

lue factor contributing to poor quality athletic fields. Inadequate drainage not only affects the playability of the field but also has a strong negative influence on the growing conditions for the turf, contributing to increased maintenance costs.

Various reasons can be cited for overlooking drainage as a critical factor in athletic field construction. Perhaps the most important reason is a lack of understanding of its importance in formulating the field's specifications. Unfortunately, in many instances economic considerations prevail in the decision-making process, eliminating provisions for adequate drainage — a relatively insignificant saving that will prove to be costly.

In some cases, poor drainage conditions prevail in spite of efforts to improve the system. Such failures can usually be attributed to improper specifications or deficiencies in construction. Some of the common faults contributing to inefficient or ineffective performance of drainage systems are:

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 very little to improve internal drainage.

Improper design of the drainage system. This problem involves pipe spacing, depth, grade and outlet.

Installation of drainage pipe on an improper grade.

Backfilling of drainage trenches with heavy textured material that restricts percolation of water to the drainage pipes.

Improper texture 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 commonly used above the drainage system as the ideal growing medium for turf. These soils restrict proper drainage because they slow water percolation.

Consequently, during rainfall the soils become soft and soggy in spite of a properly installed drainage system. These soils also compact very readily when subjected to traffic. Air porosity is reduced not only because of the increased likelihood of moisture saturation but also because of increasing compaction. The result is a less favorable environment for proper root growth that is reflected in a shallow root system, weakened topgrowth, reduced wear tolerance, turf deterioration and eventually a barren athletic field.

Soils containing excessive amounts of fine particles can be improved and made suitable for athletic fields by adding appropriate amounts of sand with the proper texture. The resulting mixture should contain at least 80 percent sand which is predominantly medium textured. Such a soil will drain more quickly and resist compaction.

Increasing recognition of the advantages of natural grass as a desirable playing surface is generating greater interest in proper construction techniques. A concept receiving increased attention involves the use of uniformly graded sand as the soil medium. Different approaches are being used with varying degrees of success in the construction of natural grass athletic fields. Hy-Play Systems, based upon the concept of using uniformly graded sand as the soil medium, was selected for reconstruction of the Los Angeles Coliseum in preparation for the 1984 Olympics. Fulfilling these basic requirements in construction provides a foundation which in combination with proper maintenance procedures is the basis for superior natural grass playing surfaces.

ORGANISMS THAT CAUSE TURF DISEASES

Most diseases of turfgrass are caused by fungi. There are some bacteria and viruses that also incite disease. By and large, they live within the thatch and within the upper levels of topsoil all the time. Most of the time healthy grasses are not greatly affected by the presence of these pathogens. Often when infections occur they are of such minor nature that the turfgrasses recover with only limited injury. However, at other times, weaknesses within the turfgrasses and highly favorable conditions for the pathogen result in disease outbreaks of major proportion. At these times turf damage may be severe.

Unfortunately, by the time the disease is recognized and the pathogen identified, the infection has often run its course, the damage is done and no amount of fungicide can bring back the dead tissue. At best, the fungicide may reduce the spread of the disease.

Any condition that weakens the vigor of turfgrasses predisposes them to disease. It may be:

- too much water
- too little water
- too much fertilizer
- too little fertilizer
- too acid a soil
- too low a clipping height
- too much thatch
- hard, compacted soil — poor aeration
- use of too much pesticide
- a combination of two or more of these.

The most common turf pathogens are described briefly as follows to provide an indication of how they function within the ecological structure of the turf.

Dollar Spot — (*Sclerotinia homeocarpa* F T Bennett)

Dollar spot infection is more likely to occur during moderate temperatures and dry soil conditions. High humidity within the turf is needed to activate the fungus. Low levels of nitrogen in the soil make grasses more prone to infection. Light tan lesions that band the leaf create small patches of bleached turf — less than 3 inches in diameter.

Helminthosporium —

Netblotch — (*Helminthosporium dictyoides* Drechs!);

Leafblotch — (*Helminthosporium cynodontis* Margil);

Leafspot — (*Helminthosporium sorokinianum* Sac);

Melting Out — (*Helminthosporium vagans* Drechs!);

There are several blotch and spot diseases caused by one or more *Helminthosporium* fungi. Infection usually starts in cool, moist weather on lawns that are fertilized with too much nitrogen, irrigated too frequently, and cut at lower than recommended heights. As the weather gets warmer, root rots may develop and the turf

thins out drastically. Usually some resistant plants survive but lawn weeds become easily established during periods of Helminthosporium infection.

Fusarium Blight – *Fusarium roseum* [LK] Snyder and Hans; (*Fusarium tricinctum* [Cda]) Snyder and Hans

Fusarium blight occurs during moderate temperatures of summer whenever the grass is placed under stress. This might be too much water or too little water; too much nitrogen or too little nitrogen. It is often most damaging where the lawn has formed thatch above the soil surface. This fungus infects grasses already weakened and causes the development of tan blotches starting at the leaf tip. These develop into circular patches with some living grass left in the center. The patches are often up to 2 feet in diameter and have a "frog-eye" appearance (dark center and lighter edges).

Brown Patch – (*Rhizoctonia solani* Kuhn)

Brown patch disease develops on turf during warm wet weather. High nitrogen fertilizer predisposes the grass to disease as does excessive irrigation. Lawn areas with poor air circulation have prolonged periods of high humidity. These are especially prone to brown patch. Grass leaves turn light brown in circular patches up to 3 feet in diameter. A black ring of spores is often seen around the outer edge of the circular patches.

Note: Diseases are especially difficult to differentiate by eye and thus in drawings, signs and symptoms are often similar. Laboratory analysis is often the most definitive diagnosis.

UPCOMING EVENTS

Ontario Golf Superintendents Association Field Day University of Guelph / Galt Country Club	June 1
P.R.F.U. Conference (416) 495-4080	June 8, 9
Sports Turf Association Field Day Oakville, Ontario	June 15
Ontario Parks Association Annual Conference St. Catharines, Ontario	July 19 - 21
OTRF Fundraising Golf Tournament and BBQ Woodbridge, Ontario	Aug. 14
CPRCA Conference Hamilton, Ontario	Aug. 14 - 17
GTI/ORF Research Field Day Cambridge Research Station, Cambridge, Ont.	Aug. 24
GTI 2nd Annual Educational Symposium University of Guelph, Guelph, Ont.	Nov. 6, 7
Sports Turf Assoc. / CGSA Conference Metro Convention Centre, Toronto, Ont.	Dec. 10 - 13

OMAF TURF HOT LINE (519) 767-1211

Beginning **APRIL 27, 1989** the OMAF Turf Hot Line will be available to the commercial turf industry. This is a 3 minute recorded message that will be updated Thursdays each week from April to September giving timely information on turf management and upcoming events in the turf industry throughout the season.

MAILING LIST UPDATE

We are currently compiling a mailing list for the OMAF Turf Newsletter. This newsletter will contain information relevant to turf production and management for the commercial turf industry. If you would like to receive this newsletter complete the form below and return it to:

Annette Anderson
Ontario Ministry of Agriculture & Food
Horticulture Department,
University of Guelph
Guelph, Ontario N1G 2W1

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