

## *Biologicals and organic/natural products —*

# Soil microbial enhancement

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Superintendents that would like to incorporate the use of biological enhancement into their management programs will find it difficult to find empirical data to guide them. There are more companies everyday claiming that various combinations of bacteria, organic amendments, bio-stimulants and other bugs in a bottle will solve most of the problems associated with the management of fine turfgrass.

The most common claims are:

1. Thatch reduction
2. Disease suppression
3. Nematode control
4. Control of black layer
5. Sodium reduction-increased percolation
6. Increased nutrient availability, especially nitrogen
7. Improvement of irrigation water quality

The chance of these benefits without the use of chemical applications or mechanical manipulation sound too good to be true... and they are. We have all been around long enough to know that there is no easy way to manage turf at the level we maintain today. When the water injection aerifiers arrived, they were never meant to replace core cultivation, and the increased effectiveness of growth regulators is not likely to put mower manufacturers out of business soon. These new developments are tools to be used in conjunction with the tried and true methods that experience and science have proven effective over the years. The use of biological agents to improve the health and

quality of our turf should be viewed the same way.

These techniques can only be effective if they are part of a truly integrated plant management system. The difference between the use of organic materials and biological agents, and the other techniques mentioned is that they have been in use for many years. Where a plant is growing in its native environment and is not subjected to artificially induced stress, this is the normal equilibrium of the rhizosphere, and the application of fertilizer and pesticide is not necessary. In turf management, we generally give the plant the opposite conditions, subjecting it to unnatural soils and demanding quality at the expense of resistance to stress. The goal that we are pursuing at Emerald Dunes is to modify the soil environment to make it the most efficient natural growth medium for the turfgrass. The practical results of these efforts are hoped to be an increased ability of the plant to resist debilitating stress factors under normal growing conditions.

While there is not a lot of available research on the use of plant growth rhizobacteria (PGPR) on turfgrass, there has been work in this area as early as 1890 in regard to agricultural crop production. Studies were done first in Russia and Eastern Europe with inoculating seeds with cultures of bacteria to improve plant growth. Work in this area progressed into the 1970s in India and the U.K. with the introduction of bacteria into the growing medium in the greenhouse and positive results were observed on growth promotion.

In Australia however, field trials using the procedures showing success in the laboratory did not produce the same results.



## Practical Application I – Seminole Golf Club

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As with a lot of golf course superintendents, I have been experimenting with various “materials” in hope of finding a way to reduce the need of applying various chemicals and fertilizers to the turf. Humic acid is a great example. Just ten years ago, this product was probably not used very much. Today, I know many superintendents that use humic acid in combination with topdressing or through direct spray applications. The concept behind humic acid is that it allows the bermuda plant to be more receptive to taking in needed nutrients, which in turn allows for higher efficiency.

In line with this concept, I have also been experimenting with the injection of microbial bacteria and nematode suppressing materials through our irrigation system. Again, the idea behind the

use of these “materials” is that they supposedly enhance nutrient release from fertilizers, improve soil structure and water infiltration, suppress disease and nematode activity and reduce thatch.

But in reality, what does all this mean? The bottom line is that — to date — I cannot dispute or verify any of the claims these products make. I have not witnessed any great change in our turf that I can definitely state is a result of these “natural” products. But what I do know is that we have moved into a new environmental age. As a result, probably more and more “natural” products will be introduced into the market in the near future. Time will tell what does and does not benefit the turf. But, if successful, the concept of using “natural” products to reduce chemical and fertilizer use is excellent. I hope that in time these “natural” products prove successful and reduce some of the stress on the golf course superintendent.

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