



# Turfgrass Management of Bermudagrass Football Fields

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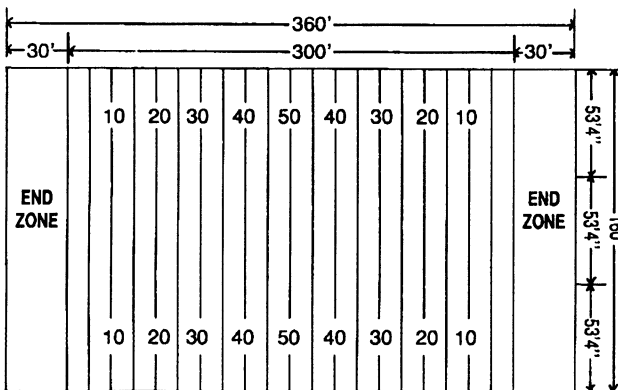
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The first step in developing a turfgrass management program for a football field is to understand the various component areas that make up the entire field. A regulation football field is 360 feet long and 160 feet wide, or 57,600 square feet, or 1.32 acres. Look at the field as 58 units of 1,000 square feet each and break the field down into component areas including the central playing area, the outer playing area, and the end zones (Figure 1). If you know the area of each component, it is easy to determine the supplies (i.e., fertilizer, herbicides, seed, sod, etc.) you will need to maintain that area. It will also help when scheduling labor to do the various jobs.

A second consideration is the development of turfgrass maintenance practices to ensure a healthy stand of turf. A calendar of proposed management practices should be developed which take into account low, medium and high requirements for labor and materials needed for the different management areas on the field. The calendar can be divided into cultural practices which promote growth (i.e., watering, fertilizing, aerification, etc.), and those that prevent pest problems from occurring (i.e., weeds, insects, and disease).

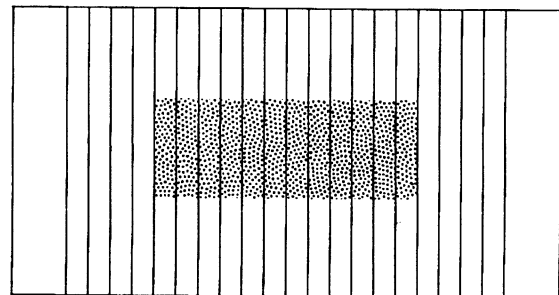
**a) FOOTBALL FIELD**

360' x 160' = 57,600 sq ft  
one unit = 1000 sq ft  
57.6 units 57,600 sq ft



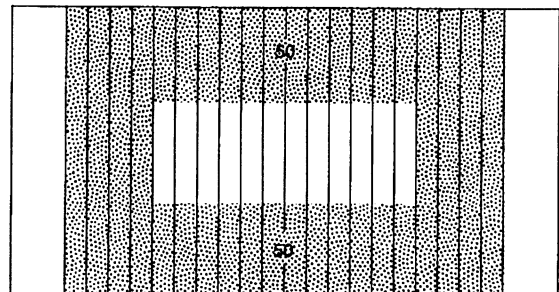
**b) Central Playing Area**

180' 53'4" 9600 sq ft 9.6 units



**c) OUTER PLAYING AREA**

38,400 sq ft 38.4 units



**d) END ZONES**

160' x 30' x 2 = 9600 sq ft 9.6 units

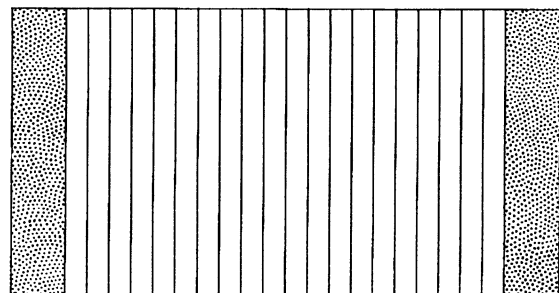


Figure 1. A regulation football field is (a) 57,600 square feet and should be playing area, (c) outer playing area, and (d) endzones.

The central playing area will need more attention than the outer playing areas and end zones. Therefore, when preparing a maintenance calendar (Figures 2, 3 and 4) for the football field, allocate more of your resources to the central playing area than the outer playing area and end zones. When scheduling work that will take more than one day, always start at the center of the field.

