

## **Objectives and Rationale**

Apple replant disease (ARD) causes stunting of young apple trees planted on soil previously cultivated with apple. Long-term organic amendments may have potential to prevent ARD. Nursery trees containing ARD pathogens may reduce the benefit of soil fumigation. Objectives of the study are to (i) determine and understand the potential of long-term organic amendments (compost and mulch or only mulch) for preventing ARD and (ii) develop a chemical mix to reduce the risk of ARD inoculum on nursery trees.

## **Methods**

A glasshouse trial was established using control soils (no organic amendment) from seven potential organic amendment orchard trial sites. ARD severity was assessed by determining the percentage relative growth improvement (%RGI) of apple seedlings grown in untreated versus pasteurized soil. A second glasshouse trial used five of these trial sites that had the most severe ARD to determine the ARD suppressiveness of three orchard treatments (control, mulch, mulch + compost).

Apple tree debris were collected from control blocks of two of the organic amendment trial sites. Baiting and qPCR analyses were used to identify *P. cactorum* in debris.

A glasshouse trial was established using soils with known ARD severity to determine mefenoxam and phosphonates dosages that can suppress oomycete ARD pathogens, and if fluopyram inclusion can suppress ARD. The %RGI of seedlings and incidence of oomycetes in roots were assessed. A second glasshouse trial was established that included evaluation of new nematicides (fluensulfone and iprodione).

## **Key Results**

None of the apple debris samples contained *P. cactorum*.

The first semi-selective trial was inconclusive, as the semi-selective mixes that were used caused seedling stunting

The second organic amendment and semi-selective trials will only be evaluated in November 2020.

## **Conclusion and Discussion**

Glasshouse trials are ongoing and there are no results yet to make conclusions. Due to the National Lockdown the project is slightly behind schedule.