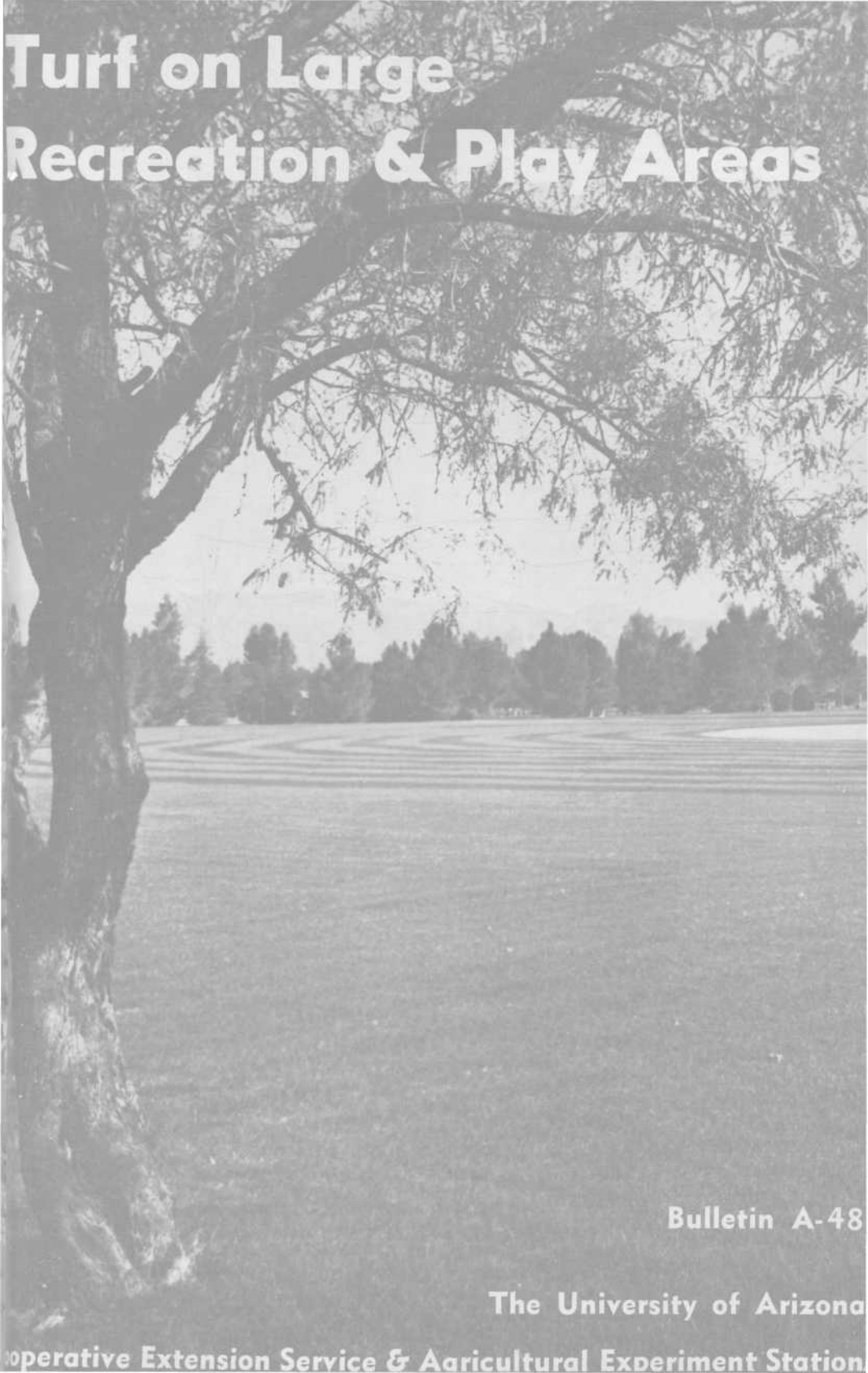
Turf on Large Recreation & Play Areas



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See the County Agricultural Agent in your County for other publications and for information on agricultural and home-economics subjects.

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Turf on Large Recreation & Play Areas

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More and more facilities are being provided to help persons find outlets for their increased interest in sports and other outdoor activities. This bulletin provides information on large turf areas — design, soil preparation, grass varieties, fertilization, mowing, and watering. These principles apply not only to parks, but also to athletic fields, playgrounds, recreation areas, camp sites, and other heavy-use areas.

