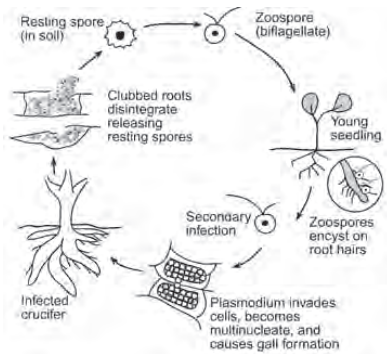


About Clubroot

Clubroot is a serious soil-borne disease of cruciferous plants, such as canola, present in Western Canada and throughout the world.

In canola, it causes swellings or galls to form on the roots, which can ultimately cause premature death of the plant. It is caused by a fungus-like protist called *Plasmodiophora brassicae*.



Clubroot lifecycle

Image source: Ohio State University.

The best way to prevent contamination between fields is to clean agricultural equipment and vehicles which have come in contact with club root before moving to a new field. All contaminated soil, equipment and tools must not be moved to clean, disease-free fields.



Discover our Products for Clubroot Spore Deactivation

More than 125 YEARS of service and innovation

A world leader in the creation of environmentally friendly cleaning products, West Penetone has earned the respect of many industrial sectors for its innovations, expertise and ability to solve the most difficult problems, regardless of the situation.

West Penetone products are used in such varied fields as the food, pulp and paper, petrochemical, transportation, printing, supermarkets and mining industries as well as in aerospace and military.

With its specific challenges and requirements, the agriculture industry requires special attention. Our extensive experience of this environment has earned us an enviable reputation for the cleaning and sanitizing of premises, equipment, machinery and transport trucks.



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Clubroot Contamination

Freeing farm equipment of Clubroot contamination is an important aspect to managing the spread of the disease. Therefore, a means for effective chemical cleaning can be a useful tool for the agricultural industry.

At West Penetone, we engaged the *Crop Diversification Centre of Alberta Agriculture and Forestry* to confirm the efficacy of two of our chlorinated products using Evans blue stain on the rates of Clubroot resting spore mortality with astounding results¹.

One of them is ideally suited for agriculture equipment application as it is safe on soft metals, such as aluminum. Using West Penetone's **PREMISE DEGREASER PLUS** in your decontamination applications versus such standards as generic bleach, you benefit from:

- Increased surface residence time
- Supplemental cleaning
- Reduced rates of corrosion
- Ease of use and application
- Having a product useful for a multitude of applications

Our Clubroot deactivation product also provide efficacy that exceeds many of the disinfectants tested at similar concentrations.



¹.Harding M W, Hill T B, Daniels G C, "Interim Report of Efficacy of Disinfectants Against Clubroot Resting Spores", Alberta Agriculture and Forestry, Crop Diversification Centre South, 2019.

Recommended Product - PREMISE DEGREASER PLUS

Product Information & Use	Features & Benefits
<p>PREMISE DEGREASER PLUS is an industrial strength, highly concentrated, foaming cleaner with added chlorine. It penetrates and lifts a wide variety of soils including oils, fats, grease, proteins, and animal and vegetable deposit.</p> <p><i>Foam-clean all machinery (trucks, ATV's, farm machinery) before and after each field contact.</i></p> <p>TYPICAL APPLICATION*: Follow the recommended 3 steps cleaning in the Clubroot Sanitation Guide from the Canada Canola Council¹:</p> <p>Step 1: Rough cleaning. Wash equipment with a 1 to 3% solution of PREMISE DEGREASER PLUS. Use a hand scraper, wire brush and/or compressed air to remove loose and clinging soil and crop debris.</p> <p>Step 2: High Pressure Rinse. Use a pressure washer at 2,000 –3,000 psi on all areas where soil can accumulate. Turbo nozzles are generally more effective at removing soil than regular nozzles.</p> <p>Step 3: Final Treatment. Treat all openers, tires and wheels with a 10 to 15% solution of PREMISE DEGREASER PLUS, applied with a sprayer. All areas should remain wet with the solution for 15–20 minutes. Step 3 alone is not effective, the first two steps are required.</p> <p>*Applications and concentrations will vary according to location, installations, amount of soil, etc. Consult your West Penetone representative for methods best suited for your environment.</p> <p>¹ https://www.canolacouncil.org/media/530963/clubroot_sanitation_guide.pdf</p>	<ul style="list-style-type: none"> • May be used in cleaning applications requiring >90% rates of Clubroot resting spore mortality* • Contains chlorine in the form of sodium hypochlorite • Moderate alkalinity • High foaming • Solvent-free • Safe on soft metals and concrete • Used in compressed air or manual foaming systems. • Clings strongly to surfaces over a long period of time <p>*Verified by the Crop Diversification Centre of Alberta Agriculture and Forestry using Evans Blue Stain method.</p> 

Efficacy of Premise Degreaser Plus in different concentrations on Clubroot resting spores in solution.

