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Bulletin 202

Athletic Fields: Design, Construction, and Maintenance

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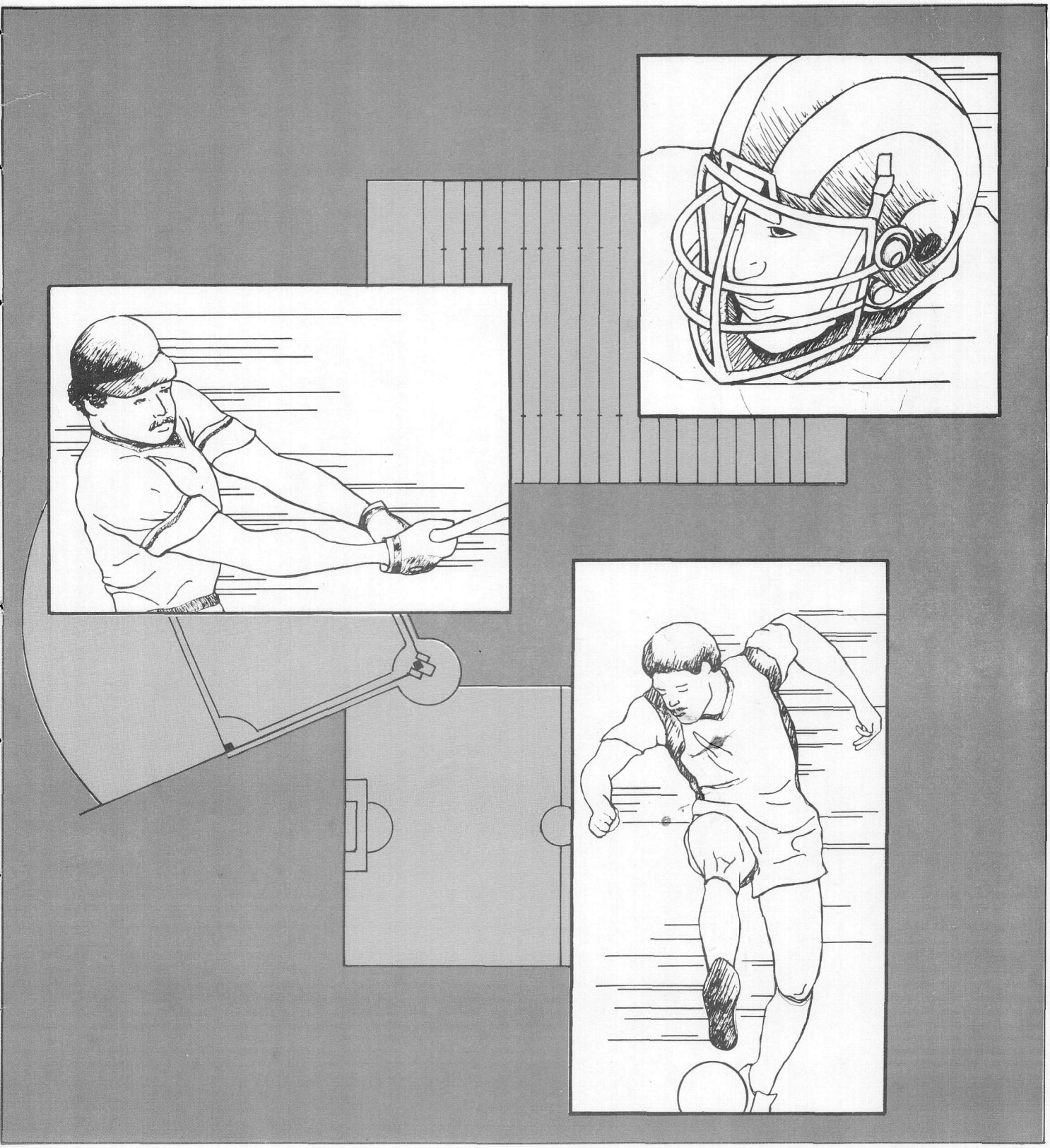

Athletic Fields:
Design, Construction, and Maintenance

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Athletic fields play a key role in recreational activities for people of all ages. The need for high quality turf that will withstand heavy wear increases as more facilities are developed and use on existing areas increases. Production and maintenance of a dense, wear-resistant sod is essential to provide playing safety by cushioning falls, ensuring good footing, as well as having a pleasing appearance. Proper construction and maintenance are essential in establishing and maintaining a healthy, dense turf. Too often routine maintenance is neglected until heavy use has taken its toll. This bulletin provides information about design, soil preparation, grass selection, establishment, primary and supplemental cultural practices, and pest control on athletic fields.

DESIGN

All athletic fields should be designed and constructed to meet standard dimensions of the game for which they will be used. Contours and drainage provisions are very important since these provide for fast removal of surface water to maintain desirable playing conditions. Whenever possible, fields should be laid out with the axis running north and south. A good design will provide for installation of an adequate irrigation system, drainage, and proper orientation of the field.

Football Fields - Figure 1 shows plans and elevations of a football gridiron. Proper grading and contouring provides for rapid removal of excess water. A drainage system under the entire field may not be necessary. The minimum drainage system should include parallel side lines that are level and drainage tile to remove surface water. A 10 to 18-inch crown down the center of the football field and sloped (1 to 1.9%) toward the side lines is necessary to drain surface water toward the side line drainage tile. If the field is intensively used or existing soils are poorly drained, a complete under-field drainage system and modification of the soil by addition of soil amendents is desirable.