Too frequently those responsible for selecting and maintaining an athletic field give it less attention than it deserves. Proper preparation and care of a field can:

1. Cut player injuries to a minimum when a springy, evenly-turfed field is provided instead of an uneven brick-hard surface.

2. Be instrumental in making a season successful, as is true when the early-season condition of a playing field is maintained until the season is completed.

3. Be a year-around attraction to campus and town — not a dust bowl at some seasons and a pond at others.

When constructing a new recreation area or athletic field, a number of factors such as drainage, physical soil properties, adequate fertility, and proper choice of grass should be considered. All of these factors greatly influence the ultimate quality of the playing turf. Proper consideration and attention to these factors during construction, coupled with a sound management program after establishment of the grass, provides assurance of top quality playing turf.

Reduction in player injury alone more than justifies any additional cost that might be involved in doing the job correctly from the beginning. Actually, experience has indicated that sound planning of construction pays dividends for many years. Costly annual renovation will be avoided and reduced maintenance costs will result from a properly constructed field.

Causes of Poor Turf

Much of the poor turf in recreation areas and on athletic fields in Arizona results from poor planning or management. The following are the principal causes for poor turf.

Improper Design or Construction

Many fields have been laid out almost table-top flat and poor soils have been used. Such conditions provide neither surface nor internal drainage of excess water from the field. As a result, a water-saturated condition may persist for several days. If play is permitted on the field when it is wet, the result in medium to heavy soil types is severe compaction and loss of soil structure, both of which interfere with air, water, and nutrient movement in the soil.

Over-use of Fields

Wherever possible, an extra practice field should be provided. Not more than about ten football or soccer games or their equivalent should be played on a field during one playing season. Baseball fields can tolerate more frequent use. All other practice sessions should be held on practice fields.

Mowing Too Close

Enough green leaf area should be left on the grass plants to support the plant and provide food for a well developed root system. The actual height varies with the type of grass being used.

Improper Fertilization

Too little or too much fertilizer, and poor timing of fertilizer applications are the causes of many turf problems. You should always have your soil tested as an aid in determining the fertilizer needs.

Lack of Water

Proper irrigation, especially during the summer months, often makes the difference between dense, high quality turf and sparse, clumpy cover.

Poor Judgment as to Time to Use the Field

This is especially true of practice sessions on wet soggy fields. Scheduled events, however, often must proceed regardless of condition of the playing field. The most important factor is the soil condition. Soils will "puddle" and lose their physical structure if disturbed while wet. This packs the surface and prevents normal air, water, and nutrient movement into the soil. Whenever possible, keep all traffic off the field while it is wet.

Wrong Species of Grass

The season of heaviest use should determine the grass species that is planted. For summer use, plant grasses such as Bermudas that grow best during the summer (warm-season species). For winter and spring use, plant or overseed with grasses which grow best during the cooler seasons of the year (cool-season species); annual rye grass at elevations under 4,000 feet.

Grading and Design of Athletic Fields

Field plans for a football gridiron, regulation baseball diamond, and a little-league baseball field are shown on pages 6 and 7. All athletic fields should be built to established specifications for the game for which they will be used.

Proper grading and contouring provides for rapid removal of excess water, thus reducing the likelihood of compaction. A 12 to 15 inch crown or turtleback down the center of a football field is essential.

A tile system of drainage under the entire field is not necessary unless seepage is a problem. Surface compaction usually renders a general tile system ineffective.

A baseball field should be laid out with the pitcher's mound elevated 15 inches above homeplate and the base lines. The mound should be turtle-backed, rather than allowed to drop off abruptly at the edge of the mound. The infield area should have a one-percent grade from the mound to the base lines. The outfield should be graded to a one-percent slope from the center in all directions.

Since the high center crown of football fields makes side shots in soccer difficult, it is not advisable to use the same area for both fields. Soccer fields should not have more than a one-percent grade from the center of the field to the edges.

Athletic fields should be laid out with the main axis running in a north-south direction wherever possible.

Seedbed Preparation

Soils in Arizona vary widely in their physical condition and fertility status. Each situation must be considered individually. Generally recommendations are helpful but specific conditions may greatly alter these suggestions. It is always helpful to contact someone who is trained and has had experience in construction and preparation before attempting to build an athletic field.

Soil Conditions

As mentioned previously, soil compaction is one of the most common problems encountered in athletic fields and recreational areas. Heavy soils (those high in clay content) compact much more rapidly than sandy soils. Sandy soils, however, have very little moisture and nutrient holding capacity. It is therefore desirable to incorporate the advantages of both into a deep uniform seedbed mixture. A sandy loam soil is preferred, and this can be achieved by adding coarse sand to clay soils, or vice versa.

