Demonstration Concept Works For North Texas Football Program

By Dr. William E. Knoop

For the past seven years, dozens of North Texas high schools have taken part in a football field improvement program sponsored by the Texas Agricultural Extension Service which uses a result demonstration concept.

Through various County Agricultural Agents's offices, Texas schools are provided with the expertise and guidance necessary to upgrade their athletic field maintenance programs. Each demonstration then becomes a teaching tool for other schools in the area.

One of the keys to the success of the program has been the support of the Tennessee Valley Authority (TVA). Not only does the program demonstrate the value of sound maintenance, it is also demonstrating the value of using sulfur-coated urea as a nitrogen source.

This fall there are 37 high school football fields in the demonstration program. The payoff is not only better looking football fields, but much safer fields with fewer injuries.

There is no magic in maintenance of athletic fields. Adherence to the tried and true basic turfgrass maintenance principles discussed below will, if followed, produce a superior field.

Aerification is a major step toward improving fields and a must for fields under tight budgets.

TABLE ONE: FERTILIZER TIMING

Fertilizer Analysis	Nitrogen Source	Application Date	Lbs. N 1,000 ft.	Lbs. Fert. 1,000 ft.	Lbs. Fert. Football Field*
15-5-10	soluble	April 15	1.3	8.7	500
		June 1	1.3	8.7	500
		July 15	1.3	8.7	500
		Sept. 1	1.3	8.7	500
		Total	5.2		2000
15-5-10	50 or	April 15	1.6	10.7	600
	100%	June 15	1.6	10.7	600
	S.C.U.**	Aug. 15	2.0	13.4	800
		Total	5.2		2000
19-5-9	50%	April 15	1.7	9.0	500
	S.C.U.	June 15	1.7	9.0	500
		Aug. 15	1.7	9.0	500
		Total	5.1		2000

* A footbal field is 57,600 sq. ft.
** Sulfur Coated Urea

Mowing

Each turfgrass has an ideal height-of-cut. Since most athletic fields are either common bermudagrass or one of the "named" bermudagrass varieties, there are really only two different heights-of-cut to consider.

The best cutting height for common bermudagrass is about 1-1/2 inches. All the others, such as Tifway (419), Tifgreen (328), or Texturf-10 should be cut in the 1- to 1-1/2 inch range.

Generally, if these grasses are cut below the recommended height they will tend to thin out and be less tolerant of heavy use. At cutting heights much above the suggested height bermudagrass tends to become stemmy. All the leaves are produced near the end of the upright stem and the turf becomes very susceptible to scalping.

Failure to mow at proper intervals can be one of the most abused aspects of turfgrass maintenance. Ideally, a field should be cut at a point when no more than one third of the leaf surface is removed at one

mowing. For a common bermudagrass field, the turf should be cut once it reaches a height of 2-1/4 inches. The named bermudagrasses should be cut when they reach a height of 1-1/2 inches. Generally, this means a field should be cut about twice per week.

Reel mowers offer the best cut in terms of quality, followed by rotary and then flail mowers. Regardless of the type of mower, blades should be kept sharp.

Irrigation

Maintaining a quality athletic field without irrigation in Texas is extremely difficult. Many athletic fields are constructed on soils containing a high amount of clay that shrinks when it is dry and expands when it is wet. During dry periods, many of these fields may develop soil cracks that are several inches across and many inches deep. These non-irrigated fields may not be safe for play.

The frequency and duration of irrigation is dependent on many environmental factors as well as those limitations imposed by design of the irrigation system. Ideally the system should be able to provide enough water over a reasonable time period to wet the soil to a depth of four to six inches. The soil should then be allowed to become nearly dry before the next irrigation.

Since many fields are constructed from high clay soils, it may not be possible to apply enough water in one cycle to wet the soil deeply before water begins to run off. When runoff occurs, stop irrigating and let the water soak into the field. It may be necessary to repeat this type of a cycle several times before irrigation is complete.

Allow the field to dry out until "footprinting" occurs. This is when the plant has a low water content and does not bounce back after it has been stepped on or driven over.