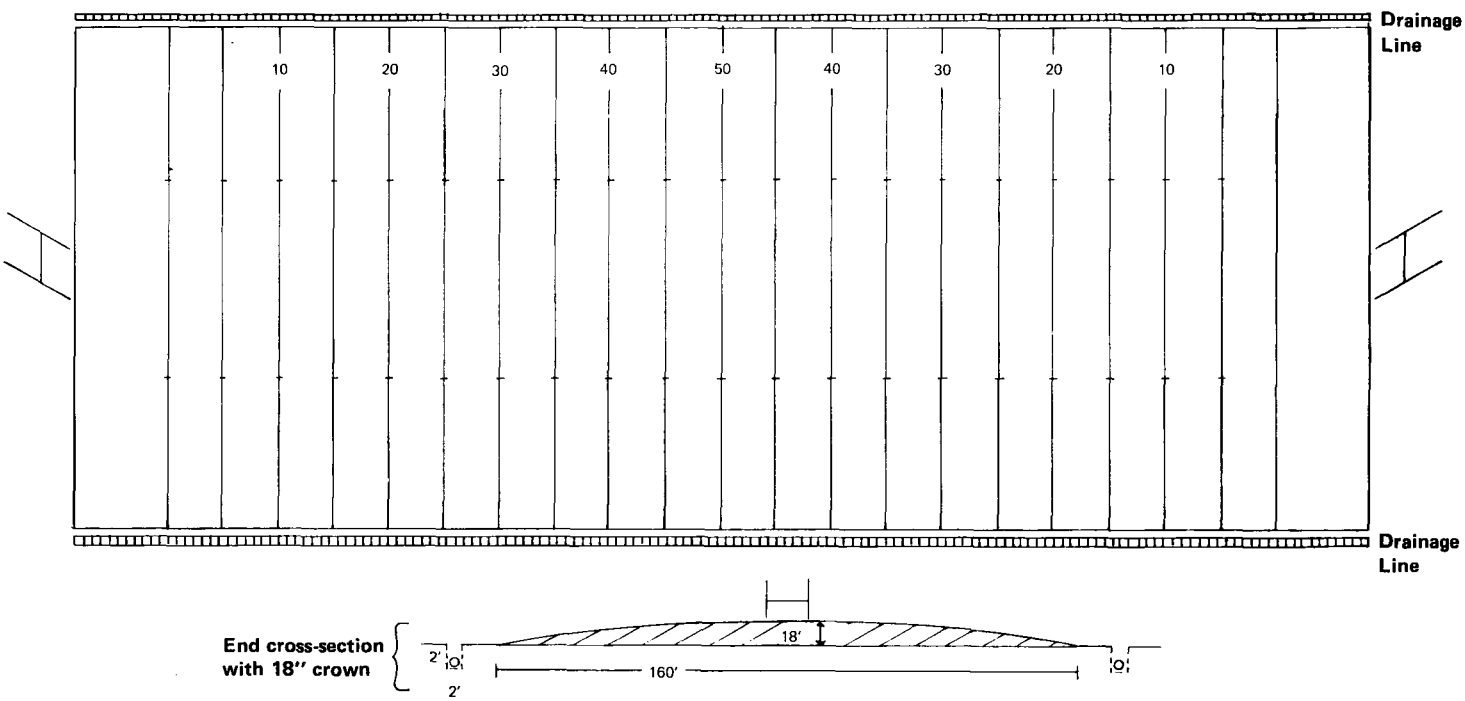

Figure 1. Diagram of a football field with plans and elevations for surface drainage and drainage lines.

