

Clubroot on canola in northern Ontario

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Clubroot of canola, is an important disease on the Canadian Prairies, and continues to spread in canola fields in northern Ontario, sometimes causing severe crop losses. The disease is caused by a soilborne plant pathogen that produces microscopic resting spores in infected or ‘clubbed’ roots. The spores are released into the soil when the clubbed root rots. The spores can survive for some years and are easily moved to other fields - usually this occurs via infested soil on farm equipment - or if water moves the soil.

The weather conditions this spring in northern Ontario were very good for infection of canola by the clubroot pathogen. Warm ($> 12^{\circ}\text{C}$), wet soils are ideal for infection. In warm wet soils, the spores germinate, the pathogen swims to roots and infects first the root hairs and then the main root. The pH of the soil can be important. Clubroot infection is highest at soil pH < 7.0 , especially 5.0 – 6.5. Vegetable growers often add lime to raise the soil pH to 7.2 or higher to suppress clubroot, but this is likely not practical for most canola growers.

If clubroot is found in your fields or in your neighbourhood, research from the Prairies and in Ontario indicates that a combined approach can be highly successful for managing clubroot. First, growers need to reduce the levels of resting spores in the soil to the point where canola can be grown again. This is accomplished using crop rotation. Then grow only canola varieties with resistance to clubroot. These have ‘first generation’ or ‘second generation’ resistance, referring partly to when they were developed. In general, varieties with first generation resistance have a single resistance gene. Most of the clubroot in northern Ontario can overcome first generation resistance, so using varieties with second generation is recommended.

Approach for clubroot management:

1. Have a minimum 2 -year break from canola and other brassica crops, such as camelina. Be sure to remove volunteer canola and susceptible weeds (weeds in the mustard family such as pennycress, shepherd’s purse etc.) in the fields during those break years.
2. After the break, grow a clubroot-resistant variety. For northern Ontario, this should be a variety with ‘second generation’ resistance, based on testing at the Univ. of Guelph.
3. Plant canola as early as possible. There are many reasons for choosing when to plant, but getting the canola crop growing before the soil is warm enough for clubroot infection can be helpful.
4. Selection of other crops or cover crops: Research has shown that spring wheat, barley and some grass cover crops such as ryegrass, can help reduce the amount of clubroot that survives in soil or moves between fields. This probably also applies to winter wheat, but those trials have not been conducted yet.
5. If clubroot has been found in a field, try to avoid moving any soil to other fields. Cultivating or harvesting an infested field last is one approach to keeping other fields clean.

The canola group led by Prof. McDonald at the Univ. of Guelph can do testing to see if the clubroot organism in a field can overcome first generation resistance. We are interested in working with crop consultants and growers to test clubbed roots from more fields.

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