

Maintaining a Uniform Playing Surface

By Kathleen Conard

Demands are constantly put on sports turf managers to maintain uniform, quality turf no matter what environmental, cultural or financial conditions they encounter. Lack of uniformity on a playing surface can result in serious injuries to players and costly liability for managers and their employers. Maintaining a uniform playing surface is one of the greatest challenges during the summer months since sports turf managers are continually battling the weather, increased disease potential as well as increased play and traffic on fields.

There are many factors to address in order to achieve turf uniformity and effective turfgrass management. The proper application and correct amount of water and turf management chemicals such as fertilizers and pesticides are

critical. Sport turf managers must employ proper watering techniques so plant roots receive adequate amounts of water and turf management chemicals.

It is often assumed that, once water is applied to the turfgrass surface, it will uniformly penetrate the surface and percolate into the rootzone where it is available for absorption by the plant roots. Often water and water-soluble chemicals cannot uniformly infiltrate and penetrate a soil profile. This is normally caused by a condition known as water repellency (hydrophobicity). Hydrophobic soils cause a number of water movement problems that may contribute to other turfgrass problems. Symptoms of water repellent soils can manifest themselves in the form of localized dry spots, compacted turf and the inability for turf to effectively handle environmental stresses (such as drought and excessive heat).

Researchers have also found that, due to the variabilities in soils, water and solutes often flow in unpredictable pathways. This is especially true in water repellent (hydrophobic) soils. Infiltrating fronts of water often become unstable and break into narrow, quickly moving "fingers of flow." Fingered flow patterns of water infiltrate and percolate only a fraction of the soil, resulting in uneven distribution of water and turf management chemicals into the rootzone. This uneven wetting pattern increases the chances of localized dry spots, compaction and inconsistencies in soil conditions.

How do sports turf managers effectively apply water and turf management chemicals so they can eliminate soil inconsistencies and promote turf uniformity? Unfortunately, adding more water usually isn't the answer. However, incor-

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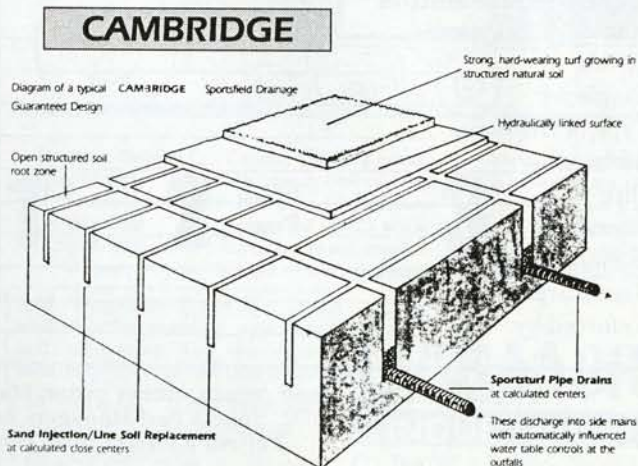
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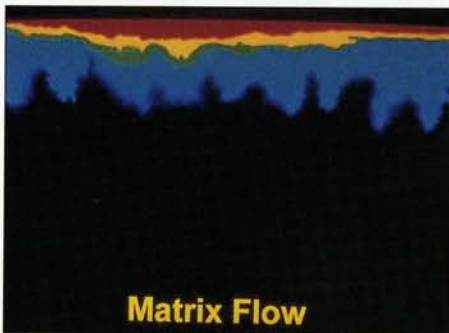
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Fingered Flow

A computer enhanced photo shows "finger flow" water movement through the soil. Photo courtesy: Aquatrols, Cherry Hill, NJ.



Matrix Flow

Computer enhanced photo of the soil shows the even distribution (the "matrix flow") of water that has been treated with a matrix-flow soil surfactant. Photo courtesy: Aquatrols, Cherry Hill, NJ.

porating an effective soil-water management program will increase the chances for uniform movement of water, fertilizers and pesticides.

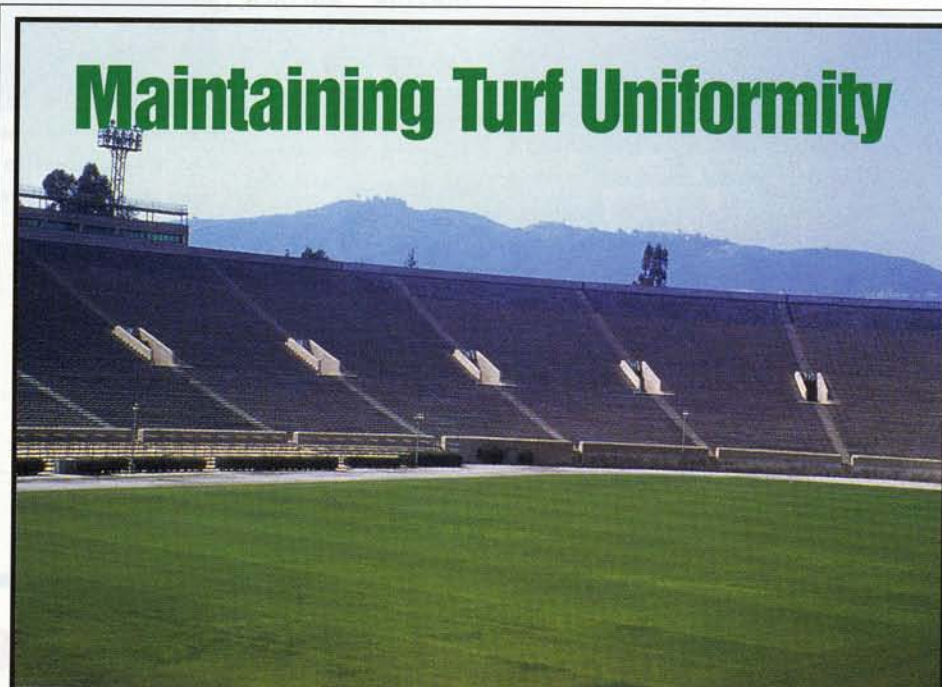
In some cases aerating the turf and/or a deep and thorough watering can help open turf pore spaces, resulting in improved distribution. This may be difficult to achieve when dealing with hydrophobic soils. Vertical mowers and thatch rakes are other devices used to make sports turf surfaces more uniform. Another option is the use of surfactants. Surfactants have been proven to reduce fingered flow and other water-related problems such as localized dry spots, wet spots, compaction and uneven wetting. Surfactants help establish and maintain a "matrix flow" — a downward and lateral water movement flow that ensures uniform movement of water and turf management chemicals throughout the rootzone. Matrix flow promotes healthy turfgrass since water and water-soluble chemicals penetrate deeper into the rootzone. Turf roots grow deeper to reach and utilize the moisture

and nutrients. A deeper root structure means a healthier, denser uniform turf surface. A well designed irrigation system is also a plus. Poor irrigation patterns must be corrected in order to get the maximum effect from a surfactant.

Surfactants have many practical benefits for the sports turf manager, but it is suggested that caution be used when selecting a surfactant. Ask the manufacturer for valid, scientific performance data as well as a list of turf professionals who use the product. Turf professionals

don't usually purchase fertilizers or pesticides without examining the products' credentials, and all other chemicals need to be treated the same.

Sports turf managers who incorporate effective soil-water management practices early in the season can maintain healthy, safe, uniform playing surfaces all season long. Effective, proven soil surfactants will aid in managing soil hydrophobicity and enhance penetration and infiltration of water and chemicals into and throughout the rootzone. □



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