

20/20 Tech Bulletin

What Causes Root Rot in Peas?

Root rot of peas in the Canadian prairies has been a growing concern over the last several years. While root rot can be caused by a number of organisms including *Fusarium*, *Rhizoctonia*, and *Pythium*, *Aphanomyces* has garnered the most attention as the new kid on the block. First confirmed in Saskatchewan in 2012, then Alberta in 2013, it now appears that the pathogen is much more widespread (about 45% of Alberta fields in 2014), suggesting that it has been present for several years. *Aphanomyces euteiches* causes symptoms typical of other root rot pathogens, which is likely why it has been missed up to this point.

Why Does it Matter?

A major reason that *Aphanomyces* is such a serious risk to crops is that, until recently, there have been no resistant varieties, seed treatments, fungicides, or fumigants effective against the pest. The following are registered for use as seed treatments to protect field peas against *Aphanomyces*:

- Rancona Trio (suppression)
- Intego Solo (ethaboxam) (suppression)
- Zeltera (control)

What are the Symptoms and the Life Cycle?

***Aphanomyces* is a soil borne** (not seed borne) water mould that is classified as an oomycete. Infection can happen at any time, but usually occurs during seedling emergence and is favoured by water-saturated soils. The spores are long-lived in soil. Under optimal conditions, symptoms will be seen within 10 days of infection. Root rots interfere with the normal nutrient and water uptake of the plant, resulting in wilting, chlorosis and necrosis of plant tissue above ground. Below ground, the roots of the plant will develop a characteristic caramel colour.

As infection progresses, more spores are produced that will eventually leave the plant, enter the soil and wait for another host to infect. Zoospores may be formed which can swim through water towards plant roots in response to chemical signals released by roots.

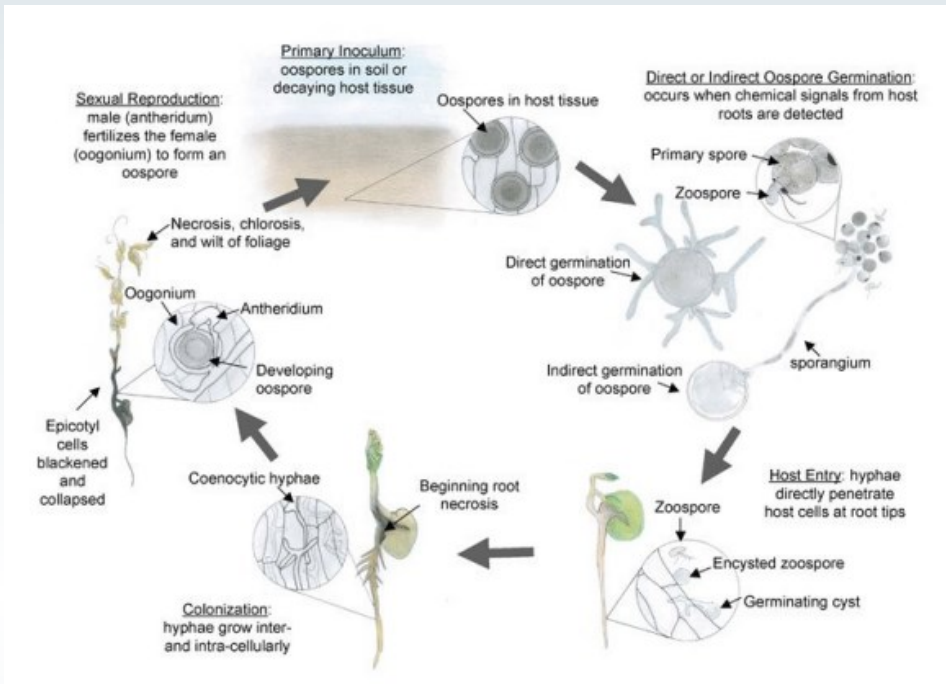


Aphanomyces root rot symptoms in pea seedlings artificially inoculated at 20/20 Seed Labs. Caramel coloured roots are apparent.

Aphanomyces can infect peas, lentils, alfalfa, dry beans, and some varieties of red clover and faba bean but there are differences in susceptibility of crop types.

