

A GENERIC FOOTBALL FIELD MAINTENANCE PROGRAM

<http://turfgrass.hort.iastate.edu/extension/end.pdf>

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Football field management programs are uniquely different and are directly affected by field management practices such as mowing, watering, fertilizing, coring, topdressing, renovation, drainage, and many others. There are also many non-agronomic factors that ultimately influence the success of playing fields. The annual budget, field manager's expertise, equipment and resources available, and the relationships with coaches, parents, and administrators all have a profound affect on the safety and playing quality of the facility. Listed below are some of the basic agronomic and human resources that are needed to manage a safe and attractive playing surface.

- Indicates general football field maintenance
- ◇ Indicates intense management on high sand rootzone fields

Mowing

- Rule of thumb - "mow frequently enough so that no more than one-third of the grass height is removed at each mowing". If your mower is set at two inches, clippings should only be one-inch after mowing. Clippings should easily filter into the turf canopy and should not need to be removed from the field by sweeping or bagging.
- Reel-type mowers produce the best cut and make an attractive stripe. Out-front rotary mowers are more versatile and also produce an adequate cut for general sports turf reel-mowed at heights greater than 1 1/2 inch.
- For the best traffic tolerance, mow cool season grasses at two to three inches and warm season grasses at one to two inches.
- Mowing turf more frequently and at a lower mowing height will maximize turf density, mat, and biomass cushion. If irrigation and fertility requirements are adequately met then mowing 2 to 3 times per week or more at a height of 2 inches will maximize turf density. Taller mowing, 3 inches and above does not increase traffic tolerance but it does improve summer survival if water is limited.
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- ◇ Cutting heights of 3/4 to 1 1/2 inch are sometimes used under intense management. These lower mowing heights will require mowing every one to two days.

Watering

- Water only when the plant tells you. Look for the first signs of visible wilt and then water deep and infrequent. Mature turf can withstand moderate drying and this will increase root growth and prevent over watering of the field.
- Over watering can increase turf disease and create anaerobic soil conditions.
- When forcing growth with nitrogen fertilizer and when establishing grass from seed or sod, it may be necessary to water with lighter amounts more frequently.
- A permanent, and preferably automatic, irrigation system that evenly supplies a minimum of 1/4 inch water daily is desired.
- Commercial traveling gun sprinklers have also been successful when an automated system is not possible.
- Small homeowner-type sprinklers are not suitable for football field irrigation.
- ◇ Sand based systems will require an automated irrigation system that is capable of supplying light and frequent irrigation cycles for syringe cooling and seed establishment.

Fertilizing

- Have the soil tested once a year and make adjustments for pH, phosphorous, and potassium.
- In addition, apply potassium during the growing season at the same time and same rate as nitrogen.
- At least once per year, apply a complete fertilizer containing nitrogen, phosphorous, and potassium. There is no need to supply additional phosphorous when soil test levels are above 30 ppm P.
- Apply phosphorous in combination with coring to facilitate incorporation into the soil profile. Soils that test high in phosphorous (above 30 ppm) need no additional phosphorous during establishment.
- Nitrogen Fertilization Schedule:

Cool season grasses (bluegrass, ryegrass, and fescue)

March thru April

1.0 lb N/1000 sq. ft. from a soluble N source;

May

1.5 lb N/1000 sq. ft. from a slow release source;

Aug. thru Nov.

1.0 lb N/1000 sq. ft. per month from a soluble N source.

Warm season grasses (bermudagrass)

One month after green-up and two months before the first frost, apply 1.0 lb N/1000 sq. ft. per growing month.

- ◇ High sand content rootzones have low nutrient retention and require more frequent fertilization. A combination of tissue and rootzone nutrient testing is often used to fine tune frequent application of fertilizers. Anticipate applying nitrogen (N) and potassium (K₂O) at 1/2 to 3/4 lb/1000 sq.ft./growing month from April thru November. Three to five pounds of phosphorous (P₂O₅) per 1000 sq.ft. per year is usually sufficient on established sand based fields. Biostimulants, growth enhancers, and micro nutrients are often used to supplement the lack of nutrient retention and microbial activity in sand rootzones.

Pest Control

Contact your State Turfgrass Extension Specialist for local pest control recommendations. Pesticides are an effective way to control weeds, diseases, and insects when pest populations are high enough to cause turfgrass decline. Your goal should be to properly identify the pest problem in the early stages; determine if the pest population would significantly alter turf function; and develop a plan to reduce the pest population. Routine pesticide application as a preventative measure of pest control is not recommended on athletic facilities. Treat the pest curatively once it has been observed; and preventively only when you have had prior outbreaks and have good reason to suspect a recurrence.

