

# The Effects of Soil Biology on Nematodes

Nematodes - also called roundworms or eelworms, are mainly microscopic with smooth bodies and range in size up to 1.5 mm long. They are, in fact a natural component in soils and are often present at 200-400 per gram of topsoil.

Most people think about nematodes as being 'bad' but this is not the case, in fact there are in fact five **(5) functional groups of Nematodes** and the majority of them are beneficial, playing an important role in the soil complex. Like soil biology however, it's a game of balance, and when things get out of balance (which occurs through the use of soil altering chemicals) the parasitic nematodes can become dominant and cause serious damage to plant roots.

The Nematode groups include; **1) Fungal** feeders (which eat soil fungi), **2) Bacterial** feeders (which eat soil bacteria), **3) Switchers** (which prefer soil fungi unless there isn't enough, then they'll turn their attention to roots), **4) Predatory** nematodes (which eat other nematodes and Protozoa, and maintain the balance, and **5) Root feeders** (which preferentially feed on plant roots). When the soil system is in balance the root feeders perform a useful task cleaning up and recycling dead and decaying plant material, but when they dominate the population they can cause serious root damage.

There a number of factors that can upset the soils' biological balance and lead to a problem with nematodes. One of the primary concerns is reflected in the vast majority of biological assays we have performed, and that is a significant depletion of fungal resources from the soil. From a nematode management perspective this translates into a desperate lack of food for group 1) the Fungal feeders (which will be low or non existent, and it also means that group 3) the Switchers will be looking at plant roots for a feed. The natural levels of fungi are severely impacted by the continual use of fungicides, herbicides and fertilizers.

The most common response to nematode damage is to treat the soil with strong nematicides, which can give short term relief. Unfortunately though these chemical have quite a severe impact on the beneficial nematodes and other beneficial soil biology including soil fungi. The loss of soil fungi leads to a loss of soil structure and anaerobic soil conditions which are preferred by the root feeders. The culmination of these impacts creates an environment where the root feeders are able to return with little or no competition and thus becoming even more dominant and causing more damage than before.

Building soil fungal levels and inoculating with quality materials that contain beneficial nematodes will help get this balance back into shape. Improved soil biology will also build soil structure and aerobic conditions, as well as provide an important food source for fungal feeders and switchers.