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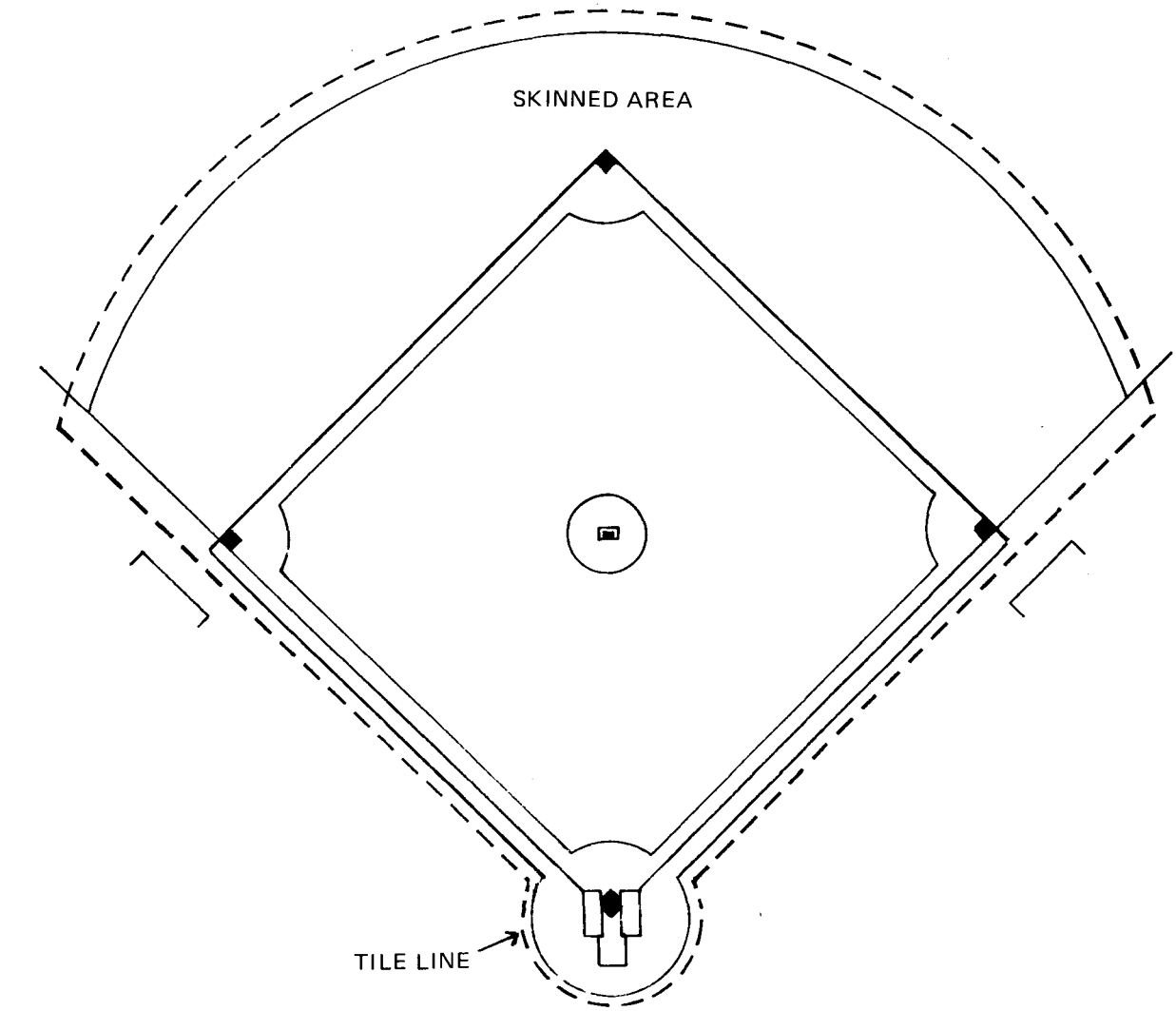
Soil compaction is a major concern on athletic fields. The area between "hash" marks in the center of the field receives heaviest play. Surface compaction can hinder water infiltration in this area. For this reason, drainage tile under the center area of the field may not be effective.

Baseball Diamonds - Drainage patterns for a baseball infield are included in Figure 2. The pitcher's mound should be elevated 15 inches (37 cm) above homeplate and the baseline. The mound should be "turtle-backed" so as not to fall abruptly from the edge of the mound area to the base paths and should have not more than 1% grade. Drainage to remove surface water should be installed on the periphery of the infield, at the edge of the skinned area and turf. Outfields should be graded with a 1% slope from the center in all directions and edged by a tile drainage system if necessary.



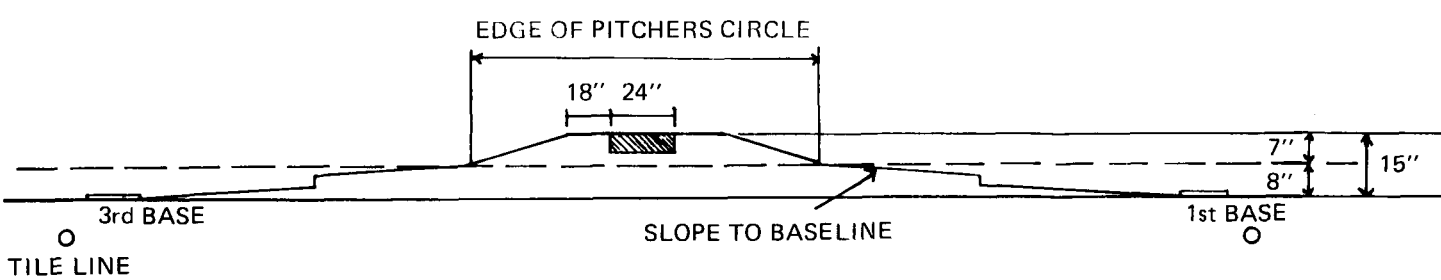


Figure 2. Diagram of a baseball in field with plans and elevations for surface drainage and drainage lines.

Soccer Fields - The design for soccer fields (Figure 4) should provide for a grade of not more than 1% from center crown to edge. This is much less than that permissible on a football gridiron. It is not advisable to use a football field for soccer since the high center crown makes side shots very difficult.

CONSTRUCTION

Good construction of an athletic field is a key to successful establishment and ease of maintenance. Construction should be started as early in the spring as possible to provide adequate time for full coverage of the turfgrass by opening date for fall play.

Clean Planting Area and Rough Grade - Remove all debris, brush, large roots, weeds, and old tree stumps. If extensive grading is needed, remove topsoil and stockpile it for replacement after the rough grade is established. Rough grade should conform to final grade (based on design considerations) after topsoil is replaced. Drainage lines should be installed at this point as per design specifications. If special problems exist, professional advice may be needed.

Soil Analyses - It is imperative to have a soil analysis made before planting. A representative soil sample can be obtained by collecting samples from 10 to 15 locations in the area from the top six inches (15 cm) of soil. Samples should be combined and thoroughly mixed. A portion of this can then be submitted for anaysis at the Florida Extension Soil Testing Laboratory. County Extension offices can supply additional information on soil testing.

