

AGR1713: Cover Cropping as Part of a Rotation Strategy to Reduce Pea Root Rot

Aphanomyces and Fusarium root rots were identified as the major root rotting pathogen of field peas and lentils in Alberta and Saskatchewan. Overall, 40-50% of pea fields surveyed were positive for *Aphanomyces euteiches* in 2015-2017, while 70-80% of fields were also positive for Fusarium root rot.

Aphanomyces root rot avoidance by extended rotations away from a susceptible host (peas and lentils) is currently the only management option for Aphanomyces root rots, while available seed treatments either have limited efficaciousness or have not yet been tested extensively under field conditions. The use of biofumigant cover crops, such as *Brassica* spp., as part of a rotation strategy has potential to increase the rate of decay of Aphanomyces oospores, thus shortening the length of time an infested field has to stay out of a pea or lentil crop.

The objectives of this project are to:

- 1) Evaluate the impact of a selection of cover crops on a subsequent season's pea crop's susceptibility to Aphanomyces root rot of pea and on soil health parameters;
- 2) Provide new knowledge on the rate of decay of Aphanomyces and Fusarium inoculum in Prairie soils, with and without cover crops and susceptible hosts; and
- 3) Assess the Aphanomyces and Fusarium inoculum potential of producers' fields where cover crops are routinely grown and determine whether cover cropping practices help soil suppress these pathogens.

To achieve these objectives, a selection of Brassica and other cover cropping treatments were grown at four locations in 2019 and their biomass incorporated onto or into the soil. A pea crop will be grown in these fields in 2020 to determine whether cover crop plant matter influences root rot of pea disease development or pathogen inoculum levels in the soil. Data to be collected include DNA quantification of Aphanomyces and Fusarium inoculum levels in soils, disease levels, soil microbial diversity, soil nutrient properties, and crop yield. Expected results will provide new information on Aphanomyces and Fusarium inoculum dynamics in soils after planting biofumigant cover crops and non-host rotational crops, and on the rate of Aphanomyces inoculum decay in prairie soil over the course of two seasons with and without the presence of host crops and/or biofumigants. The use of cover crops (species, cropping sequence, and management) as an integrated disease management tool for root rot of peas will also be described, while providing information on changes of soil health parameters under different cover cropping management regimes.

After two seasons of a failure to establish cover crops due to extremely dry conditions and an early arrival of fall, a new trial plan was devised for the remaining years of the project to allow for a more successful establishment of cover crop biomass in the trial fields. The establishment and growth of the cover crops in 2019 was successful, and these fields will be sown to peas in 2020 to test for treatment effects on root rot of pea development and Aphanomyces inoculum levels in the soil.