by fall. A good maintenance program can produce a dense turf cover on a football field in 8 to 10 weeks. Perhaps Bear Bryant said it best when Texas A&M's Kyle Field was renovated in 1956: "On June 1 the ground was bare, but by September 1 the turf was the best I have ever played on." Sprigging at a rate of 300 bushels per acre, watering as needed to keep the grass growing, fertilizing at a rate equivalent to 1 pound of nitrogen per 1,000 square feet every 2 to 3 weeks, and selective weed control provided the only magic needed to develop the turf on Kyle Field in 1956. That same "magic" can be performed on any sports field.

Bermudagrass provides an attractive, resilient playing surface for about 7 months out of a year: April through October. All bermudagrasses cease growth and become dormant during the winter months. Where the field is used extensively between January and April, as it is in collegiate and high school baseball and soccer, overseed bermudagrass with one or more of the improved perennial ryegrasses to provide color, uniform surface conditions, and resilience during the dormant period. The ryegrasses remain through the spring season and are gradually replaced by bermudagrass as it recovers in late spring. The transition from ryegrass to bermudagrass is smooth and essentially unnoticed by the players and fans.

Overseed in Late Fall

A successful overseeding program requires 4 to 6 weeks in the fall when the field is not in use. The overseeding operation does not interfere with the use of a field used exclusively for baseball. However, the football season overlaps with the optimum period for overseeding. The cost of overseeding is small compared to the benefits it produces, when you consider

that high school and college baseball is played during the time the ryegrasses are at their best and bermudagrass at its worst. The lush, dark green turf produced by the ryegrasses adds to the enjoyment of the players and fans.

To prepare for overseeding, thin the bermudagrass turf with a flail mower or dethatching mower. Sweep or vacuum the field after mowing to remove grass clippings and thatch. Where common bermudagrass is the permanent turf, close mowing may be the only operation required to develop a good seedbed for perennial ryegrass.

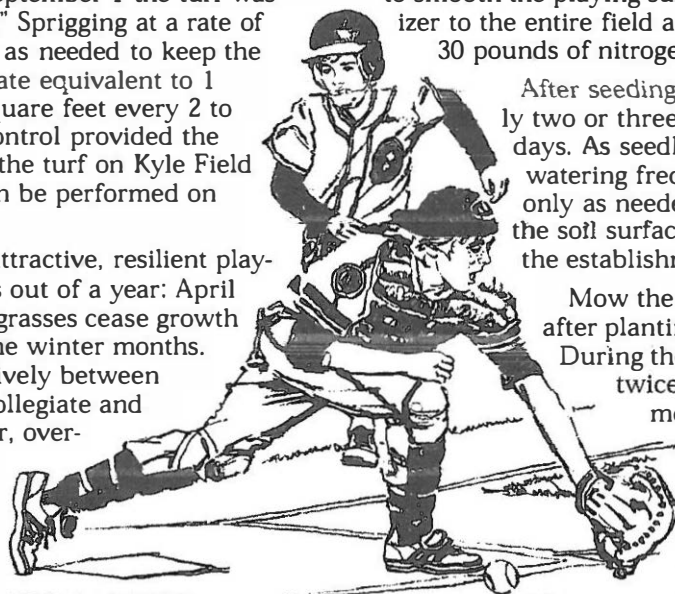
Seeding rates for perennial ryegrass range from 6 to 8 pounds of seed per 1,000 square feet on the outfield to 25 pounds per 1,000 square feet on the infield. In each of these areas, a drop-type distributor can be used to seed a border around each area to keep the seed off the dirt areas of the infield and the warning track. The area inside of the border can be planted with a cyclone-type distributor. Seed the outfield and sideline areas in two directions at right angles to each other. Seed the infield in four to five directions to ensure uniform seed distribution.

After seeding, topdress the infield with sand or sandy loam soil to smooth the surface and to help hold the seed in place. Drag the topsoil with a carpet drag to smooth the playing surface. Apply a starter fertilizer to the entire field after planting, at a rate of 30 pounds of nitrogen per acre.

After seeding and fertilizing, water lightly two or three times a day for 10 to 14 days. As seedlings emerge, reduce the watering frequency to daily and then only as needed. It is important to keep the soil surface moist but not wet during the establishment period.

Mow the ryegrasses about 2 weeks after planting at a height of $\frac{3}{4}$ inch.

During the late fall and winter, twice-weekly mowing and monthly fertilization are satisfactory to maintain the ryegrasses. During the spring months, the ryegrasses require mowing at 2-day intervals.