Remember you are not exercising sound policy when pesticides are used as insurance against turf loss and as a substitute for proper employee training in turfgrass management.

- Weeds
 - Herbicide applications must be carefully scheduled to account for newly emerging turfgrass that may be part of your annual renovation program for high-traffic areas. Most herbicides are not labeled for use on newly planted or seedling turf.
 - Broadleaf weeds can be effectively controlled with selective post-emergent herbicides such as, 2,4-D, dicamba, MCPP, triclopyr, and clopyralid.
 - When annual grassy weeds are anticipated in established turf, control with pre-emergent annual grass herbicides, such as benefin, pendimethalin, prodiamine, dacthal, oxadiazon, and dithiopyr. Annual grassy

weeds such as crabgrass, begin to germinate when the soil temperature in the vicinity of the seed has been 55°F for five consecutive days. High traffic areas with exposed dark soil will warm faster than densely covered turf areas. Once these herbicides have been applied, reseeding must be delayed 12 to 16 weeks. Siduron is the only pre-emergent crabgrass herbicide labeled for use at time of seeding. Perennial ryegrass establishes root depth quickly and is more tolerant of surface barrier pre-emergent herbicides. Once an early spring seeding of perennial ryegrass has developed, Dimension can be used post-emergent to control pre-tillered crabgrass. Subsequent germination of crabgrass will also be controlled with dimension. It is critical that the perennial ryegrass is not stressed and has sufficiently established. Roots should be at least two inches deep and Dimension should not be applied until three to four weeks after perennial ryegrass germination. Drive is a more effective post emergence product that controls crabgrass even after it has tillered. It has the benefit of being used on spring and summer seedlings of Kentucky bluegrass, perennial ryegrass and tall fescue that are being invaded by crabgrass.

- Knotweed is especially competitive in high-traffic areas. Where knotweed is a problem and overseeding is not required, a late fall application of pendimethalin will give pre-emergence control of knotweed that normally germinates in early March. If the field is thin and you need to seed in the spring, then apply a broadleaf herbicide immediately after the knotweed has germinated (usually germinates first week in March). Wait at least two weeks after treatment before seeding.
- When renovating and reseeding high-traffic areas, seed at 1.5 to 2 times the normal seeding rate to give young turfgrass a competitive edge. High seeding rates will often make young turf out-compete weeds and make herbicides more effective.

- Diseases

Specific turf diseases can be managed with fungicides and cultural practices such as mowing, watering, and fertilizing. If you are experiencing routine loss of turf from disease, it is time to change your management practices or select more disease-resistant grasses. Fungicide application should not be a routine practice on high school athletic fields. To prevent summer patch in sod harvested and laid in the summer, treat with Propiconazol (Banner) one week prior to sod harvest. Repeat treatment 21 days after laying sod.

◇ Kentucky bluegrass grown on high sand content rootzones is susceptible to summer patch, especially when combined with close mowing and forced growth from soluble nitrogen. Preventative fungicides should be applied three weeks before the first symptoms of wilt associated with summer patch appear.

- Insects

Subsurface feeding insects are of major concern because they feed on roots, cause turf to be easily dislodged, and result in poor footing. Know the life cycle of underground feeders such as grubs and anticipate when they may become a problem. Insecticides can give a quick kill once you know where and when a pest is present. Insecticide application should not be a routine practice on high school athletic fields. Lights from evening sporting events can attract the adult beetles of white grubs. Watch for May beetles and Masked Chafer beetles near the fourth of July. Inspect sod in late July and August for small grubs.

Cultivation

- Hollow and solid tine coring, drill coring, shatter coring, water jet coring, slicing, and spiking are methods of cultivation that are routinely used on football fields to reduce soil compaction. Vertidrain and Floyd McKay drill can provide deep coring from 6 to 18 inches.
- Cultivation equipment physically penetrates the surface to improve air, water, and nutrient movement into the soil.
- Hollow-tine coring equipment is absolutely necessary in the management of athletic turf. Football fields should be aerated at least twice per year and high traffic areas may need to be cultivated four to six times per year.
- Select cultivation based on your specific needs, i.e.

General - For thatch control and water penetration hollow core the entire field twice per year with at least ten holes per sq.ft. (one hole every four inches).

High-traffic - Supplement high-traffic areas that become compacted with various types of cultivation. In high-traffic areas it is not uncommon to use some form of coring, slicing, or spiking six to eight times per year.

Renovation with reseeding – A combination of hollow coring and overseeding produces a good seed bed. It is not uncommon to core until there are 36 holes

per sq.ft. (one hole every 2 inches). Since most of the grass establishes within the aerifier holes, more holes mean more turf cover.