Organic matter of various types makes an excellent soil conditioner. Peat, cotton seed hulls, manure and well-rotted sawdust work very well. These materials should be thoroughly mixed with the soil to a depth of five to six inches. The amount needed varies with the type of soil. For most soils, 1½ cubic yards per 1000 square feet of area is adequate.

Uniformly mixing any soil conditioner with the soils is the key to its success. Rotary tillers or disc harrows can be used.

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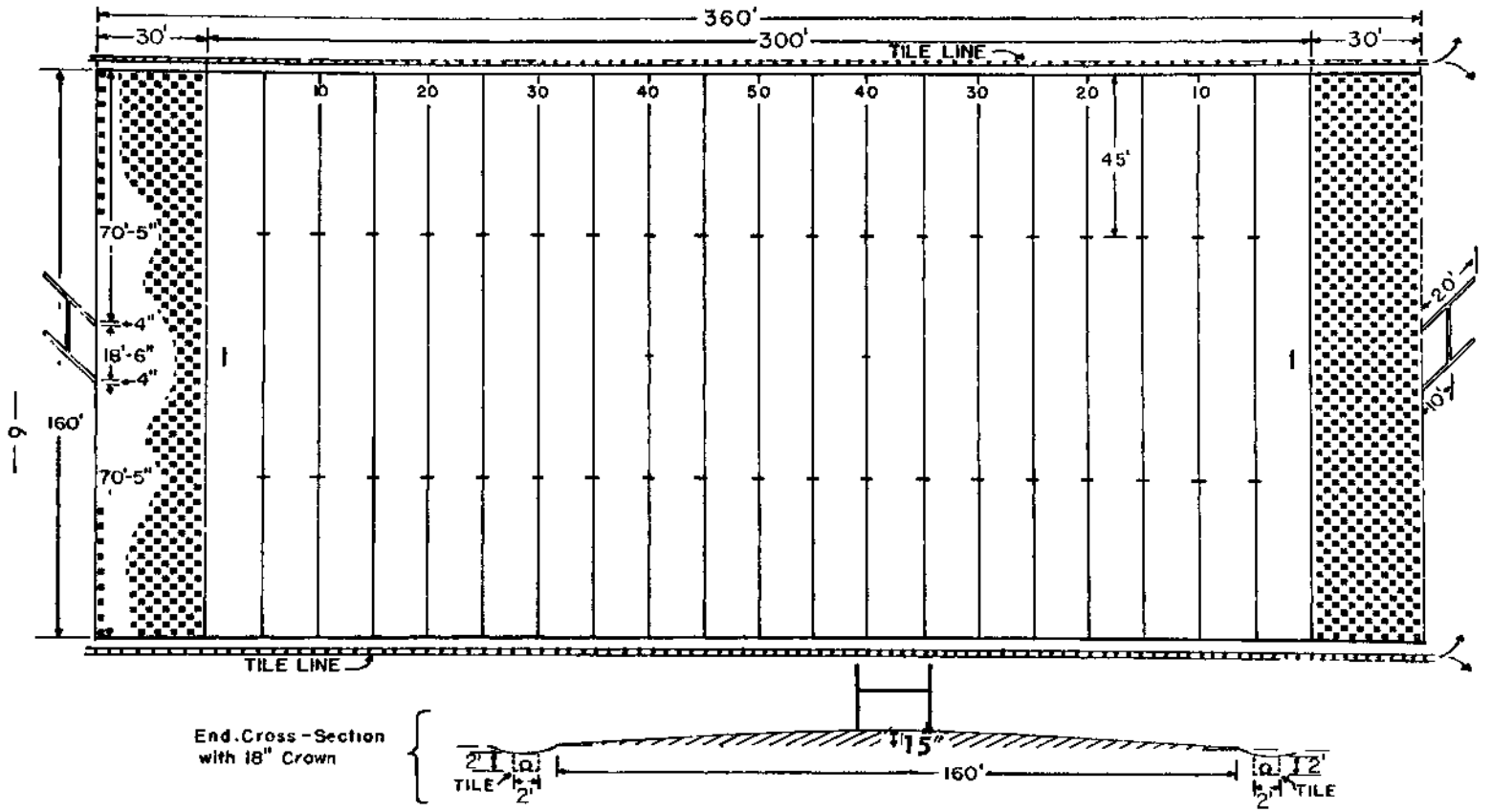

Figure 1. Field Plan of Football Gridiron Showing End and Tile Lines.

