Powdery Scab in Your Fields: A Year 1 Research Update

Project Overview: What Happens to Powdery Scab Between Potato Seasons?

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. To tackle this issue head-on, a multi-year research project was launched to investigate a critical question: **where does the powdery scab pathogen go, and how does it survive between potato seasons**? This document provides a summary of the key findings from the first year of this research, which focuses on understanding how the pathogen behaves in common rotational crops and weeds.

Our Approach: Sampling Commercial Fields

Our research team collected soil, crop, and weed samples from six different commercial fields, each with a known history of powdery scab. These fields had recently been planted with potatoes, followed by common rotational crops like wheat, dill, or canola. By analyzing these samples, we are beginning to piece together how the pathogen interacts with these non-potato host plants.

The table below summarizes the crop rotation history for the fields studied in this initial phase.

	Plant	
Field #	2023	2024
Field 1	N/A	Potato
Field 2	Potato	Dill
Field 3	Potato	Wheat
Field 4	N/A	Potato
Field 5	Potato	Wheat
Field 6	Potato	Canola

Analyzing these samples has already yielded important initial insights into the hidden life cycle of powdery scab in our fields.

Key Findings the First Year

1. While this is a multi-year study and it is too early to draw long-term conclusions, our first year of data has revealed information about where the powdery scab pathogen (Spongospora subterranea) and the related Potato Mop-Top Virus (PMTV) can be found during rotational years.

Powdery Scab is Hiding in Rotational Crops and Weeds

Powdery scab pathogen can infect the roots of rotational crops and many common weeds without causing any visible root galls. While potatoes develop distinct galls when infected, these other plants can carry the pathogen silently, acting as hidden hosts.

Our laboratory analysis confirmed the presence of Spongospora subterranea DNA in the roots of the following plants:

- In Rotational Crops: The pathogen was found in the roots of all rotational crops studied, including Wheat, Canola, and Dill.

- In Weeds: The pathogen was found in a wide variety of common agricultural weeds, including:

Alfalfa	Nightshade
Brome Grass	Ragweed
Buckwheat	Red Root Pigweed
Crested Wheatgrass	Round-leaf mallow
Dandelion	Russian thistle
Downy Brome	Shepard's Purse
Fall Rye	Smartweed
Kochia	Sow thistle

2. Potato Mop-Top Virus (PMTV) Detected in Canola and Nightshade

Powdery scab pathogen also has the ability to transmit the damaging Potato Mop-Top Virus (PMTV). The project tested for the presence of this virus in the rotational crops and weeds.

Samples found that PMTV was present in the roots of both **Canola** and the weed **Nightshade**. Importantly, the virus was not detected in the leaves of these plants. This again highlights the challenge for growers, as a field can harbor hosts for both powdery scab and PMTV without showing any visible, above-ground symptoms. Managing PMTV requires looking beyond the potato crop and focusing on controlling all potential hosts in the field, including weeds.

Long Term Objectives

This report marks the completion of the first year of a dedicated, multi-year study. Our research team is committed to finding clear answers that will benefit Alberta's potato industry. As we move forward, our long-term objectives are:

- To determine precisely how different rotational crops affect powdery scab levels in the soil over time.

- To ultimately provide growers with science-based recommendations on crop rotation and weed control to more effectively manage powdery scab and reduce its threat to your operation.

To cont this commitment, a dedicated graduate student has now joined the project to focus on this research. We will continue to collect and analyze data over the coming years to build a complete picture of the pathogen's behaviour.