Renovation

High school football fields usually require renovation every one to three years. The extent and cost of renovation will depend on how long the field has been neglected. Typical components of a renovation are:

- Repair field crown by adding soil and grading.
- Core aerify and add a complete fertilizer and other soil amendments.
- Topdress with sand, sand/soil mix, calcined clay, or compost.
- Drill or slit seed in two to four different directions with commercial turf-type equipment. Drill seeding is preferred, but broadcast seeding in combination with power slicing and coring has also been successful.
- Water light and frequently until turf is established.

Renovation Example: The following example represents the maximum inputs needed to repair the high traffic areas on a field where football is played in the fall and soccer is played in the spring. Your program may only need some of the practices, choose what you can afford.

November

- Immediately after the last football game hollow core, topdress with 1/4- to 3/8-inch of sand and/or 1/4- to 3/8-inch compost.
- This is the best time to use a leveling drag to smooth out depressions and divots in the field. Additional topdressing may be needed so that the drag can effectively fill low spots on the field.
- Seed worn areas with 2 lbs Kentucky bluegrass/1000 sq.ft. and/or 10 lbs Perennial ryegrass. Broadcast and drag into aerifier holes, drill seed in multiple directions, or a combination of both seeding methods.
- Cover worn area of field (approximately 20,000 sq.ft. between the hash marks) with grow blanket, such as Evergreen Covermaster. Anticipate some seed establishment during the winter.

March

- Uncover field and inspect winter seed establishment. If bare areas remain, reseed as indicated above. Use solid tines if field is being used to avoid bringing plugs to the surface.

- From March through October continue seeding worn areas with divot mix (pregerminated seed, sand, and Turface).
- Minimize traffic by limiting field use to games only, no practice or other events.

May

- Immediately after the last soccer game hollow core, topdress with 1/4- to 3/8-inch of sand and/or 1/4- to 3/8-inch compost.
- Seed worn areas with 2 lbs Kentucky bluegrass/1000 sq.ft. and/or 10 lbs Perennial ryegrass. Broadcast and drag into aerifier holes, drill seed in multiple directions, or a combination of both seeding methods.
- Avoid spring application of pre-emergent herbicides that can damage seedlings and prevent new seed establishment (see weed control above).

May – August

- Do not allow bare areas to sit idle during the summer. They must be reseeded, sodded, or plugged so that the field has 100% turf cover before football starts in late August. Summer is not the best time to establish grass, but often it is the only time when the field is not being used.
- The field should be solid tined or hollow cored near the first of August in preparation for the fall season.
- By the middle of August you should be ready for the start of the fall football season. Don't let the field sit idle during the summer and then expect to get the field ready after the coach says something to you on the first of August. The start of high school summer vacation should signal you to begin preparation for fall football.

September – October

- Start seeding with divot mix as soon as divots or bare areas develop on the field. This will usually occur after the first game. Pregerminated seed that is not used on the game field can always be used on the practice field.
- Solid tine aerification can be used during the fall football season with minimal disturbance to the field. Solid tines are often used during the season to reduce surface hardness, increase initial water infiltration, and prepare holes for seeds to establish.
- With minimal effort, seeding bare areas just prior to a game will allow some seed to be "cleated into the soil" for better establishment. Seed that remains on top of the ground seldom establishes. Pre-germinated seed can be added to sand, calcined clay, or compost to make a divot mix to quickly repair divots and worn areas that occur during the playing season. A season long program of reestablishing grass is better than waiting to plant seed once or twice a year.

Traffic Control

Managing a football field requires coordination among the administrator, coach, band director, and grounds manager. Administrators should keep in mind that proper traffic control costs nothing in terms of dollars and at the same time offers the most effective means of reducing dangerously worn areas on game and practice fields. Understanding your role as a user of the field is a first step in communication.

- The coach must take an active interest in scheduling practice activities and preventing excessive turf wear. The coach and the grounds manager can work together to develop improved grass areas specifically for drills that are conducted off the game and practice fields.
- The band director should have a practice field painted on another grass area or in a parking lot. The area should be situated so that the practice can be viewed from above, as if you were in the bleachers. 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. No activity (band, football, or field maintenance) should be conducted on the field while there is frost on the grass.
- The grounds manager should realize that he/she is caring for a multi-use facility rather than just a football field. Extra use requires additional labor, equipment, and resources.
- The administrator should clearly define the conditions for using the field. As much as possible, reserve the field for games only. Be prepared to allocate resources on an annual basis for field maintenance and on a less frequent basis for field renovation. Have a process and personnel in place that will be used to determine when games are canceled because of field conditions.