Powdery Scab in Your Fields: A 2025 Research Update

Project Update: Tracking How Powdery Scab Survives in Rotational Crops and Soil

Potato growers in Alberta are all too familiar with the challenge of powdery scab, a persistent disease that can survive in the soil for years, impacting future crops. Our multi-year research project has been investigating a critical question: where does the powdery scab pathogen go, and how does it survive between potato seasons? This report summarizes what we learned in the second year of the study, as we expanded our sampling and took our first direct measurements of how much of the pathogen is actually present in field soils.

Our Approach: Expanding the Investigation

This year, our research team returned to the same six commercial fields sampled in Year 1, with the help of an M.Sc. student. We collected 60 crop and weed samples (10 per field) to test for the powdery scab pathogen and Potato Mop-Top Virus (PMTV), just as before. We also added a new piece: using a sensitive lab technique called qPCR, we measured the actual quantity of the pathogen's resting spores ("cystosori") in the soil of each field, giving us our first look at how inoculum levels build up or break down over time.

The table below shows the updated crop rotation history for these fields, now including the 2025 season.

Field	2023	2024	2025
Field #1	n/a	Potato (R. Burbank)	Yellow Beans
Field #2	Potato (R. Burbank)	Dill	Winter Wheat
Field #3	Potato (Lady Claire)	Wheat	Seed Canola
Field #4	n/a	Potato (Lady Claire)	Wheat
Field #5	Potato (R. Burbank)	Wheat	Faba Bean
Field #6	Potato (Shepody)	Canola	Wheat

Key Findings This Year

As in Year 1, none of the crop or weed roots we examined showed visible galls, but lab testing again told a very different story.

1. Powdery Scab Remains Widespread in Rotational Crops and Weeds

DNA testing confirmed the powdery scab pathogen (*Spongospora subterranea*) in the roots of every rotational crop we sampled in 2025, yellow beans, wheat, canola, and faba beans, often in 80–100% of samples. The pathogen was also confirmed in a wide range of common weeds, again with no visible symptoms:

- Buckwheat
- Canola (volunteer)
- Kochia
- Lamb's Quarters

- Coriander (volunteer)
- Dandelion
- Dill (volunteer)
- Downy Brome
- Flixweed
- Nightshade
- Red Root Pigweed
- Round-leaf Mallow
- Shepherd's Purse
- Sow Thistle

2. Potato Mop-Top Virus (PMTV) Found Again in Rotational Crops

PMTV, the damaging virus that powdery scab can spread, was detected in the roots of winter wheat and spring wheat this year. As in Year 1, the virus was not found in the above-ground leaves, a reminder that a field can look completely healthy while still harboring both powdery scab and PMTV underground.

3. Soil Inoculum Levels Vary Widely From Field to Field

Using our new qPCR soil testing, we found that the amount of powdery scab pathogen in the soil varies enormously, even within the same field over time. Across the six fields and three years of sampling so far, cystosori counts per gram of soil ranged as follows:

Field	2023	Spring 2024	Fall 2024	Spring 2025	Fall 2025
Field #1	n/a	339	915.2	27.1	27
Field #2	140	1.4	n/a	88.7	13.3
Field #3	146	234.4	n/a	26.4	2.7
Field #4	n/a	999	28.2	n/a	1.2
Field #5	383	4.1	n/a	n/a	5.8
Field #6	260	0.7	n/a	1481.7	0.2

This tells us that a single soil test is only a snapshot, multiple samples across a field and over time give a much clearer picture of a field's true risk.

Meet the Team

This research is now being conducted by graduate student Upekkha Abhayarathne, who is completing her M.Sc. through this project. Over the past year, she has presented these findings at four scientific conferences and symposiums across Alberta, including earning 3rd place in a poster competition, helping share this work with the wider research and grower community.

Long-Term Objectives

This report marks the completion of the second year of a dedicated, multi-year study. Our long-term objectives remain:

- To determine how different rotational crops and cropping years affect powdery scab and PMTV levels in the soil over time.
- To provide growers with science-based, practical recommendations on crop rotation, weed control, and variety selection to reduce powdery scab risk and protect the potato crop.

Over the next reporting period (through 2026), we will continue sampling these fields, testing for PMTV, and analyzing soil inoculum trends to build a complete picture of how powdery scab persists and spreads outside of potato years.

This research summary is part of a project being conducted at the University of Lethbridge under the direction of Dr. Michele Konschuh and supported by the Potatoes Growers of Alberta

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