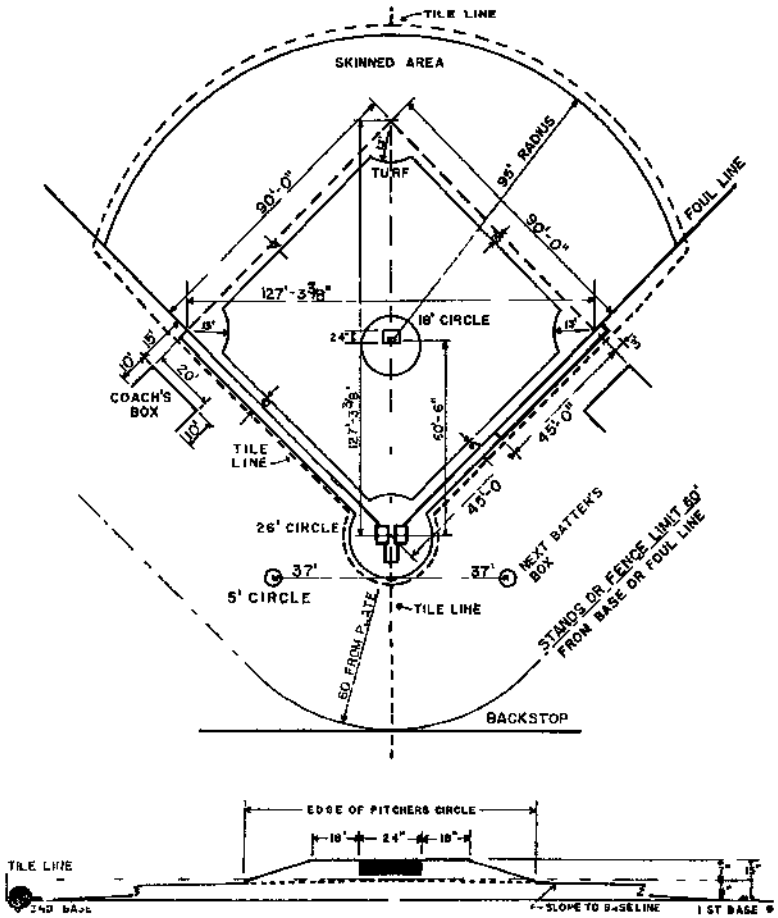

Figure 2. Field Plan of Baseball Diamond Showing Design of Tile System.

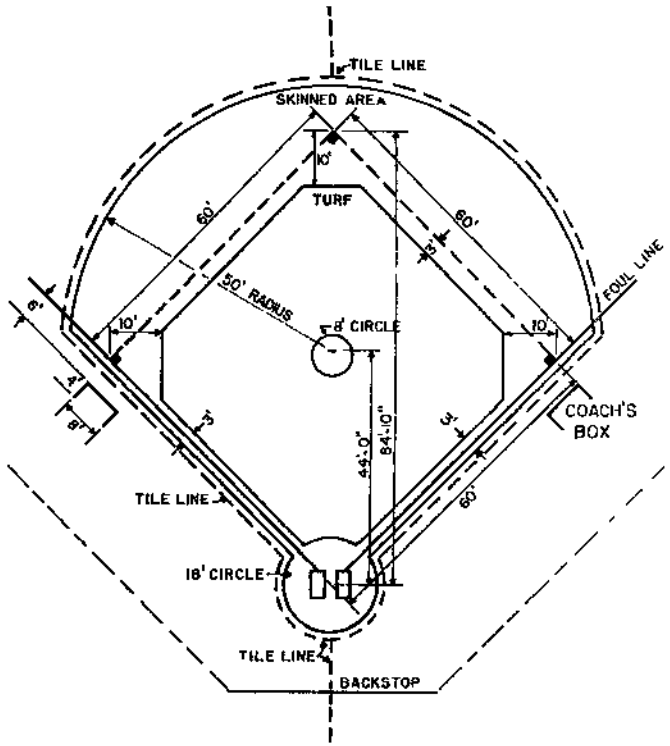

Figure 3. Field Plan of Little League Baseball Field Showing Design of Tile System.