### Minimum Care Program

#### Renovation

- Seed (2-4 Lbs./1000 sq. ft.) or sprig (10 Bu./1000 sq. ft.) bermudagrass in the spring of each year in high traffic areas

#### Mowing

- Frequent and at proper height
- Spring 1 1/2 inches
- Summer 2 inches
- Fall 2 1/2 inches

#### Fertilizing

- Three to five times per year (4-6 Lbs. N/1000 sq. ft./ year)
- Soluble nitrogen sources
- Do not apply more than 1.5 lbs N/1000 sq. ft. from a soluble nitrogen source in a single application.
- Complete (N-P-K) fertilizer in spring and fall
- Fertilizer applied in July need only contain nitrogen

#### Watering

- Programmed to correspond with fertilization
- Avoid wilting during dry periods (July through August)

#### Dethatching

- Vertical mow areas where thatch has built up once in the spring

#### Aerification

- Three to five times during early spring before a pre-emergent herbicide is applied

#### Weed Control

- Post-emergent herbicides to control broadleaf (2,4-D, MCP, 2-4-DP) and grassy (MSMA, DSMA) weeds.
- Pre-emergent herbicide applied in spring to control annual grassy weeds (Many are available, contact your county agent for details)
- Do not apply pre-emergent herbicides in areas that are going to be renovated

### Medium Care Program

#### Renovation

- Seed (2 -4 Lbs. / 1000 sq. ft.) or sprig (10 Bu. / 1000 sq. ft.) bermudagrass in the spring of each year in high traffic areas

TURF MAINTENANCE CALENDAR												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>Promoting Growth:</b>												
Renovate												
Mowing												
Fertilization					F		F		F			
Watering												
Dethatching			XXX									
Aerification												
Soil Analysis		??										
<b>Pest Protection:</b>												
Post-emerge					X	X			X	X		
Pre-emerge*			P	P								

\*Do not apply a pre-emergent herbicide in areas that are going to be renovated.

Figure 2. Minimum Care turf maintenance program for bermudagrass football fields in Oklahoma.

**Mowing**

- Frequent and at proper height
- Spring 3/4 inches
- Summer 1 1/2 inches
- Fall 2 inches

**Fertilizing**

- Five times per year (6 Lbs. N/1000 sq. ft./year)
- Soluble nitrogen sources
- Complete (N-P-K) fertilizer in spring and fall
- Fertilizer applied in June, July and August need only contain nitrogen

**Watering**

- Programmed to correspond with fertilization
- Maintain good color and vigor

**Dethatching**

- Vertical mow once in the spring those areas where thatch has built up
- Program to correspond with pre-emergent herbicide applications

**Aerification**

- Six to eight times per year
- Two to three times before a pre-emergent herbicide is applied
- Two to three times in early summer
- Two to three times at the end of football season

**Weed Control**

- Pre-emergent herbicide applied in spring and early summer
- Post-emergent herbicide applied in fall and late winter to control annual broadleaf and grassy weeds (a nonselective herbicide such as Roundup can be used during January through February 15)
- Post-emergent herbicides in summer to control annual broadleaf and grassy weeds
- Do not apply pre-emergent herbicides in areas that are going to be renovated

**Maximum Care Program**

**Winter Overseeding**

- Seed football fields with annual or perennial ryegrass (10-15 Lbs./1000 sq. ft.) in September

**Renovation**

- Sod or sprig (10 Bu./1000 sq. ft.) bermudagrass in the spring of each year in high traffic areas

**Mowing**

- Frequent and at proper height with a reel mower only
- Spring 3/4 inches
- Summer 1 inches

TURF MAINTENANCE CALENDAR												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>Promoting Growth:</b>												
Renovate				██████████								
Mowing	██████████			██████████			██████████			██████████		
Fertilization					F	F	F	F	F			
Watering	██████████			██████████			██████████			██████████		
Dethatching		XXXX										
Aerification			██████████			██████████					██████████	
Soil Analysis		???										
<b>Pest Protection:</b>												
Post-emerge	X	-----	X			X	-----	X		X	-----	Y
Pre-emerge*			P	-----	P			P	-----	P		

\*Do not apply a pre-emergent herbicide in areas that are going to be renovated  
 Figure 3. Medium care program for bermudagrass football fields in Oklahoma.