A soil test will determine the pH value and the report will indicate if pH adjustment is necessary. If the soil is too acidic, (pH too low), dolomitic limestone (dolomite) is recommended for increasing

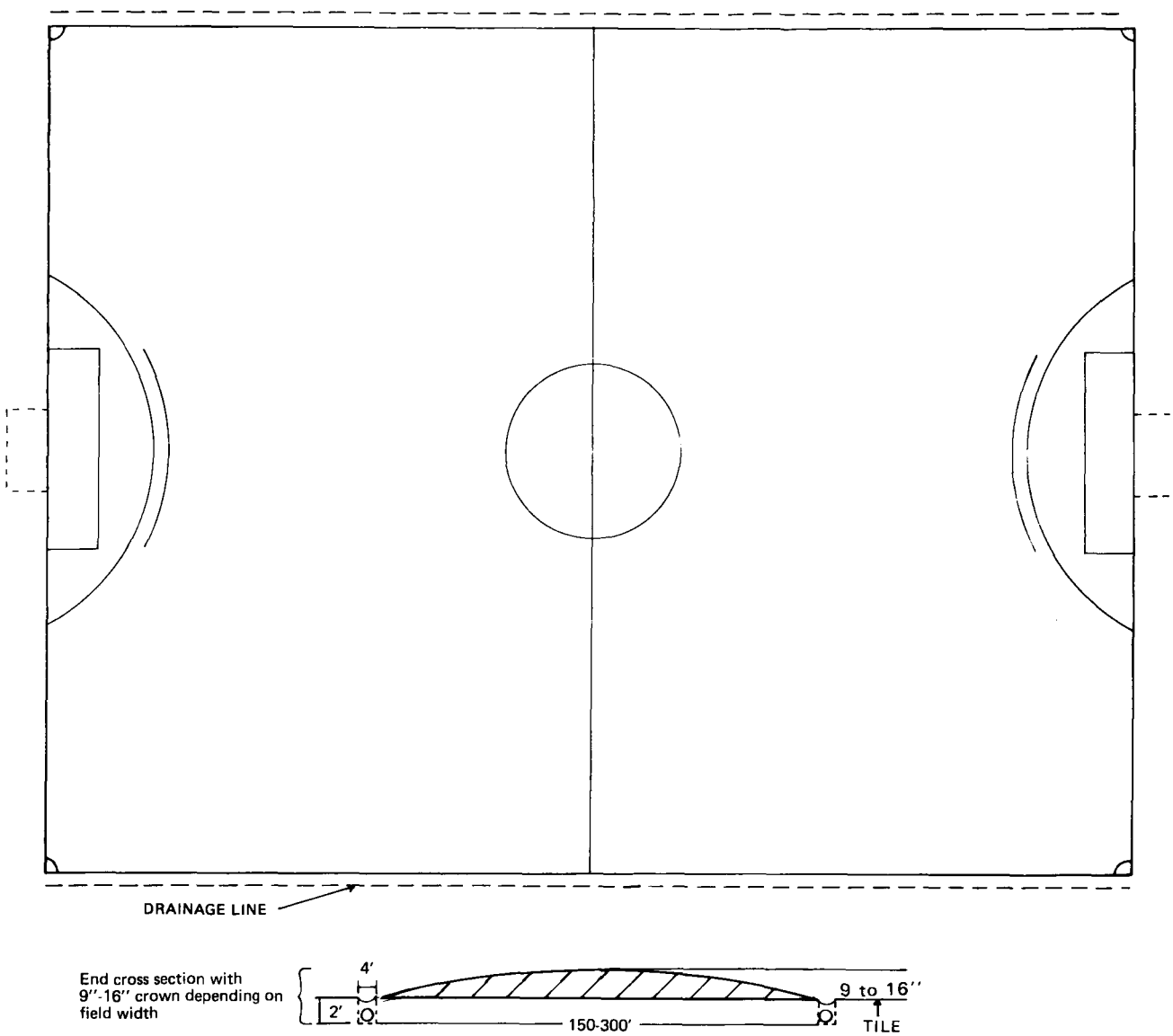


Figure 3. Diagram of a soccer field with plans and elevations for surface drainage and drainage lines.

soil pH. Application should be based on a lime requirement which considers both soil buffering capacity and soil pH value. If the soil is analyzed by the Florida Extension Soil Testing Laboratory, a lime requirement determination will be provided. If the analysis is made at the county Extension office or by an independent laboratory this may not be included. In lieu of a lime requirement analysis, the application of one ton of dolomite per acre (2240 kg/ha) or 50 pounds per 1000 square feet (250 g/m^2) is sufficient to increase the pH of most Florida soils one pH unit, for example, from pH 5.0 to 6.0. A desirable pH range for most turfgrasses is 6.0-6.5. Further details on soil pH adjustment can be obtained from the Florida Cooperative Extension Service in your county.

Based on the soil test analysis, fertilizer should be applied to correct soil nutrient level deficiencies. If phosphorous is deficient a basic fertilizer (0-20-0 for example) should be added and incorporated deeply into the soil prior to planting.

Installation of Irrigation Equipment - For optimum turf quality an irrigation system is considered essential for athletic fields. Wear tolerance is greatly reduced and recuperative capacity lowered if the turf is under drought stress. Installation of an irrigation system should follow rough grading, prior to addition of fertilizer and soil amendment. The system should be designed by an irrigation specialist and installed according to design specifications. An irrigation system's capacity to perform properly is limited by its design, construction and operation. A poorly designed or improperly installed system will never operate satisfactorily.