Fertilizers

The most satisfactory method of indicating fertility needs is to have the soil analyzed. All soils in Arizona should be analyzed for pH and total soluble salts before any fertilizers or amendments are added. The local County Agricultural Agent will help in taking the soil sample in the areas and send it to the University of Arizona Soil Testing Laboratory. The agent will also assist in interpreting the report

1. **Phosphorus** — If tests show the need, incorporate 100 to 150 pounds of P_2O_5 equivalent per acre. Generally speaking, enough phosphorus is present in Arizona soils for turf nutritional purposes.
2. **Potassium** — There is sufficient potash native in Arizona soils to eliminate the need for additional applications.
3. **Nitrogen** — Sufficient nitrogen should be added to aid microbiological activity and offset a tie-up of nitrogen by soil organisms. Approximately 40 to 50 pounds of actual nitrogen per acre may be used

The fertilizers used should be applied prior to final grading of the field. They serve as a reserve source of plant food.

The necessity for deep mixing of these materials is obvious because the mineral plant food elements move very slowly in the soil with the exception of nitrogen which leaches quickly. By placing the material deeply prior to establishing grass, the plants are provided with a readily available supply of food. This promotes deep root development.

Starter Fertilizer

In addition to the above mentioned reserve fertilizer, a nitrogen "Starter Fertilizer" should be used. Use a nitrogen fertilizer in which half of the nitrogen is readily available and the balance available over a period of 4 to 6 weeks.

This fertilizer should be applied prior to seeding at a rate to supply approximately 40 to 50 pounds of actual nitrogen per acre. It should be raked into the upper two to three inches of the surface and should be moistened once or twice before seeding.

Seeding, Sodding, or Sprigging

Usually seeding or sprigging, depending on the type of grass used, will be the logical choice. Either one is less expensive than sodding, with the same grass variety.

New seedings of cool-season grasses should be given at least six months, preferably longer, to become completely established before heavy traffic is permitted on the field. Warm-season grasses which have been sprigged will require 2 to 3 months before ready for hard use.

If play is to begin soon after the field is completed, sodding may be the only choice A good sod, properly placed and managed, will "knit" and be ready for use in four to six weeks.

Sod, rather than seed, should be used for patching thin or disturbed areas unless the field can be kept out of play for several weeks.

Seedbed preparations for sodding should be the same as for seed or sprigging.

Which Grass to Use

The grass best suited for a given field depends largely on location within the state and season of heaviest use.

For the areas of Northern Arizona, cool-season grass varieties should be used regardless of seasonal usage.

In Southern Arizona areas, warm-season grasses are the logical choice. When the traffic is rather uniform during all seasons of the year, a warm-season grass should be the permanent grass and this overseeded with an annual cool-season variety or dyed in the fall, if a green color is needed in winter.

Cool-Season Grasses

1. Kentucky Bluegrass	**100%**
2. Merion Kentucky bluegrass	**40%**
Common Kentucky bluegrass	**40%**
Red Fescue (Pennlawn preferred)	**20%**

2-3 lbs. of the mixture per 1000 sq. ft.

This mixture should be used only for highest quality turf areas where intensive management is provided.

3. Annual Ryegrass	**100%**

Seeding

For best results, cool-season grass varieties should be seeded in late summer or early fall. Very early spring is the second best time.

If it is necessary to plant during the late spring or summer, sod should be used. Or a temporary grass such as annual ryegrass may be planted, then the area reworked and planted to permanent grasses in the fall.

Buy only the highest quality seed which is free of weeds and annual bluegrass (Poa annua). Good germination is essential. The percent of germination shown on the seed tags for bluegrasses and fescues should be at least 75 and 85 percent, respectively.

For more information on seed quality and germination, ask the Extension Agent in your county for "Lawns for Arizona," Bulletin A-6.

Mulching

Mulching with straw or other similar materials helps new seedlings by preventing erosion and preserving soil moisture. Weed-free grain straw should be applied evenly at the rate of one bale for each 1,000 square feet of area.

A new material known as wood fiber cellulose can also be used, but special equipment is needed for its application. Well rotted manure is satisfactory at rate of 1 cu. yd. per 1000 sq. feet.

Fertilization

Heavy seeding rates and heavy fertilization are essential for maintaining a thick, uniform stand of fescues. To be sure of fertilizer needs, have your soil analyzed.

Generally, about 6 to 8 pounds of nitrogen fertilizer per 1000 square feet are needed per year for tall fescue. Three to four pounds should be applied in the fall as a complete fertilizer, two pounds in the spring, and the remaining one to two pounds in several light applications during the summer.

