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JB COMMENTS - THE LIVING SOIL

Understanding the concepts of a living soil is important in the construction and culture of a turfgrass root zone ecosystem, in order to maximize turfgrass health and minimize disease and other stresses. A soil can be categorized into the physical, chemical, and biological components. The biological component includes a diversity of microorganisms, actinomycetes, fungi, worms, and insects. The physical and chemical components affect the types and quantities of organisms that compose the living biological root zone system.

High-sand root zones are becoming a necessity on intensively trafficked putting greens, sports fields, and similar areas. The construction is with washed sand and an organic matter source, with both usually lacking in the needed balance of biologically active organisms. There are a number of problems associated with high-sand root zones during the initial 3- to 5-year period that typically are associated with what is essentially a non-living root zone. They include the following:

Root Disease. A disease commonly associated with high-sand root zones is take-all patch (*Gaeumannomyces graminis* var. *avenae*) which is particularly active on roots of creeping bentgrass (*Agrostis stolonifera* var. *stolonifera*). The causal pathogen of this disease is very active on relatively non-living root zones (a) where a biological balance has not developed, and (b) where the antagonist organisms that affect and partially control this causal pathogen have not yet emerged. Typically, the severity of this disease gradually declines in high-sand root zones as the living biological ecosystem develops. This can range from 4 to 7 years, depending on the cultural strategies utilized.

Surface Organic Layer Problem. A properly constructed high-sand root zone is particularly favorable for turfgrass shoot and lateral stem growth. Unfortunately, an active population of decomposer organisms has not yet developed in this relatively non-living root zone medium. Consequently, there is the likelihood that a organic layer may build up on the surface of the high-sand root zone, particularly where excessively high nitrogen fertility rates are applied. It may be necessary to practice mechanical thatch removal techniques, along with a more controlled nitrogen nutritional program involving slow-release nitrogen sources, until a balanced living biological ecosystem develops. Then the rate of organic matter biomass accumulation and its allied rate of decomposition will stabilize.