"Athletic Field Reconstruction"

by Dr. Henry W. Indyk

All too often, the blast of an official's whistle signaling the start of an outdoor sporting event brings two opposing teams together on a barren field speckled with ragged tufts of green. Manu of these tufts are the sad remnants of a once-proud turfgrass cover, intermingled with a variety of coarse, aggressive weeds – commonly knotweed, crabgrass and Goosegrass.

In dry weather, the playing surface is hard from compaction, rough from previous activities, dusty from a lack of turf cover and resistant to the penetration of an athlete's spikes or cleats. If it rains a week before the event – or worse, during the event – the surface is slippery, muddy and soft, with virtually no traction. Such conditions give natural turf playing surfaces a bad reputation and stimulate visions of miracle grasses, super products and other surfaces as alternatives. However, criticism of natural turf fields should be aimed at weaknesses in construction or maintenance, but not the limitations of natural turf.

Natural grass has been and will continue to be the best playing surface for a wide variety of outdoor sports and playground activities. Its characteristic resiliency and cushion not only contribute to the enjoyment of a specific sport, but also provides superior footing and reduction in sports-surface-related injuries. These advantages, combined with aesthetic and economic considerations, make natural turf and its management high priorities for sports in the coming years.

Using appearance as the primary criterion for a successfully managed field can be misleading and generate false impressions of natural playing surfaces. Appearance is undoubtedly important, but durability to intensive use under a wide range of conditions is more critical.

Athletic fields proven to be most successful are based upon similar principles in design, planning, construction and maintenance. Failure of these surfaces also is based upon a set of similar mistakes. Failure of natural turf to provide the aesthetics for the spectator and a safe, firm surface for the players can be linked to the following causes:

Improper Specifications

Too often in the original construction of an athletic field, standard specifications are used with little or no regard for the varying conditions peculiar to a specific site. Each proposed site should be evaluated critically before formulating accurate specifications. If this approach is not utilized, there exists a high potential for a field with "built-in" problems that are very difficult or impossible to correct with the best of maintenance procedures.

Enforcement of Specifications

The best of specifications are of little or not value unless construction procedures adhere to the stipulated requirements developed for the site. Too often, construction is allowed to proceed without the "watchful eye" of a knowledgeable individual. Under such conditions, the temptation to bypass ore eliminate critical procedures becomes too great for proper construction particularly where contract responsibilities are awarded to the low bidder.

Improper or Inadequate Maintenance after Successful Establishment

Once a satisfactory turf of properly selected grasses has been established, its future performance depends upon the type and amount of attention devoted to a maintenance program. The investment in establishing a turf cover is wasted unless proper provision is also made for maintenance. A well-planned program should include equipment, materials, personnel, and an adequate budget. In addition, supervisory responsibilities should be entrusted to a conscientious individual knowledgeable in turfgrass management principles and techniques.

Abuse in Field Use

A well-established and maintained turf can withstand a considerable amount of use without serious damage. However, there are limits to the tolerance of turf to continued intensive use. Damage will be most serious where proper construction procedures

have been bypassed, particularly in situations of excessive soil moisture. Under such conditions, use should be curtailed or minimized to reduce the damaging impact on the turf. Decisions of this nature, including the responsibility of determining the intensity of use of the field, should be delegated to the grounds superintendent. *Continued on the next page................*

Provision for Inadequate Facilities

Closely allied to field use is the surging interest in outdoor athletic activities and the resulting increased pressure on existing facilities. Because of economic reasons and/or unavailability of open space for the construction of additional fields, the use of existing facilities is intensified. Most of the existing fields are improperly constructed. As a result, these fields are unable to accommodate more intensive use without exhibiting serious deterioration of the turf cover. As the intensity of use increases, it becomes imperative for the survival and wear tolerance of the turf that the fields be properly constructed.

Inadequate Drainage

The single most influential factor in failure of natural turf fields is inadequate drainage. Poor drainage not only affects the playability of the field, but also has a strong negative influence on eh growth of turfgrass and increases maintenance costs.

Various reasons can be cited for overlooking drainage as a critical factor in athletic field construction. Perhaps the most important is a lack of understanding ore appreciation of the importance of drainage while formulating the specifications for the field or in the finalizing process before submitting for bids. Unfortunately, in many instances, adequate drainage is eliminated or reduced to inadequate by cost-cutters who do not realize the future cost of improper drainage.

In some cases, poor drainage conditions prevail in spite of efforts to improve these conditions. Such failures most likely can be attributed to improper specifications and/or other deficiencies in construction. Some of the common faults of ineffective performance of drainage systems include:

- Provision for Surface Drainage Only. A crowned or turtle-backed field with a few catch basins on the sidelines can facilitate removal of surface runoff, but will do little for improving internal drainage.
- Improper design of the drainage system involving pope spacing, depth, grade and outlet.
- Installation of drainage pipe on improper grade.
- Backfilling of drainage trenches with heavy textured material restricting percolation of water to the drainage pipes.
- Improper physical properties of topsoil above the drainage system. The physical condition of the topsoil is a major factor limiting proper functioning of a drainage system. Soils containing excessive amounts of silt, clay and very fine sand are often used above the drainage system as the growing medium for the turf. Soils of this nature tend to restrict proper drainage due to slow percolation of water. Consequently, during rainy conditions such soils tend to be soft and soggy in spite of a properly installed drainage system. Soils of this nature compact very readily when subjected to traffic. Compaction makes the drainage problem more pronounced. Air porosity tends to be reduced by both moisture saturation and compaction. The situation becomes increasingly complex, resulting in a less favorable environment for proper root growth as reflected in a shallow root system, weakened top growth, reduced wear tolerance and turf deterioration.

Results approaching miracles can be achieved in temporary restoration of improperly constructed or maintained fields. Recent advances in turfgrass breeding have made available superior varieties of turfgrasses, particularly among the Kentucky bluegrasses, turf-type tall fescues and turf-type ryegrasses adapted for athletic fields. These can be effectively established in existing fields by renovation techniques. They include core aerification to relieve compaction and verti-grooving to prepare a seedbed without destruction of grade ore established turfgrasses.

The new seedlings introduced during renovation can be nurtured to a mature, dense turf with adequate provision for lime, fertilizer, supplemental irrigation, mowing and restrictions on use. To fully restore a field in this way, a restricted use period of at least six months is needed. If this amount of time cannot be sacrificed, restoration with a high quality sod can provide instant results.

As impressive and effective as a successful renovation effort may seem, and improperly constructed field will rapidly decline again. Repeated renovation efforts will follow eh same pattern until inherent construction problems are corrected. Reliance on such procedures to overcome initial construction weaknesses will be discouraging and costly.

Natural turf is becoming increasingly recognized as a superior surface for sports fields. However, avoidable failures are a major deterrent to its increased popularity. Failure in recognizing and providing for the factors essential to establish and maintain a satisfactory natural turf playing surface is a sure path to failure. Success, on the other hand, characterized by and aesthetically pleasing surface supportive of intensive use, is a realistic objective. It can be successfully achieved and ensured through adherence to essential basic principles involving planning, design, construction, maintenance and use. ▲

Dr. Henry Indyk is a turfgrass consultant for Turfcon GSI Consultants, Inc., Somerset, NJ. Extension Specialist Emeritus in Turfgrass Management, Rutgers University, New Brunswick, New Jersey. And advisor of SFMANJ.

DID YOU KNOW? The effects of over watering your turf are soil compaction, root deterioration, increased disease activity, increased weed establishment, leaching of chemicals, non-point pollution, decreased playability, less aesthetically pleasing landscape, erosion, wasted dollars and wasted water.