



Standard Guide for Maintaining Warm Season Turfgrasses on Athletic Fields¹

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1. Scope

1.1 This guide covers the minimum requirements for maintaining warm-season turfgrasses used for natural surface athletic fields. Practices covered include mowing, fertilization, irrigation, core cultivation, winter overseeding, pest management, and requirements for management of dormant turf winter overseeded with cool-season turf (see also Guide F2060).

1.2 The decisions involved in maintaining a quality natural playing surface should consider soil types, local climate and other factors. Therefore, it is recommended that you contact your local cooperative extension service for more specific information on soils, and grass species and cultivars adapted to your area.

1.3 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

F2060 Guide for Maintaining Cool Season Turfgrasses on Athletic Fields

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *athletic field*—a field constructed and utilized for conduct of various organized sporting events.

3.1.2 *overseeding*—the practice of seeding a turfgrass into a turf area that has an established turfgrass.

3.1.3 *thatch*—an accumulation of undecomposed organic matter that can form at the soil surface in a turf.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.3.1 *Discussion*—Excessive thatch is not normally a problem found on heavily used athletic fields that are properly maintained. If excessive thatch does occur, it may be removed or controlled by the practice of vermicutting.

3.1.4 *warm-season turfgrasses*—grass species widely adapted to warm temperate climates. Some species persist and are used in cool humid to cool sub-humid climates; referred to as a transition zone. Warm-season species commonly used for natural playing surfaces include hybrid bermudagrass, common bermudagrass, seashore paspalum, zoysiagrass, and kikuyagrass, and these turfs may be overseeded with a cool-season turf such as annual or perennial ryegrass in the winter months. Note that the use of kikuyagrass as a turf on athletic fields is not generally recommended. Kikuyagrass is included in this standard because despite its shortcomings as an athletic turfgrass, many athletic field managers are managing kikuyagrass athletic fields as it is an invasive, volunteer species. In some countries kikuyagrass is considered a noxious weed and its intentional use or planting may be banned.

4. Significance and Use

4.1 A dense, uniform stand of turfgrass on a playing surface improves the playing quality and safety of the field by providing firm footing for the athletes and by cushioning their impact from falls, tackles or slides. These standards are the minimum inputs required to provide such a surface. Various published guides have been used in the development of this standard (1-8).³

4.2 Field conditions may directly influence the frequency and type of athletic injuries occurring as a result of using the fields. While these standards do not guarantee that such injuries will be prevented, a well maintained turf on a natural playing surface should minimize field-related injuries.

5. Apparatus

5.1 *General*—Experience and good judgment are important to match the proper type of equipment to the nature of the task to be performed.

5.1.1 *Mowing Equipment*—Mower types include reel, rotary, and flail; although the latter type is not recommended for fine playing surfaces. A reel mower should be used for playing

³ The boldface numbers in parentheses refer to the list of references at the end of this standard.

surfaces requiring mowing at less than 2.5 cm (1.0 in.). Mower blades should always be kept sharp and properly adjusted in accordance to manufacturer’s recommendations. Mowing equipment should be operated in a speed range (ground and engine speed) consistent with the manufacturer’s recommendation.

5.1.2 *Spreaders*—Spreaders are necessary if dry fertilizer or pest control materials are to be applied. Spreader types may include drop, rotary (centrifugal, spinner), or oscillating. Spreaders should be calibrated to deliver the desired, labeled, or recommended rate of fertilizer or pest control product being applied.

5.1.3 *Sprayers*—Sprayers are necessary if liquid fertilizers or pest control materials are to be applied. Low pressure systems are recommended. Sprayers should be calibrated to deliver the desired, labeled, or recommended rate of fertilizer or pest control product being applied.

5.1.4 *Core Cultivators*—Core cultivation (aerification, coring) equipment relieves soil surface compaction. Core cultivators should be of the type that physically removes soil, such as a hollow tine or spoon. Cultivators with 1.3 to 1.9 cm (½ to ¾ in.) tines on spacing not more than 15 cm (6 in.) should be used on all playing surfaces. Spikers, slicers, or similar types of equipment are not as effective for relieving surface compaction. In addition to soil compaction found immediately at surface, the mechanical aeration practices may be performed such that the aeration tines penetrate to a depth sufficient to disrupt compacted layers. The effectiveness of such practices will depend upon equipment capabilities and adjustment.