The spores are long-lived and can survive in the soil for up to 10-12 years, making crop rotations less effective as a tool for managing the pathogen. Before a field is severely infested, crop rotations of 6 years or greater will slow the rate of inoculum build-up.

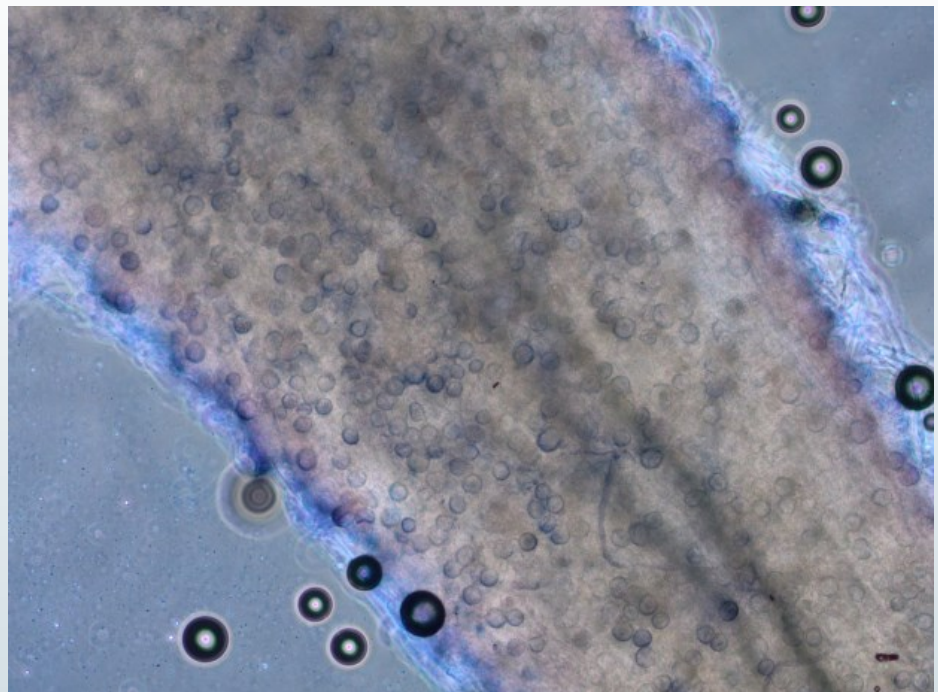
Infected soil can easily move between fields on boots and equipment, so the best way to prevent the spread of the disease is to thoroughly clean equipment between fields, especially after operating in a field with a known infestation.



Aphanomyces euteiches life cycle.

From: <http://www.apsnet.org/edcenter/intropp/lessons/fungi/Oomycetes/Article%20Images/AphanomycesDiseaseCycle.jpg>

Small circular oospores visible in an infected pea root (100x).



***Aphanomyces* is becoming a significant problem** in the prairie provinces with reports of up to 30-50% yield loss in individual fields. To prevent *Aphanomyces* from becoming an issue on your farm you should always test your soil before planting a susceptible host.

At 20/20 Seed Labs we offer a sensitive DNA-based assay that will detect *Aphanomyces* in soil.

Collecting Samples

Soil – “Soil testing is the best preventative method available”

- Sample in a W-shaped pattern at entrances out to a maximum 150 feet into the field. Low-lying points within the field, homestead garden sites, and soil clumps that may have fallen off machinery are also hot-spots for possible pathogen presence.
- Clear all loose organic matter from the soil surface and collect the top 5-10 cm of the A-horizon, or less as the depth allows, without taking any of the B-horizon.
- Submit a minimum 2 cup sample of soil. Air dry and send in a Ziploc freezer bag.

Suspect Plants

- Infected plants are concentrated sources of pathogen, and represent a significant escalation in the amount of inoculum present in a field.
- Scout for suspect plants and submit fresh, frozen or dried roots for testing.

If you suspect ***Aphanomyces* root rot** in your fields and would like to do this test on your soil or plant tissue, please see [How to Submit Samples for Testing](#), or contact us for more information support@2020seedlabs.ca

Finally, ensure to get germination and vigour tests on your seed and only plant seed with the highest rates because seed with low vigour is more susceptible to *Aphanomyces* infection.

Additional References

- American Phytopathological Society Fact Sheet
- Root Rot in Pea and Lentil in Western Canada
- Root Rot in Pulses



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