Soil Amendments and Fertilizers - Florida's sandy soils contain little organic matter and have very low water and fertilizer holding capacities. Addition of proper amendments to these soils can improve their physical and chemical properties by increasing water holding capacity and reducing leaching of fertilizer. Amendments may be organic or inorganic; however, organic amendments like peat and compost are rapidly decomposed by soil microorganisms. Inorganic amendments such as collodial phosphate are permanent. All organic materials should be sterilized to prevent introduction of pest problems. Use one cubic yard (0.75 cubic meter) of collodial phosphate (5% by volume) per 1,000 square feet (93 m^2) of area. If organic material is selected use reed-sedge or hypnum peat at the same rate. It is essential that any soil amendment be thoroughly incorporated after application.

Deep Tillage - Rototilling loosens compacted soil and improves the speed and depth of rooting. A tractor-mounted or self-propelled rotary tiller will do an efficient job of tilling the soil. If soil amendments, lime, or a basic fertilizer have been added in the preceding steps, it is necessary to incorporate them into the root zone during tillage. It is suggested the soil be tilled as deeply as possible, usually six to eight inches (15-20 cm) deep.

Soil Fumigation - The planting area should be sterilized after tillage but prior to final grading. Sterilization will kill weed seeds, insects, disease organisms, and nematodes and results in a nearly perfect planting bed for the turfgrass.

Methyl bromide is recommended for use at the rate of 1.0 lb (0.45 kg) per 100 square feet (9.3 m^2) Treated areas must be covered with a polyethylene cover under which methly bromide is injected. Follow manufacturers' recommendations and precautions for any soil fumigant used. These materials are highly toxic and require licensing for purchase and application. It may be easier to contact a pest control company which specializes in these services for the fumigation.

Final Grading - Final grading completed just prior to planting provides a smooth planting bed. Rake, harrow, or use a grading box to leave the soil surface smooth and following contours from design specifications. Roll or cultipack the area to firm the planting bed. Irrigation can be used to settle the soil before planting. Avoid rolling or cultipacking wet soil as compaction may occur.

GRASS SELECTION

The turfgrass best suited for a given field depends largely on the demands put on the turf, money available for maintenance, and on the quality desired. Other factors which should be considered in selection include; rate of establishment, color, texture, wear tolerance and recuperative potential, pest problems, mowing and fertilizer requirement.

Bermudagrass (*Cynodon* spp.) is the best choice of turf for athletic fields. It is extremely resistant to wear and will recover very rapidly from damage by cleats and traffic. Bermudagrass should be considered only in locations that receive full sunlight. Bermudagrass varieties suitable for athletic areas include:

'Tifway' - This variety is an aggressive dark green hybrid bermudagrass with fine texture and excellent density, cold tolerance, and disease-resistance. It is established vegetatively (sod or sprigs) and grows rapidly. From sprigs, expect full coverage in approximately 12 weeks.

'Tifway II' - This is an improved selection of Tifway. It resembles and has the same desirable characteristics of Tifway but it makes a denser, more weed-free turf; is more resistant to root-knot, ring, and sting nematodes; and exhibits longer fall color

retention and earlier spring greenup. Its management requirements are similar to Tifway.

'Common' - Does not have the density, disease resistance, and cold tolerance of the hybrids. Its major advantage is that it can be seeded.

Bermudagrass must be mowed, watered, and fertilized on a regular schedule for best appearance. Mowing and fertilization frequency may be decreased during the "off-season" periods, however, water must be applied as required. A well designed irrigation system is a must for bermudagrass. In general, bermudagrass athletic fields require a medium to high level of management to provide optimum turf conditions for play. Where finances dictate or irrigation is unavailable, bahiagrass should be considered as an alternative.

Bahiagrass (*Paspalum notatum*) can be used satisfactorily but produces an inferior quality turf compared to bermudagrass. Only one bahiagrass variety is suggested for use on athletic fields: 'Argentine' bahiagrass. This grass has good heat, shade, cold, disease, and drought tolerance. However, it is light green in color and very coarse textured. It forms an open sod that is much less dense and slower to recover from damage or wear than the bermudagrasses. Argentine bahiagrass can be readily established from seed with time required for complete coverage being dependent upon seeding rates used. Fertility, water, and mowing requirements are lower than for bermudagrass. Its coarse texture, open growth habit, seed head production, and mole cricket problems make it less desirable for athletic field use.

ESTABLISHMENT

Planting - Bermudagrass hybrids must be established vegetatively from sod or sprigs. Sod or sprigs should be purchased from a reputable grower that can provide quality planting material free of noxious weeds and pests and entirely true-to-type.

Sod should be laid on a moist planting bed. This ensures the new roots have exposure to adequate water for optimum growth. The pieces should be fitted together as tightly as possible and any cracks between the sod pieces filled with topsoil, not sand. Tamp or roll the sod to remove air pockets and ensure close contact between the sod and soil.

The most common method of establishing hybrid bermudagrass is by sprigging. Sprigs are broadcast over the prepared area at a rate of 200 bushels per acre and pressed into the top 2 inches (5 cm) of soil with a sprig planter, cultipacker or disc and lightly rolled to firm the planting bed.

If common bermudagrass or Argentine bahiagrass are to be seeded use 2 lbs of hulled seed per 1000 square feet (10g/m^2) of bermudagrass or 10 lbs of scarified seed per 1000 square feet (50 g/m^2) of Argentine bahiagrass. Spread the seed with a cyclone spreader with half delivered in one direction and half 90^0 to the other direction and till or work the seed into the upper 1/4 inch (6mm) of soil. Roll the area with a light roller after seeding. Brillion™ seeders are more efficient and do a better job of seeding since they have the advantage of speed, accurate seed placement and distribution, as well as leaving the seed covered. Mulch seeded areas with 100 lbs (45 kg) of weed-free grass mulch per 100 square feet (93 m^2). Seed planted May through August will germinate in 10 to 14 days, however, production of sod capable of withstanding heavy play requires several months.