5.1.5 *Seeders*—Broadcast or slit seeders should be used for any overseeding or renovation operations. Slit seeders cut a groove into the soil and deposit the seed in the groove at a predetermined depth. To achieve the same results, broadcast seeders will require a higher rate of seed application due to less effective seed-to-soil contact. Additionally, a broadcast seeded field will generally require more irrigation to effectively germinate seed compared to slit seeded fields. Seeding of bare soils can be accomplished by broadcast seeders, drop seeders, or slit seeders but each method will require a mulch for effective germination. Hydroseeding methods can be used effectively to apply seed and mulch in a hydrosurry to a bare soil surface but is not effective as a winter overseeding practice on existing turf.

5.1.6 *Irrigation System or Equipment*—Ideally some source of water should be available for irrigation. Systems can range from portable or permanently installed types.

5.1.7 *Soil Sampling Tube*—Used to sample soils for testing purposes.

6. Mowing

6.1 *Mowing (General)*—The periodic removal of excess shoot growth is necessary on natural surface playing fields.

6.2 *Mowing Height*—The mowing height of a natural surface athletic field will vary with the sport, turfgrass species, and time of the year. Adjust mowing heights accordingly, using the chart below:

Sports Field Use	Grass Species	Mowing Height
Baseball/Cricket Infields, Field Hockey Fields	hybrid bermudagrass, zoysiagrass, or seashore paspalum	6.4 to 19 mm (0.25 to 0.75 in.)
Baseball/Cricket/Softball Outfields; Soccer, Football, Lacrosse, Polo, and Rugby Fields; Intramural and Multiple-use Fields	hybrid bermudagrass, zoysiagrass, or seashore paspalum;	19 to 38 mm (0.75 to 1.5 in.)
	common bermudagrass, kikuyagrass;	38 to 64 mm (1.5 to 2.5 in.)
	bahiagrass	64 to 102 mm (2.5 to 4 in.)

NOTE 1—Adjustments in mowing height should be made to accommodate the sport using the field. Mowing heights should be increased by 25 % when the fields are not being used, or when the mowing height does not influence the game. A modest increase in mowing height adds photosynthetic leaf area to the turf canopy and may increase turf health and assist recovery rates of worn fields.

6.3 *Mowing Frequency*—Fields should be mowed as often as necessary. No more than 1/3 of the leaf surface should be cut off at any one mowing. Under normal growing conditions, this usually means every 5 to 7 days for fields maintained at 3.8 cm (1.5 in.) or higher, and two or three times a week for baseball infields and other closely mowed fields.

6.4 *Clipping Removal*—Fields maintained at a mowing height of 2.5 cm (1 in.) or higher do not require that the clippings be removed at mowing if mowed at the proper frequency interval. Only remove clippings if the grass is allowed to grow excessively high so that clippings would accumulate on the playing field surface. Playing surfaces maintained at one inch or shorter should have the clippings removed with each mowing.

6.5 *Mowing Pattern*—Mowing direction should be varied with each successive mowing. Striping of fields due to mowing direction can be accomplished with one or two mowings prior to an event.

NOTE 2—Seashore paspalum is the only warm-season turf that will produce a significant striping effect. Overseeded cool-season turfs may also produce a striping effect.

7. Fertilization

7.1 *Fertilization (General)*—Fertilization is essential for maintaining dense, vigorously growing natural turfgrass fields. Fertilizer rate, timing, source, and ratio will influence a natural turf’s density, color, uniformity, and recuperative ability, as well as its ability to tolerate wear, biological and environmental stresses.

7.2 *Soil Testing*—Soil testing should be performed on established fields every three to four years. More frequent testing (once or more per year) may be required on sand-based fields or those having nutritional imbalances. Soil testing will identify nutrient deficiencies that may be corrected by supplemental fertilizer applications or by fertilizer selection. Soil testing will also identify changes needed in soil reaction (pH).

7.2.1 *Sampling*—A representative sample should be taken from each field. Using a soil sampling tube, pull out about 50 random samples per acre of turf, and combine them to obtain a representative sample. Samples should be taken from the soil surface to a depth of 51 to 102 mm (2 to 4 in.).