If turf is irrigated too frequently and the surface stays wet for an extended period, it tends to be more susceptible to disease, accumulate thatch, and becomes more shallow-rooted.

Aerification

The roots of a turfgrass plant take in oxygen and give off carbon dioxide. An average soil contains about 45 percent mineral, five percent organic matter, 25 percent water and 25 percent air.

When a soil receives an abnormally high amount of traffic, as do many athletic fields, the amount of air space in the soil is slowly reduced. This results in a gradual thinning of the turf because the soil has been compacted.

Between the hash marks of football fields and the areas near soccer goals are good examples of areas prone to soil compaction.

As the sand content of a given soil increases, it becomes less subject to compaction. Conversely, as the clay content of a soil increases, it becomes compacted more easily.

Since most athletic field soils have a high clay content, it becomes very important to consider the turfgrass maintenance procedure designed to counteract soil compaction-aerification, also known as coring.

Aerification involves use of a machine that inserts a hollow or solid metal tine into the soil to a depth of two to three inches. A core of soil is displaced by hollow tines and discarded on the surface, where it will slowly decompose.

The hole left during this process will allow greater amounts of oxygen to reach the root system and greater amounts of carbon dioxide to escape. These holes also allow freer movement of water, nutrients and pesticides into the soil. Aerification is the only way a soil can be tilled without seriously disturbing the turf.

Every athletic field should be aerified at least once a year. Heavy-use fields and fields that have a thin turf may need to be aerified once a month during the growing season. Once a month aerification is not too often for fields that have a high clay soil.

Fertilization

A good fertilizer applied at the right time is an important part of any athletic

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field maintenance program. For most fields, a 3:1:1 or 4:1:2 ratio of nitrogen:phosphorus:potassium will do a good job. A three- or four-application program is recommended for Texas football fields (See Table One).

Pest Control

Weeds are a very common problem on many athletic fields. Control is based upon classification of the weed.

Grassy weeds include crabgrass, goosegrass, dallisgrass, etc. Herbicides typically used to control grassy weeds are MSMA and DSMA.

Broadleaf weeds include henbit, goathead, etc. The herbicides 2,4-D, MCPP, and Dicamba are often used to control broadleaf weeds. Trimec is a combination of all three.

Many major weeds can be controlled before they germinate with preemergence herbicides (Balan, Betasan, Dacthal, Ronstar, pendamethalin, siduron, etc.). These products will prevent germination of crabgrass, annual bluegrass, and other major weeds for periods of three or more weeks.

Another way to control weeds is during the dormant season. While bermudagrass is dormant, glyphosate (Roundup) can be applied without harm to the bermudagrass and it will kill active weeds. Make sure the bermudagrass is dormant first.

The only insect pest of significance on athletic fields is the white grub. If they are a problem, it is usually after August 1.

Signs of white grub damage include patches of wilted turf that do not recover with irrigation. If more than five grubs are discovered per cubic foot of soil, treatment with diazinon or dursban is suggested. A wetting agent mixed with the insecticide spray will facilitate movement of the pesticide into the soil where the grubs are.

Diseases of bermudagrass are fairly rare. Most diseases of turfgrass require free water or very high humidity to infect a plant. In most of Texas, the humidity is fairly low during the bermuda growing season. One of the best methods of disease control is the proper use of irrigation.

Texas Agricultural Extension Service has a similar program for baseball fields. A description of this program will be presented in the next issue of SportsTurf.

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Editor's Note: Dr. William Knoop is a turf specialist with the Texas Agricultural Extension Service, Dallas. He has spent considerable time working with sports fields in his region and is organizing a sports turf workshop for next spring in Dallas.

TABLE TWO: WEED CONTROL

Weed Type	Chemical	Trade Names
Summer grassy	MSMA, DSMA	Various
Summer broadleafs	2,4-D, MCPP, Dicamba combinations	Trimec, TrexSan
All winter weeds (Spot apply when bermuda is dorman.)	Glyphosate	Kleen-Up or Round-Up