When using soluble nitrogen sources, do not apply more than one pound of nitrogen per application. Water it in immediately after it is applied.

If slowly available sources of nitrogen are used, slightly higher rates should be applied but fewer applications will be required. Use slightly less fertilizer for bluegrass turf.

Mowing

Fescues and bluegrasses should be mowed at 1½ to 2 inches above the soil. If it is necessary to mow at a lower height, supplemental irrigation, extra fertilizer, and very intense management must be provided. These grasses should not be mowed lower than 1¼ inches, or failures can be expected.

Grasses normally cut at 1½ inches should be mowed before they reach a height of about two inches. As a general rule, no more than one-third of the green-leaf area of the grass should be removed at one time.

If the grass is permitted to grow taller than the usual height, cut it back to its regular height gradually, not at one clipping.

Warm-Season Grasses

Varieties which may be considered for recreational areas include the following:

U-3 Bermudagrass is a variety that is more winter hardy than other commercially available Bermudagrass varieties. It spreads rapidly and produces a thick high quality turf that is very resistant to wear. Heavy fertilization, especially with nitrogen, is required to keep it growing vigorously. Weeds and diseases are seldom serious problems.

Common Bermudagrass spreads very rapidly, is much coarser than U-3, and is less winter hardy. Seed of certified common Bermuda can be purchased in Arizona. Other improved hybrid varieties of Bermuda such as Tifgreen (328), Tiffine (57) and Tifway (419) have been developed for use in the Southern areas.

Zoysias, either Meyer (Z-52) or Zoysia matrella, may be used under certain tain conditions in Arizona, but because of their very slow growth habit and tendency to accumulate thatch, they are not generally recommended.

Planting

Almost all of the warm-season grasses except common Bermuda, must be planted from vegetative material — sprigs, plugs, or sod — since they do not produce seed. They should be planted in May or early June to take advantage of the entire summer growing season. Bermudas and zoysias usually start growing in May, slow down or stop growing in September or October, and then turn brown with the first heavy frost in the fall.

Bermudas and zoysias should be planted only in full sunlight. This is not a factor in athletic fields but may be an important consideration in other recreation areas.

Fertilization

Bermudagrasses are heavy nitrogen feeders. For best growth, 8 to 10 pounds of nitrogen are needed per 1000 square feet each year. This amount should be applied in equal

monthly applications from May through August or September and watered in immediately. If slow release fertilizers are used, increase the rate slightly but decrease the number of applications. Zoysias require slightly less fertilizer than the Bermudas.

Mowing

Bermudas should be mowed at one-half to one inch above the soil surface. Because of the low mowing height and rapid rate of growth, they will need mowing more often than the cool-season grasses. Vertical mowing or "verti-cutting" once or twice per season helps keep thatch accumulation and long stolon growth (runners) to a minimum.

Overseeding

If an athletic field of Bermudagrass is to be used late into the fall, overseeding with an annual cool-season grass will provide an attractive green color and some protection for the dormant Bermuda. The area should be verticut in late September and overseeded with about 10 pounds of annual ryegrass (not perennial) per 1000 square feet of area. One pound of actual nitrogen fertilizer per 1000 sq. ft. may be applied at the time of seeding.

After seeding, rake or verticut lightly and roll the area to bring the seed into contact with the soil. Keep the area watered until the ryegrass is established. Mow the ryegrass at one inch and fertilize lightly as needed with a soluble nitrogen fertilizer such as ammonium nitrate or ammonium sulfate.

Irrigation

Light frequent watering of newly seeded or sprigged areas is essential. Sodded areas must be wet thru the sod until established. The soil surface should not be permitted to dry out until the grasses are well established.

After establishment, water the turf every week or ten days. At each watering, the soil should be wet to a depth of at least four to six inches. This usually requires the equivalent of one-half to one inch of rainfall.

Avoid watering just before the area is to be used. At least two to three days of drying is needed between irrigation and heavy use, otherwise compaction will result with the wet soil.

Weed Control

Good management which produces a dense vigorous turf is the best method of controlling weeds. However, if certain weeds persist they can be controlled with chemicals.

For the most recent information on chemicals for weed, disease, and insect control see Bulletin A-6, "Lawns for Arizona," or contact your local County Agricultural Agent.

This publication is issued by the Cooperative Extension Service and the Agricultural Experiment Station of The University of Arizona. See your local County Extension Agent for additional information.