Irrigation - It is critical that sprigs be planted as soon as possible after digging and then watered once they are planted. Soil should be kept moist around sprigs for two to three weeks after planting. Water twice daily (10:00 a.m. and 2:00 p.m.) during the first 3 weeks following planting. Usually 1/10 inch (2.5 mm) of water per application is sufficient to keep sprigs, sod, or seed wet. Once rooting or germination occurs watering frequency may be decreased to once daily at the rate of 1/4 inch per application until turf is well established. Water as necessary after turf has become established.

Table 1. Planting varieties and rates.

Grass Variety	Rate/1000 ft^2 (93 m^2) Sprigs	Seed	
Bermudagrass	Bu*	lbs	g/m^2
Tifway	3-5		
Tifway II	3-5		
Common			
Bahiagrass		2	10
Argentine		8-10	40-50

***Bushels of fresh sprigs.**

Fertilization - Apply a complete fertilizer (4-1-2, 3-1-2, or 1-1-1- analysis) at the time of vegetative planting, or after germination occurs if seeded, at a rate of 1.0 lb of soluble nitrogen per 1000 square feet (5.0 g/m^2). Apply ammonium nitrate or ammonium sulfate at a 0.5 lb N/1000 ft^2 (2.5g N/m^2) rate every week until the turf has covered. Every fourth application or once a month use a complete fertilizer in a 1-1-1 or 1-0-1 ratio at a 0.5 lb soluble N/1000 ft^2 (2.5g N/m^2) rate. Water in all fertilizers immediatly following application.

Mowing - When bermudagrass is approximately 1.5 inch (4.0 cm) high begin mowing with a reel mower at a 1.0 inch (2.5 cm) height. Start mowing bahiagrass at a cutting height of 3.0 inches (7.5 cm) with a rotary or reel mower once it reaches 4 inches

(10 cm). During establishment mow both types of grass one time per week. Increase mowing frequency once active growth begins so that no more than 1/3 of the leaf blade is removed at any one time.

Weed Control - Herbicides should not be necessary if the soil was properly fumigated. If necessary, they may be applied to bermudagrass and bahiagrass 2 to 3 weeks after planting or 3 to 4 weeks after seedling emergence once active growth begins. Arsenicals such as DSMA or MSMA may be used for grassy weed control (goosegrass, crabgrass, crowfoot) in bermudagrass but ***not*** in bahiagrass. Apply DSMA or MSMA at a rate of 4 or 2 lbs active ingredient per acre (4.4 or 2.2 Kg a.i./ha), respectively. Usually two to three applications of either material at 7 day intervals are required for effective weed control. Add 2, 4-D with either herbicide, at the rate of 0.5 lb active ingredient per acre (0.6 Kg a.i,/ha) for broadleaf weed control. Broadleaf weeds can be controlled in bermudagrass or bahiagrass by using 2, 4-D at the same rate or dicamba at 0.125-0.25 lb active ingredient per acre (0.14 - 0.28 Kg a.i./ha).

MAINTENANCE:
Primary Cultural Practices

Height of Cut - The best cutting height for common bermudagrass is 1.5 inches (4.0 cm) and for Tifway and Tifway II one inch (2.5 cm). Argentine bahiagrass should be mowed at 2.5 to 3 inches (6.0 to 7.5 cm). Mowing at less than these recommended heights will thin the turf and it will be less able to withstand wear from heavy use. Proper mowing height helps maintain a stronger, deeper root system to sustain plant growth.

Mowing Frequency - Mowing frequency should be adjusted so that not more than 1/3 of the leaf surface is removed at any one mowing. For a common bermudagrass field, this would mean that it should be cut at 1.5 inches (4 cm) each time it reaches 2 to 2.25 inches (5.0-5.7) in height. The hybrid bermudagrasses should be cut at 1 inch (2.5 cm) each time they are about 1.5 inches (3.8 cm) high. Generally, this means a field should be cut about twice a week.

Argentine bahiagrass should be mowed weekly at 2.0 inches (5 cm) with a rotary mower during the playing season and at 3.0 inches (7.5 cm) as needed in the off-season periods.

Mowing Equipment - Type of mower will affect quality of cut. Reel mowers offer the best cut due to the scissors type cutting action. Rotary is the next best choice followed by a flail mower. Regardless of mower type, blades must be kept sharp!

Clippings - If mowing frequency is properly adjusted, clippings may be retuned without being detrimental to the turf. If clumping of the clippings occurs, they should be removed.

Irrigation

Frequency - Irrigation should be scheduled to supplement rainfall. On sandy soils, the turf will be under water stress in 3 to 4 days without irrigation or rain. Once under stress it is more prone to damage from wear or pests. It is important to provide irrigation to prevent stress, thus rain or irrigation is necessary every 3 to 4 days.

Volume - Apply 0.75 inches of water at each irrigation. On most Florida soils this will wet the entire root zone without leaching nutrients from the soil profile or percolating water below the roots. The irrigation system should be designed to deliver this amount of water in a reasonable time without puddling or run-off.

Fertilization

Proper fertilization is a very important part of an athletic field maintenance program. Turfgrasses do best when fertilized with a 3-1-2 or 4-1-2 ratio fertilizer.