**Fertilizing**

- Five times (7 times if winter overseeding) per year (6-8 Lbs. N/1000 sq. ft./year)
- Fast and slow-release nitrogen sources
- Complete (N-P-K) in spring and fall
- Fertilizer applied in June and August need only contain nitrogen

- Twice during football season
- Once or twice at end of football season

**Watering**

- Program to correspond with fertilization, aerification, and herbicide treatments
- Maintain good color and vigor
- Never allow the field to wilt

**Top Dressing**

- Two times per year with a sandy loam soil
- Program to correspond with renovation and overseeding

**Dethatching**

- Vertical mow once in the spring those areas where thatch has built up
- Programmed to correspond with pre-emergent herbicide applications

**Weed Control**

- Pre-emergent herbicides applied in fall and spring, half-rate application in late spring or early summer
- Post-emergent herbicides applied in late winter to control annual broadleaf and grassy weeds (a non-selective herbicide such as Roundup can be used during January through February 15)
- Post-emergent herbicide applied in summer to control annual broadleaf and grassy weeds
- Do not apply pre-emergent herbicides in areas that are going to be renovated

**Aerification**

- Eight to twelve times per year starting in March
- Two to four times in spring and early summer before a pre-emergent herbicide is applied

**Insect Control**

- Insect problems such as white grub, sod webworm, and cutworms can be controlled during the Spring and Fall of the year

TURF MAINTENANCE CALENDAR												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>Promoting Growth:</b>												
Winter Overseed									■ ■ ■ ■ ■ ■ ■ ■			
Renovate				■ ■ ■ ■ ■ ■ ■ ■								
Mowing												
Fertilization					F	F	F	F	F	(F)	(F)	
Watering												
Dethatching			X	X X X								
Aerification			■ ■ ■ ■ ■ ■ ■ ■		■ ■ ■ ■ ■ ■ ■ ■			■ ■ ■ ■ ■ ■ ■ ■				
Soil Analysis		???										
<b>Pest Protection:</b>												
Post-emerge		X X X X			X X X			X X X X X				
Pre-emerge*			P—P		P—P			P—P				
Insecticide												
Fungicide												

## Disease Control

- During the warm, humid spring and fall of the year control of plant diseases may be required. Damping off diseases can be a problem when overseeding with perennial ryegrass

A good breakdown of the athletic field areas combined with a maintenance calendar based on sound turfgrass recommendations can be used to develop a budget for the required labor and materials. Once this information is pulled together into a *budgeted maintenance program*, then the turfgrass manager has a good guideline on which to conduct the maintenance program. It is not always possible to take into consideration every consequence when preparing a budget for turfgrass maintenance (i.e., weather, equipment breakdowns, unexpected pest problems, etc.), but with a *good guideline*, and subsequent *record keeping* on actual labor and material costs, the turfgrass manager will become *more efficient* at adequately budgeting and solving turfgrass problems.

The budget can be prepared using several different methods. However, when the fields are broken down into units of 1000 square feet, estimates for maintenance costs can be adjusted more easily. For example, the entire field may not need to be sodded, but it will need fertilizer. Fill in the frequency per field, the number of fields, the units per field, the amount of material or labor needed per unit, and the cost per amount needed (Table 1). The product of these five numbers will be the estimated expense for each item. Subtotal each maintenance practice, (i.e., Renovation, Mowing, Fertilization, etc.) and the total of all maintenance practices.

If the estimated budget is too large, then before eliminating an entire maintenance practice, try reducing the number of units per field or the frequency per field. Remember, the central playing field is around 10 units and will need more care and attention. *Concentrate your resources* on these 10 units and work outwards towards the sidelines and endzones.

## Soil Fertility

Initial phosphorus level in the soil should be "High". If not, bring it up to high as shown below.

Phosphorus Level Reading	Suggested Rate of $P_2O_5$ Application*	
	Standard Football Field (1.32 acres)	Per 1000 Sq. Ft.
Very Low	195	3.4
Low	126	2.2
Medium	69	1.2
High	none	none

\*Ten pounds of 0-20-0 will equal 2 pounds of P205

\*Ten pounds of 0-45-0 will equal 4.5 pounds of P205.

\*One pound of P205 is equal to .44 pounds of (P) phosphorus.

Initial potassium level in the soil should be "High" if not, bring it up to high as in following table.

Phosphorus Level Reading	Suggested Rate of $K_2O$ Application*	
	Standard Football Field (1.32 acres)	Per 1000 Sq. Ft.
Very Low	195	3.4
Low	126	2.2
Medium	69	1.2
High	none	none

\*Ten pounds of 0-0-60 will equal 6 pounds of K20

\*One pound of K20 is equal to .83 pounds of (K) potassium.