Prepare Non-Grass Areas

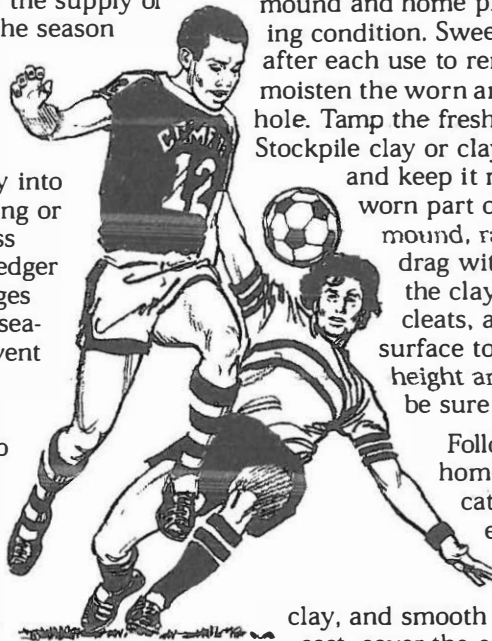
The non-grass (skinned) areas of the baseball field are as important to the playability and appearance of the field as the grass areas. Most field managers agree that skinned areas require more time to maintain than grass areas. The first requirement for the maintenance of the skinned areas is that they meet the specifications for whatever league the field is being used for.

The composition of the skinned areas must provide firm footing while remaining resilient. The dirt surface should be loose and firm and should readily absorb moisture. Slope the skinned areas toward the sidelines or outfield to provide surface drainage. Soils suitable

for the skinned areas range from a clay to a sandy clay loam. Work sand and calcined clay (Turface® or a similar product) into the skinned areas throughout the season to maintain the loose, firm, and resilient nature of the playing surface. Stockpile and cover the supply of topsoil, sand, and calcined clay before the season begins so that they remain dry and available when needed.

Before the season opens, scarify the skinned areas to loosen the soil several inches deep. Work sand or calcined clay into the top inch or two of soil by hand raking or dragging with a nail drag. Trim the grass edges of the infield with a mechanical edger and lift the sod by hand to keep the edges sharp. Repeat several times during the season to keep the edges sharp and to prevent soil buildup along the grass edge.

After each practice session or game, routine maintenance is required to keep the infield area in good playing condition. First, sweep the grass edge of the infield with a stiff broom to remove soil that was pushed onto the grass. This procedure is essential to prevent soil buildup along the grass edge of the infield. Next, hand-rake the areas around the bases to replace soil that was moved by players sliding into bases. Then, drag the skinned areas with a nail drag followed by a carpet drag to smooth the surface. Regular maintenance of these areas keeps the field in top playing condition and helps avoid major reworking of the skinned areas during the season.



Maintain Pitcher's Mound and Home Plate

A few minutes each day repairing the pitcher's mound and home plate area keeps them in good playing condition. Sweep the mound with a stiff broom after each use to remove any loose material. Then, moisten the worn area and add moist clay to fill the hole. Tamp the fresh clay to pack the mound.

Stockpile clay or clay loam soil to build the mound and keep it moist for regular repair of the worn part of the mound. After repairing the mound, rake the entire area by hand and drag with a steel mat or carpet drag. If the clay sticks to the equipment or to cleats, add sand or calcined clay to the surface to prevent sticking. Check the height and slope of the mound regularly to be sure they meet specifications.

Follow the same procedure on the home plate area: the batter's box and catcher's box. Sweep the boxes after each use, add fresh clay and tamp, rake the area by hand, drag it, topdress with sand and calcined clay, and smooth with a carpet drag. If rain is forecast, cover the entire infield with a tarp to keep the skinned areas dry.

Line and Mark the Field

Straight, sharp lines help define and dress up the field. Cut lines 2 3/4 inches wide and mark them with marble dust or paint. Re-mark all of the lines before each game day. A properly lined and marked field is essential to the playability and appearance of the field.

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Ballfield Maintenance Schedules

YEARLY MAINTENANCE SCHEDULE

- Winter field maintenance
 - Review plans for future field use
 - Develop a field maintenance plan
 - Purchase required field maintenance equipment
- Spring field maintenance
 - Paint dugouts, fencing, bleachers and field signs
 - Test the soil
 - Aerate, top dress and fertilize the field
 - Apply pre-emergent herbicides
- Fall field maintenance
 - Complete major field maintenance projects (e.g. renovations)
 - Test the soil
 - Aerate, de-thatch, over-seed, top dress and fertilize the field
 - Apply post-emergent herbicides
 - (Add ground limestone every other year)

IN-SEASON MAINTENANCE SCHEDULE

- Pre-practice field maintenance

- Remove tarps
- Water skinned areas and baselines
- Install bases, safety screens and batting cage
- Pre-game field maintenance
 - Remove tarps
 - Mow grass
 - Scarify and drag skinned areas
 - Water infield
 - Set the chalk lines
 - Install bases, safety screens, pitcher's mat and flags
 - Prepare the locker rooms, umpire rooms, press box, bullpens and dugouts
 - Test scoreboard, lights, and other electrical equipment
 - Dispose of trash
- Post-game field maintenance
 - Remove the bases, safety screens and batting cage
 - Drag skinned areas and baselines
 - Recondition bullpen, mound and home plate area
 - Replace and tamp loose divots in turf areas
 - Dispose of trash
 - Install tarps

Customer Service Center open M-F 7am-4:30pm (Central)

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