Bermudagrass - Bermudagrass will require 5 to 7 pounds of nitrogen and 3 to 5 pounds of potassium per 1000 square feet per year (25 to 35 g N and 15 to 25 g K/m^2). Phosphorous application should be based on soil test results but at best one application a year is suggested. Micronutrients should be applied at least once a year and preferably more often, either with a complete fertilizer or an a separate application.

If the area is overseeded, additional fertilization may be required during the winter months. All fertilization schedules listed in the following tables can be modified to fit local conditions and serve only as guidelines. The key point in a fertilization program is to provide sustained availability of nutrients and avoid luxuriant growth.

Table 2. Suggested Fertilization Schedule for Bermudagrass Athletic Fields.

Jan*	Feb*	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec*
	N		C[1]		N[2]		C	N	C		C

*Fertilization on overseeded turf only
[1]Complete fertilizer in 4-1-2 or 3-1-2 ratio at 1 lb soluble N/1000 ft^2 (5 g N/m^2)
[2]Nitrogen only at 0.75 to 1.0 lb N/1000 ft^2 (3 to 5 g N/m^2).

Bahiagrass - Bahiagrass will require 4 pounds of nitrogen and 2 to 3 pounds of potassium per 1000 square feet (1.5 to 20 g N and 10 to 15 g K per m^2) per year. Phosphorous application should be based on soil test results but at least one application a year is suggested. Micronutrients should be applied at least once a year with a complete fertilizer or as a separate application. An application of iron at a rate of 0.10 per 1000 square feet (0.5 g/m^2) in a chelate form or 0.25 lb/1000 ft^2 (1.25 g/m^2) as iron sulfate should be made in the early spring.

A suggested fertilization program is outlined in Table 3. Summer fertilization (May through September) should provide only enough nitrogen to maintain satisfactory color and density. It is important not to overfertilize since this makes the grass more prone to insect and disease problems.

CULTIVATION

Vertical Mowing - Vertical mowing for thatch removal is a necessity for the hybrid bermudagrass and is suggested for bahiagrass. Vertical mowing should be done in the spring once active growth has begun. Blade spacings should be one inch (2.5 cm) for bermudagrass and three inches (7.0 cm) for bahiagrass. Blades should be set so as just to penetrate the soil surface (no more than 1/4" (6mm) deep). Run the mower at right angles in two directions. Vertical mowing can be done with small self-propelled units, but tractor-drawn units are larger, more powerful, and faster. Remove all vertical mower clippings and scalp the turf to 1.0 inch (2.5 cm) for bahiagrass or 0.5 inch (1.3 cm) for bermudagrass both before and after vertical mowing. Clippings can be raked or vacuumed but it is essential they be completely removed.

During the mid-summer, vertical mow again (two directions if appreciable amounts of thatch are present - especially in bermudagrass.) Remove the thatch by raking or vacuuming. If the amount of thatch present is minimal, vertical mowing may follow aerification to break apart the soil cores deposited on the surface during coring.

Immediately after coring, the soil cores should be broken up and scattered over the surface. A vertical mower may be use to break the cores apart and/or flexible steel drag mat used to pulverize and distribute the soils from cores over the surface.

Fertilize immediately following vertical mowing and keep irrigation at an optimum. Since disturbing the soil may expose dormant weed seed and initiate germination, use of a preemergence herbicide may be necessary following each procedure to minimize weed problems. See the section on weed control for herbicide recommendations.

Coring - Concentrated and frequent traffic usually produces a compacted, impermeable surface layer in the top 2 to 3 inches (5.0 to 7.5 cm) of the soil profile. When compaction occurs the amount of airspace in the soil is reduced. This results in a gradual thinning of the turf due to poor root growth where water and fertilizer movement are restricted and the water-to-air ratio in the soil has been altered.

The centers of football fields (crown area between the hash-marks), around the bench areas on the sidelines, areas of soccer fields near the goals, and baseball diamond infields are good examples of areas that are prone to soil compaction. Sandy soils are less subject to compaction, but it does occur where traffic from play and equipment are concentrated, especially on wet turf.

Coring is ***essential*** where concentrated and frequent traffic occurs. This operation relieves compaction, encourages deep rooting, and improves turf quality. Coring is best accomplished with a machine that will remove a soil core 3/4 inch to 1 inch (2-2.5 cm) in diameter to a depth of 4 to 5 inches (10-12.5 cm). A core of soil should be displaced and deposited on the surface allowing room for expansion in the area thus relieving compaction. Core the area in two directions. Fields should be cored twice, once in the spring (April or May) just before fertilization, and again in midsummer when grass is in active growth. If compaction from continuous use is a major problem additional corings should be scheduled, but only during a time of active growth.

Immediately after coring, the soil cores should be broken up and scattered over the surface. A vertical mower may be use to break the cores apart and/or flexible steel drag mat used to pulverize and distribute the soils from cores over the surface.

Topdressing - If low spots or ruts develop but renovation is not thought necessary, topdressing may be used to level and smooth the surface. Topdress in early spring immediately after fertilization

Table 3. Suggested Fertilization Schedule for Bahiagrass Athletic Fields.

Jan	Feb	Mar	Apr 1	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			C[1,3]		N[2]		C[1]	C			

[1]Complete fertilizer in 4-1-2 or 3-1-2 ratio at 1 lb soluble N/1000 ft^2 (5 g N/m^2) with micronutrients.
[2]Nitrogen source at 1.0 lbs N/1000 ft^2 (5.0 g N/m^2).
[3]Include iron either in the complete fertilizer or as a separate application.

and vertical mowing. Idealy, topdressing material should be of the same soil type as the playing field and sterilized to prevent introduction of weed seed. Use of a topdressing machine will ensure uniform application. Light frequent applications to build up low areas are preferred over less frequent, heavier applications. Allow turf density to increase between applications, but prevent layering topdressing material on thatch as it forms. Drag the topdresssing into the turf with a flexible steel drag mat.