The recommended pH for bermudagrass is between 6 and 7. If the soil is acid, lime may be applied to bring the pH to this level. Finely ground limestone acts faster than coarsely ground material. For turf use, at least one-half should pass a 100 mesh screen and all should pass a 10 mesh screen.

pH	Suggested Rate in Pounds Finely Ground Limestone*	
	1000 sq. ft.	Acre
Soil-buffer Index		
Over 7.1	0	0
7.1	15	667
7.0	15	667
6.9	23	1000
6.8	31	1333
6.7	39	1667
6.6	46	2000
6.5	61	2667
6.4	77	3333
6.3	92	4000
6.2	107	4667
6.1	122	5333
6.0	138	6000

\*NOTE-Hydrated lime can be used at 3/4 the rate of ground limestone.

The most convenient times to make lime applications are in the late fall, winter and early spring. Raw ground limestone can be applied at any time, but the summertime rate for hydrated lime should be under 1,000 pounds per acre, or 20 to 25 pounds per 1,000 square feet. Lime should not be applied immediately before or after fertilizer containing ammonia.

The lime, phosphorus and potassium can be incorporated into the soil to a depth of 4 to 6 inches at the time of establishment in order to achieve more immediate results.

## Field Drainage

The field design should provide for an 18-inch crown (1.87 percent slope), turtle-backed from center of field to sidelines, without pockets. In areas with sandy pervious soils, the slope may be reduced to one percent. The parallel sidelines should be level.

Place tile systems along the sidelines with catch basins to remove water more rapidly than it will be absorbed through the soil. Except for cases of seepage or high water tables, tiling the entire playing area may do little good because surface compaction impedes water movement to the tile except in the strips immediately over the tile lines.

**Table 1: Intramural Maintenance Budget**

ITEM	Col. 1 FREQ./ FIELD	Col. 2 NO. OF FIELDS	Col. 3 UNITS*/ FIELD	Col. 4 AMOUNT/ UNIT	Col. 5 COST/ AMOUNT	Col. 6 + ESTIMATED EXPENSES
<b>RENOVATION:</b>						
Seed Bed Preparation					\$	\$
U3 Bermudagrass Sod					\$	\$
U3 Bermudagrass Sprigs					\$	\$
Guymon Bermudagrass Seed					\$	\$
Labor					\$	\$
<b>Renovation Expenses:</b>						\$
<b>OVERSEED:</b>						
Perennial Ryegrass					\$	\$
Vertical Mowing					\$	\$
Labor					\$	\$
<b>Overseed Expenses:</b>						\$
<b>MOWING:</b>						
7-Gang Reel Mower & Labor				0.012 HR**	\$	\$
72" Rotary Mower & Labor				0.025 HR	\$	\$
42" Mower & Labor				0.055 HR	\$	\$
32" Mower & Labor				0.065 HR	\$	\$
21 " Mower & Labor				0.110 HR	\$	\$
<b>Mowing Expenses:</b>						\$
<b>FERTILIZATION:</b>						
26-8-17 & Application					\$	\$
34-0-0 & Application					\$	\$
Labor					\$	\$
<b>Fertilization Expenses:</b>						\$
<b>IRRIGATION:</b>						
Labor to Run Irrigation					\$	\$
Repairs					\$	\$
<b>Irrigation Expenses:</b>						\$
<b>DETHATCHING:</b>						
Vertical Mower & Labor				0.03 HR	\$	\$
Ret'noval of Clippings				0.12 HR	\$	\$
<b>Dethatching Expenses:</b>						\$
<b>AERIFICATION:</b>						
Aerifier & Labor				0.05 HR	\$	\$
<b>Aerification Expenses:</b>						\$
<b>HERBICIDES:</b>						
Post (Trimec-Broad leaves)					\$	\$
Post (MSMA-Grasses)					\$	\$
Pre (Spring Weeds)					\$	\$
Pre (Fall Weeds)					\$	\$
<b>Herbicide Expenses:</b>						\$
<b>INSECTICIDES:</b>						
Diazanon (White Grub)					\$	\$
Dursban					\$	\$
Sevin					\$	\$
<b>Insecticide Expenses:</b>						\$
<b>FUNGICIDES:</b>						
As Needed					\$	\$
<b>Fungicide Expenses:</b>						\$
<b>ESTIMATED TOTAL MAINTENANCE COSTS:</b>						\$

\* One unit is equal to 1,000 square feet. Not all tasks will be required for the entire field, so use 1,000 square foot units to estimate materials and labor.

\*\* Time required in "man-hours" to complete a given task on 1,000 square feet. You will need to keep your own records to determine the time it actually takes to complete these jobs.

+ Multiply columns 1 through 5 to produce the estimated expense for each item.

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