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, fertilization, aeration, 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, MCPP, 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

*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.

HLA-6600-2
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

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

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

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>TURF MAINTENANCE CALENDAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoting Growth:</td>
</tr>
<tr>
<td>Winter Overseed</td>
</tr>
<tr>
<td>Renovate</td>
</tr>
<tr>
<td>Mowing</td>
</tr>
<tr>
<td>Fertilization</td>
</tr>
<tr>
<td>Watering</td>
</tr>
<tr>
<td>Dethatching</td>
</tr>
<tr>
<td>Aerification</td>
</tr>
<tr>
<td>Soil Analysis</td>
</tr>
</tbody>
</table>

| Pest Protection:          |
| Post-emerge               | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   |
| Pre-emerge *              | 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.

**Suggested Rate of K₂O Application**

<table>
<thead>
<tr>
<th>Phosphorus Level Reading</th>
<th>Standard Football Field (1.32 acres)</th>
<th>Per 1000 Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>195</td>
<td>3.4</td>
</tr>
<tr>
<td>Low</td>
<td>126</td>
<td>2.2</td>
</tr>
<tr>
<td>Medium</td>
<td>69</td>
<td>1.2</td>
</tr>
<tr>
<td>High</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

*Ten pounds of 0-0-60 will equal 6 pounds of K₂O

*Ten pounds of O-45-0 will equal 4.5 pounds of K₂O.

*One pound of K₂O is equal to .83 pounds of (K) potassium.

**Soil Buffer Index**

<table>
<thead>
<tr>
<th>pH</th>
<th>1000 sq. ft.</th>
<th>Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 7.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7.1</td>
<td>15</td>
<td>667</td>
</tr>
<tr>
<td>7.0</td>
<td>15</td>
<td>667</td>
</tr>
<tr>
<td>6.9</td>
<td>23</td>
<td>1000</td>
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<tr>
<td>6.8</td>
<td>31</td>
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<td>6.7</td>
<td>39</td>
<td>1667</td>
</tr>
<tr>
<td>6.6</td>
<td>46</td>
<td>2000</td>
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<td>6.5</td>
<td>61</td>
<td>2667</td>
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<td>6.4</td>
<td>77</td>
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<td>5333</td>
</tr>
<tr>
<td>6.0</td>
<td>138</td>
<td>6000</td>
</tr>
</tbody>
</table>

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

**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, tilting 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

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COL. 1</th>
<th>COL. 2</th>
<th>COL. 3</th>
<th>COL. 4</th>
<th>COL. 5</th>
<th>COL. 6 +</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FREQ./</td>
<td>NO. OF</td>
<td>UNITS/</td>
<td>AMOUNT/</td>
<td>COST/</td>
<td>ESTIMATED</td>
</tr>
<tr>
<td></td>
<td>FIELD</td>
<td>FIELDS</td>
<td>FIELD</td>
<td>UNIT</td>
<td>AMOUNT</td>
<td>EXPENSES</td>
</tr>
</tbody>
</table>

**RENOVATION:**
- Seed Bed Preparation
- U3 Bermudagrass Sod
- U3 Bermudagrass Sprigs
- Guymon Bermudagrass Seed
  Renovation Expenses:

**OVERSEED:**
- Perennial Ryegrass
- Vertical Mowing
  Overseed Expenses:

**MOWING:**
- 7-Gang Reel Mower & Labor
- 72" Rotary Mower & Labor
- 42" Mower & Labor
- 32" Mower & Labor
- 21" Mower & Labor
  Mowing Expenses:

**FERTILIZATION:**
- 26-8-17 & Application
- 34-0-0 & Application
- Labor
  Fertilization Expenses:

**IRRIGATION:**
- Labor to Run Irrigation
- Repairs
  Irrigation Expenses:

**DETHATCHING:**
- Vertical Mower & Labor
- Ret'noval of Clippings
  Dethatching Expenses:

**AERIFICATION:**
- Aerifier & Labor
  Aerification Expenses:

**HERBICIDES:**
- Post (Trimec-Broad leaves)
- Post (MSMA-Grasses)
- Pre (Spring Weeds)
- Pre (Fall Weeds)
  Herbicide Expenses:

**INSECTICIDES:**
- Diazanon (White Grub)
- Dursban
- Sevin
  Insecticide Expenses:

**FUNGICIDES:**
- As Needed
  Fungicide Expenses:

**ESTIMATED TOTAL MAINTENANCE COSTS:**

* One unit is equal to 1,000 spare 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.
The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

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Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
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