24/7 natural turf maintenance

Supporting the microbial life within the soil

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Growing chemically-managed sports turf in an artificial sand environment can stress the grass and turf manager in almost equal measure.

Plants will not grow without soil microbes, but sports turf rootzones often lack one or more of the microbial groups essential for healthy growth. Many of the chemical and physical processes employed by turf professionals today are effectively 'papering over the cracks' and masking the unhealthy symptoms associated with chemically managed grass, grown on relatively sterile rootzones.

Disease, thatch, dry patch, compaction, black layer, poor germination and rooting, nematode infestation, Poa annua invasion, high fertiliser requirement and poor drainage are all caused by a biological imbalance in the rootzone. These problems can be solved or alleviated by creating the correct balance between the biology, chemistry and physics in the rootzone. Biology drives the physics and chemistry in natural soils, creating friable, disease-free rootzones rich in humus to support healthy grass growth.

An example of a 10-year-old USGA specification rootzone managed chemically with reduced aeration and soil exchange showing thatch build up and compacted soil

The aim of reintroducing naturally-occurring soil microbes, and the biostimulants that keep them alive and active, is to recreate, as far as possible on a sand-based rootzone, natural conditions for grass growth, thus solving or removing the problems greenkeepers have to manage on a daily basis.

There are five main types of soil microbes – bacteria, actinomycetes, fungi, protozoa and nematodes.

Symbio launched its first microbial products BLT and Green Circle for black layer treatment and nutrient retention in 1992. Symbio Thatch Eater followed in 1993, Mycorrhizal Seed Coat and Inoculant in 1998, compost teas in 2003 and Liquid Aeration in 2008. Each product has been constantly improved over the years as new microbes become available in commercial production

Symbio maintains a database of the conditions, results and feedback from over 1,000 customers throughout the UK and Europe from Iceland to Greece to constantly refine and improve upon the benefits of creating and working with healthy rootzones.

Skilled greenkeepers can produce fantastic results using modern chemical and physical management, but the job is much easier if you have natural processes removing thatch, feeding the grass, improving drainage and fighting disease.

Improvements to rootzone and grass health at Knutsford before and after (right) the switch to biological management

Humus rich, healthy 105-year-old green at Strawberry Hill after five years of applying microbes and biostimulants

What do soil microbes do?

- Bacteria recycle and solubilise locked up nutrients making them available for plant growth
- Bacteria, protozoa and nematodes convert the proteins and carbohydrates produced by photosynthesis back into plant food
- Fungi and actinomycetes degrade thatch and convert it to plant food and humus for a fast draining, friable rootzone
- Microbes employ four separate mechanisms to combat plant diseases and keep parasitic nematodes in check.

Greenkeepers benefit from biologically active rootzones in many ways:

Disease prevention

Tens of thousands of bacteria and fungi live in the soil and most protect the grass against disease. They produce toxins that kill fungal pathogens, they use up excess nutrient that can feed pathogens, some eat pathogens and if the bad guys do get close to a target, plant microbes form a protective barrier around the root system. This is why many Symbio customers more than halve fungicide use within a few months of creating healthy microbially rich soil.

Thatch degradation creates friable rootzones

If fungi are not present, thatch builds up and has to be removed physically. Fungi degrade thatch, converting it to mostly inorganic humus. Humus is the foundation of healthy soil, creating root zones that are high CEC nutrient retaining, friable and fast draining but water retentive, with the correct balance between air, water and soil particles. Symbio Thatch Eater converts thatch to humus and nutrients, reducing the need for invasive hollow coring and heavy topdressing.

Perennial grass growth

Unlike Poa annua, perennial grasses need a healthy population of soil fungi and mycorrhizal fungi to grow. If you lose perennial grasses to Poa annua you know the fungal population in your rootzone is too low.

Nutrient retention and recycling

Bacteria retain and recycle nutrients and when eaten by protozoa and nematodes convert root exudates into ammonium and nitrate. Mycorrhizal fungi solubilise and make nutrients locked up in the rootzone available.

Microbes degrade thatch and unlock nutrient for plant growth. With nutrients made continuously available, you get more constant, natural growth without the boom and bust cycle of occasional fertiliser inputs.

Each soil microbe needs different biostimulants to keep them alive. Humic and fulvic acids, various types of seaweeds, complex and simple carbohydrates, liquid aeration, chitin, potassium silicate and organic fertilisers all produce different reactions to the plant and soil biology.

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