

Naturally-occurring soil bacteria are now emerging as the unsung heroes of fine turf management. We go in search of more information by...

Digging deeper

Research has revealed that promoting populations of certain organisms can enhance natural disease control and improve the texture and fertility of the soil.

But with many existing chemical treatments working against, rather than in harmony, with these organisms, it is possible that applied chemicals can complement natural disease control.

In the case of the soil microflora - or the population of micro-organisms within the soil - it is now recognised that manipulating these can produce a beneficial effect on the turf.

"Beneficial soil organisms can be broadly divided into two groups," said Geoff Yelland, of Rigby Taylor.

"Some bacteria are antagonists, either producing antibiotics which restrict fungus-causing diseases such as fusarium patch or competing aggressively with them for nutrients. Others assist in the breakdown of organic matter into

simpler forms more available to the plant.

"Bacteria which inhibit disease are of particular interest as many products on the market control the disease but also kill these bacteria, causing an imbalance in the soil's natural defences. This can reduce the efficacy of the product and sometimes cause visible damage to the grass."

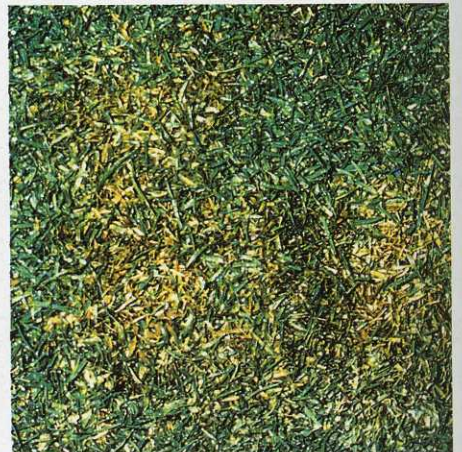
But how do soil bacteria levels stack up in greens and on fine turf?

University research recently undertaken has shown that levels were, on average, 4000 times lower than those in natural grassland.

This raised a number of important questions, such as why, how could this be remedied, and how could healthy soil bacteria populations be maintained?

One reason for the low populations on golf courses in particular appears to be the specification of many modern greens. Sand constructed (USGA) greens seem to contain very few bacteria due to their sterile nature. This is also the case in compacted, poorly aerated and waterlogged areas.

Effective cultural practices boost bacterial populations by creating an environment which favours their development. Some greenkeepers and groundsmen have been attempting to enhance this through the surface application of products designed to promote the growth of soil bacteria. These tend to contain natural compounds and aim to provide conditions which favour the colonisation and growth of beneficial organisms, provided the soil



conditions are appropriate.

Fungicides are a valuable tool for the greenkeeper in turf disease management.

It is important that the use of these products has minimal adverse effects on desirable micro-organisms.

One of the manufacturers of turf fungicides to have researched the wider effects of its products on ecosystems is Dow AgroSciences. The company has conducted tests on Rimidin (fenarimol), its amenity fungicide, to assess its effects on soil bacteria.

Not surprisingly, the company has been keen to announce its findings that Rimidin is not harmful to soil bacteria. "We realise the benefits of soil bacteria and have been working on how to accommodate this with a continuing need to control fusarium on greens," says Dr Mike Drinkall from the company.

"The end result has been the development of a product which is very effective on fusarium, kind to the turf but also harmless to beneficial soil bacteria, which increase Rimidin's efficacy against disease."