Interpreting a clubroot soil test result

The results of a clubroot test may look different depending on the lab conducting the test. Some labs offer a "yes" or "no" type of test (PCR) while other tests will indicate the concentration of the pathogen in the soil (expressed as spores per gram of soil: qPCR).

- For a PCR test, a positive result indicates that the pathogen is present in the field. When this occurs, it is important to implement proactive management strategies to keep pathogen levels low and prevent spreading the pathogen to new fields or new areas.
  - o A negative test result means that the pathogen was not detected in the area where the soil was collected. This does not mean that the pathogen is not present any where in the field, due to the limitations of the test and the potential for a false negative.

A false negative occurs when a clubroot soil test fails to detect the presence of the clubroot pathogen in a field where it is present at low levels or only in a small area of a field.

- When the concentration of the pathogen is determined, this can provide you with an estimate of the pathogen level in the field. If pathogen levels are high, this indicates that there is a higher potential for larger yield losses. However, due to variable occurrences of the pathogen in the field and the limitations of DNA-based testing, this information cannot be used to estimate the potential yield loss due to clubroot.
  - o A minimum two-year break (three-year crop rotation) from a susceptible crop or weed species will allow the pathogen population to reduce over time. When pathogen levels are high, greater than 100,000 spores per gram of soil, additional clubroot management strategies are necessary, as crop rotation on its own will not effectively reduce spore levels to a manageable level.
  - o The level of the pathogen may vary over the growing season, particularly when a susceptible host crop is grown. If you use DNA-based soil testing to monitor pathogen levels over time, always collect soil samples from the same location and at the same time of the year.
- It is important to remember that clubroot management needs to be proactive and should include the use of clubroot-resistant varieties in extended crop rotations to keep pathogen levels low whenever the pathogen is present in the field or within the region.

For specific details on sample testing, please inquire with your commercial or provincial diagnostic lab.

Types of DNA Soil Testing

- **Polymerase Chain Reaction (PCR):** PCR soil testing for clubroot relies on the amplification and detection of the clubroot pathogen DNA. This test gives a positive or negative result and can be used to indicate whether or not the clubroot pathogen is present above the limit of detection in the area where the soil was collected.
- **Quantitative Polymerase Chain Reaction (qPCR):** qPCR testing relies on the same basic principles of a PCR test, but allows for the quantification of the amount of pathogen DNA present in the soil sample. The amount of DNA detected is then used to approximate how many spores are present in a gram of the soil tested.

The limit of detection for both PCR and qPCR clubroot tests are approximately 1,000 spores per gram of soil. These tests are not able to differentiate between different strains or pathotypes of clubroot.