

MICROBIAL POPULATIONS & ACTIVITY IN TURFGRASS

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Agrochemical use is an indispensable practice in modern society. A well-maintained turf seen on a golf green or a lawn requires the use of some fertilizers and pesticides as a part of an overall cultural program. The widespread use of chemical treatment regimes employed by the turfgrass management industry has caused environmental organizations, citizen's groups, and some regulatory agencies to ask questions about how these chemicals affect the environment. There is often an assumption that environmental contamination caused by agrochemical use in an agricultural situation is also caused by the often visible turf management regimes.

The objective in managing turf is to provide a monoculture of healthy, productive, aesthetically-pleasing grass. Turf presents a habitat much different than that in forage and row crops. Physical characteristics, such as the dense populations of plants with some thatch and an extensive root system contribute to a unique ecology of microorganisms. The health and productivity of a turf is interconnected with that of the soil. The soil microorganisms are perhaps the most important singular indicator and determinate of soil health. Any management regime which negatively impacts the microorganisms acts to prevent achieving the very goal the regime intends to reach: a healthy, resilient turf.

Turf contains populations of microorganisms that have exceptional abilities in utilizing a variety of agrochemicals that are applied to the turf as food sources. These chemicals are directly or indirectly broken down by the microorganisms in a series of steps that often result in the production of water, carbon dioxide, some inorganic compounds, and more microorganisms. Repeated applications of the same or a similar chemical to the turf can enhance the microorganisms able to utilize the chemical as a food source. Microorganisms found in the presence of roots — an area known as the *rhizosphere* — are more active as well as more numerous — a phenomenon known as the *rhizosphere effect*. The extensive root system of a healthy turf thus supports many more microorganisms which are much more active than those found in an agricultural situation.

This project provides a unique opportunity to examine the effects of turf maintenance programs on the soil microorganisms and their activities. These studies will serve to support current maintenance practices or recommend alternatives as appropriate.