

# Crop Technology

## Brown Root Rot of Alfalfa in Ontario!

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### Infosheet

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Winter kill" is always a concern at this time of year and 2007 preliminary data suggests brown root rot disease of alfalfa is a new winter kill risk factor for Ontario and needs to be considered when evaluating stands. Brown root rot is not a new disease to Canada and has been present in western Canada since the 1930s. Since 2003, the disease has been confirmed in the many of our neighbouring U.S. great lakes states and the northeast (Minnesota, Wisconsin, New York, Vermont and New Hampshire) and is very likely widespread in the region.

Was this the case in Ontario as well? To answer this question a small survey was conducted in 2007 with the assistance of Michael Wunsch (graduate research assistant) and Dr. Gary Bergstrom (Professor) in the Department of Plant Pathology at Cornell University in Ithaca, New York. We would like to thank both Michael and Gary for including the Ontario alfalfa samples into their brown root rot northeastern US survey.

This summer 10 alfalfa field samples were collected in Ontario starting in the Woodstock/Niagara region to the Ottawa region in the east. These samples were sent to Cornell for processing and identification. Of the 10 samples processed, the brown root rot pathogen (*Phoma sclerotoides*) was detected in 7 or 70 % of the fields. How much BRR was found in these positive fields (incidence) varied from 5% (very low) to 30% (moderate-high) of the roots and/or crowns being infected. Although these results are preliminary they could further support the US data suggesting the disease is widespread in alfalfa production systems in the region but went undiagnosed. The next step is confirmation by molecular techniques of these preliminary results.

What to Look For? As mentioned, brown root rot is caused by the fungal pathogen *Phoma sclerotoides* which thrives when soil temperatures are 15 °C or less and hence, the fungus is most active in the fall and spring when environmental conditions are favourable for infection and the plants are dormant. Infection of the roots and/or crowns can have a detrimental impact on over-wintering health and promote other diseases, winter kill, stand decline and yield loss. Since the fungus also grows very slowly damage is not often noticed until the second or third year when plants become stunted or die. The tap roots, lateral roots and/or crown have characteristic sunken brown lesions (almost black) and in severe cases the tap root is rotted completely. The fungus does not infect the above ground parts of the alfalfa plant.

Since the availability of resistant varieties for Ontario is limited other management strategies such as avoiding late or excessive fall harvest (reduce plant stress going into winter), maintain proper soil fertility and rotating out of alfalfa for at least three years can help reduce losses and increase stand longevity.

These survey results are part of a larger project supported by the Ontario Forage Council which obtained funding through contributions by Canada and the Province of Ontario under the Canada-Ontario Research and Development (CORD) Program, an initiative of the federal-provincial-territorial Agricultural Policy Framework designed to position Canada's agri-food sector as a world leader. The Agricultural Adaptation Council administers the CORD program on behalf of the province.



**Figure 1** - Three-year-old alfalfa plant showing severe rot of the tap and secondary roots caused by brown root rot. Note the dark brown to black discoloration of the lower plant crown and upper root. Photo and description courtesy of University of Wyoming.

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**Figure 2** - Three-year-old plants affected by brown root rot. The plant on the right is dead with the tap root completely rotted, while the plant on the left has a dark brown girdling lesion on the root and was slow to produce spring growth. Photo and description courtesy of University of Wyoming.

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