Overseeding

Overseeding the field for winter play is optional. If play will continue through the months of December, January, and February, overseeding is stongly suggested to help protect the permanent grass from wear. If play will end in November or early December, it is not advisable to overseed. Overseeding competes with the permanent grass during spring green-up making management during the trasition period from cool-season to warm-season turf more demanding and difficult. Overseeding normally is done in late fall, ususally November. Seeding should be done with perennial ryegrasses or a mix which is predominately ryegrass because of its wearibility and fast growth rate. Seeding rates should range from 10 to 30 lbs of seed per 1000 square feet (50-150 g/m^2) depending on budget.

Preparation should include operations that will remove any accumulated thatch and ensure good contact between the seed and the soil. Generally, close mowing and vertical mowing are necessary before seed is applied. To ensure uniform seed coverage, seed should be applied in two directions (at right angles), and worked into the turf with a drag mat. After seeding, topdressing should be applied and worked into the turf to sandwich the seed and smooth the surface. The field should be watered twice a day for five to seven days. As the seedlings emerge watering frequency is gradually reduced to an as-needed basis. It is very important to keep the soil surface moist, but not wet, during the establishment period which varies from ten days to two weeks after planting.

Mowing at a one inch (2.5 cm) height of cut should begin once the grass reaches 1.5 inches (3.8 cm) for football and soccer fields. Baseball fields should be mowed at .5 inch (1.3 cm) height on the infield and 0.75 inch (1.9 cm) on the outfield. During fall and winter weekly mowing may be satisfactory but spring growth may require twice-weekly mowing at these heights of cut.

Seed should be kept on hand to patch worn areas after heavy use. Seed may be soaked in water for 24 to 48 hours, drained, and mixed with topdressing for sowing. It is important to repair worn areas as soon as play has finished. This will allow maximum time for turf to respond before the next activity.

Pest Control

Weeds - Weeds are seldom a major problem in a healthy turf. If problem weeds persist, control may be necessary. Weeds can be classified or grouped in several ways. Grassy weeds such as crabgrass (*Digitaria* spp.), goosegrass (*Eleusine indica*), and crowfootgrass (*Dactyloctenium aegyptium*) are annuals which naturally reseed. These are best controlled with preemergent herbicides. Postemergent control of annual grassy weeds is more difficult and may require repeated herbicide applications.

Annual broadleaf weeds can sometimes also be controlled preemergence, but are less difficult to control with postemergent herbicides than grassy weeds. The following chart may help in selection of the proper herbicides.

No selective control is available for perennial weeds such as torpedograss (*Panicum repens*) and if these are a problem, non-selective spot control in heavily infested areas may be necessary with glyphosate (Roundup, Kleen-up) followed by reestablishment of the permanent grass. For the most accurate information on weed control by herbicide application check with the local Florida Cooperative Extension Service agent.

Diseases - Diseases of bermudagrass rarely cause major problems if diagnosed early enough to control with a pesticide application. Preventative fungicide

Chemical

Weed Type	Preemergence	Postemergence	Trade Names
Summer grassy	benefin		Balan
	bensulide		Betasan, Presan
	DCPA		Dacthal
	Oxadiazon		Ronstar G
		MSMA, DSMA*	Various
Summer broadleaf		2,4-D, MCPP	Various
		dicamba	Banvel-D
		(combinations of above)	Trexsan, Trimec
Nutsedge (except purple nutsedge)		bentazon	Basagran

*** Do not apply on bahiagrass**

applications are not necessary except for overseeding where treated seed for *Pythium* control is suggested. If a disease problem is suspected, a sample can be submitted to the Florida Cooperative Extension Service Plant Disease Clinic by the county agent. Contact this individual for information on submitting samples for disease identification and control recommendations.

SPECIALTY AREAS

Baseball Infield - The non-grass or skinned areas of the infield are important from a playability aspect. The composition should provide firm footing, but also remain resilient. The surface should be loose and readily absorb moisture. To provide surface drainage, these areas should slope towards the sideline or outfield.

Soil types that are suitable for the infield range from loam to sandy loam or sandy clay loam. Sand alone does not provide the firm footing necessary for good playability. Clay should be added and worked into the native topsoil where sandy conditions exist.

The area can be smoothed by dragging with a steel mat and carpet drag. The grass edges of the infield should be edged with a mechanical edger and the sod lifted by hand to keep the edge sharp. Routine maintenance should include the grass edge of the infield being swept with a stiff broom to remove soil pushed onto the grass.

The pitcher's mound and home plate areas also require special attention. Clay or clay loam soils should be used for mound construction and a quantity of material stockpiled for repairs. The home plate area should receive similar attention to construction as to soil type. Each area should be swept with a stiff broom, moistened and repairs made with moist clay after use. The fresh clay is tamped by hand, raked, and dragged with a steel mat or carpet drag. The height and slope of the mound should be checked regularly to make certain they meet specifications. Soil around the bases should be similarly treated but thoroughly hand-raked to provide a loose, firm, resilient surface.

Soccer Goals - Heavy traffic around the soccer goals creates compaction and causes wear. These areas should be aerified thoroughly during the period of active growth and should receive additional fertilizer as needed to sustain growth during the playing season. Irrigation is a necessity on these areas to repair wear damage.

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