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Soil Foodweb Canada

➤ Newsletter ◀

News and Views from our Laboratory & Learning Centre

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It's Time to Start Fighting Biology with Biology!

With the ever increasing emergence of biological problems on our land, one has to wonder if and when the trend of treating biological problems with chemicals will come to an end. Sadly it seems, for the near future at least, it is only going to get worse.

On a recent trip to Abbotsford for the Pacific Agricultural Show, members of Soil Foodweb Canada attended a variety of seminars regarding controlling clubroot and nematodes in farming production. What was alarming was the focus of the seminars, with a general mentality of "how do we *kill* the problem". The latest chemicals were presented with their preliminary results, and with their costs so high it makes one wonder how anyone could afford to use such things.

There was very little to no discussion as to the fact that since these are biological problems, that maybe we should be trying to use biology, not chemicals, to correct them. Not one presenter talked of setting a better environment in the soil to manage clubroot or parasitic nematodes. But then again, how would our poor chemical companies ever make a profit?

The most disturbing part of all this, however, are the chemicals themselves, with little to no long term research being conducted on them before they hit the market. While BRAND X chemical may be able to kill many species of root feeding nematodes, they have no idea what it will do with all the beneficial nematodes in the soil as well. And the same can be said with BRAND Y chemical for clubroot in regards to fungi.

Without clear data as to the effects of chemicals on all the soil life, one has to wonder why anyone would be willing to risk their farm by masking problems instead of preventing the cause. How long will it be before a different type of root feeding nematode, resistant to BRAND X, comes along? Before clubroot mutates?

How long will it be before we start to fight biology with biology? It needs to be NOW!

The Clubroot Issue - By Dr. Elaine Ingham

Part of the confusion with clubroot is the fact that it is an Oomycete, or a fungus that has protozoan characteristics during part of its life cycle. Some people call it a bacterium while others say it is a protozoan, but this is not correct. No matter what, we need to focus on the parts of the life cycle where biology can help; Setting up a habitat where the disease-causing organisms cannot grow.

The causal agent of clubroot is *Plasmodiophora brassicae* Woronin. In the past, this agent has been classified as a slime mould fungus (myxomycete), but more recently, it is regarded as a protist (an organism with plant, animal and fungal characteristics).

There are normally several different races or pathotypes in established infestations. *Plasmodiophora brassicae* is an obligate parasite, which means the pathogen cannot grow and multiply without a living host. The life cycle of *P. brassicae* is shown in Figure 1.

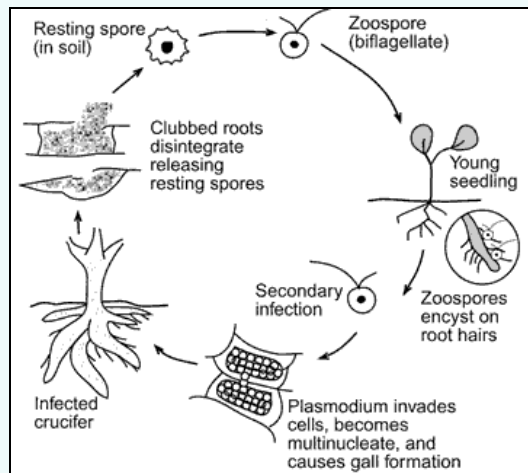


Figure 1. Life cycle of *Plasmodiophora brassicae* the pathogen that causes clubroot.
(source: Ohio State University)

The zoospore stage does best in soil with poor structure, because they can live in reduced oxygen conditions. Build soil structure to get oxygen moving into the soil to as deep as you can, and the problem organisms cannot compete.

Root infection by the disease organism requires that the competing organisms which normally occupy the root surface are not present, or are not growing. Low oxygen, high nitrate, and high phosphate helps the disease organisms and hurts the beneficials. We have to get the beneficials back into the soil so they can build soil structure and are throughout the soil before the roots arrive.

We also need predators that eat the zoospores and hyphae. Yes, there are hyphae, this is a fungus, with some stages that look like protozoa. We need protozoa and nematodes (bacterial and fungal feeders in particular) to eat the zoospores and fungal hyphae.

Welcome William Gaspar!

Soil Foodweb Canada has a new member of our team: William Gaspar.

William will be taking over for our Head Lab Technician Christine George while she is away on maternity leave (Christine and Matthew had another boy on March 30! Congratulations!!!).

Originally from Windsor, ON, William holds an Honours Bachelor of Science Degree in Microbiology from the University of Guelph in Ontario.

We are very pleased and excited to have William working for us and hope you give him a warm welcome the next time you call. Good luck William!

Soil Foodweb Canada Thanks:

Soil Foodweb Canada would like to thank the following organizations and companies for inviting Matthew George to teach for their groups in the last 6 months:

- Kootenay Organic Growers
- Athabasca & District Ag Society
- TLC Animal Husbandry
- Alpine Plant Foods
- Back To Your Roots Soil Solutions

If you are part of a group or organization, such as the ones mentioned above, and would like have Soil Foodweb Canada teach a course, please contact us at: 403-485-6981 or info@soilfoodweb.ca

★ Soil Foodweb Canada Item of the Season ★



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