

Silver Scurf, Phosphorous Acid, and the Fresh Market Experience

Manitoba Potato Production Days 2015

Tracy Shinnars-Carnelley Ph.D., P. Ag.



PeakMarket.com

Overview

- Silver scurf disease cycle
- Symptoms and distinguishing features
- Management strategies
- Post harvest phosphorous acid



PeakMarket.com

Silver Scurf

- A blemish disease caused by the fungal pathogen *Helminthosporium solani*
- A superficial disease that affects the overall appearance of the tuber
- If the infection is severe, the lesions can thicken and crack leading to moisture loss and shrivelling of tubers





POTATOES

lb

Silver Scurf Disease Cycle

- Infected seed tubers are the main source of inoculum
- Spores form on infected seed pieces, then move through the soil by rain or irrigation water, or grow down the stolon to infect daughter tubers
- Soil borne infection is possible if the rotation is very short, but spores typically do not survive longer than 2 years in the soil



PeakMarket.com

Silver Scurf Disease Cycle

- When infected tubers are put into storage, lesions sporulate, producing inoculum for secondary infection
 - RH >90% and temperature >38F
- Spores can also be present in soil brought into the storage, as well as in infested concrete and wood in the bin
- Many disease cycles can occur



Disease Spread in Storage



(Hamm et al., 2013)



PeakMarket.com

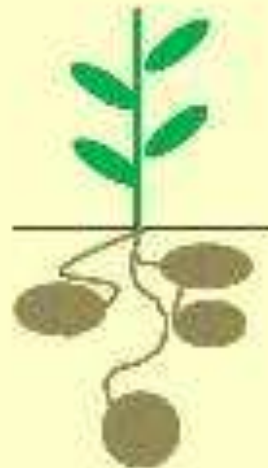
Field Phase

Primary infection



Seed potatoes

Introduced into field



Infection of daughter potatoes

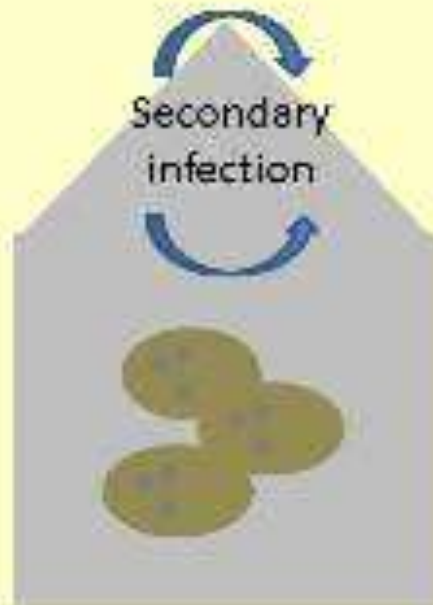


Harvest of infected potatoes

Storage Phase



Placement in storage



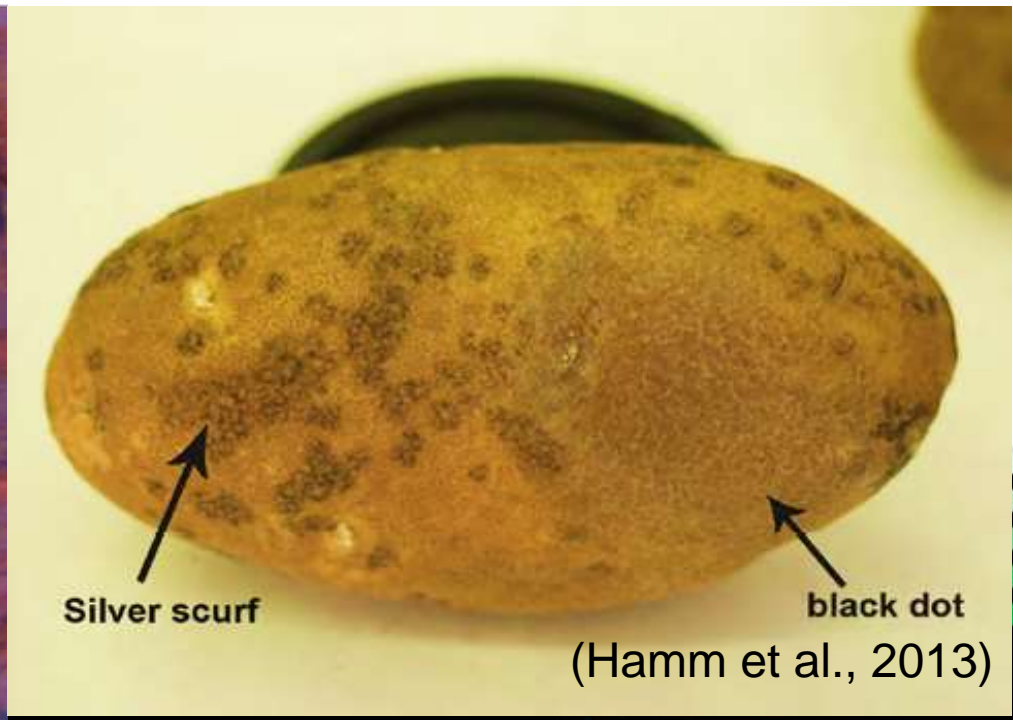
Secondary infection

Infected stored potatoes become seed potatoes for following season



Symptoms

- Circular or irregular, tan to silvery lesions with a definite margin
- Can vary in size from small lesions to patches that cover most of the tuber
- Can be confused with black dot



Management Strategies

- Use seed that is relatively free from silver scurf
- Use a seed treatment effective against silver scurf
- Practice a 3 year (minimum) crop rotation
- Minimize the amount of time tubers spend in the field after the crop has died. This increases risk of infection
- Reduce the amount of soil going into storage



PeakMarket.com

Management Strategies

- Clean and disinfect storages between crops



Management Strategies

- Where possible use storage conditions to reduce disease development
- Cooler temperatures, lower humidity and adequate ventilation can help reduce disease development
- The amount of inoculum, storage conditions, and time in storage will determine the level of disease



PeakMarket.com

Postharvest Treatment

- When interest in post harvest use of phosphorous acid began, there were some reports that it may be effective at suppressing silver scurf
- In 2009-10, a trial was conducted to evaluate the efficacy on silver scurf on smooth skinned varieties



PeakMarket.com

Objectives

- To determine if the post harvest application of Confine and Phostrol would result in:
 - A change in the skin colour of yellow and red potato varieties;
 - The suppression of silver scurf.



PeakMarket.com

Methods

- 4 Varieties:
 - Dark Red Norland
 - Lady Christl
 - Sangre
 - Satina
- 5 Treatments:
 - Control: Distilled water at 2L per 1000kg potato
 - Confine 1X: 2L (1: 4.3) per 1000kg potato
 - Confine 2X: 2L (2:4.3) per 1000kg potato
 - Phostrol 1X: 1.89L (1:5) per 1000kg potato
 - Phostrol 2X: 1.89L (2:5) per 1000kg potato



Methods

- 4 reps per treatment
- 10 tubers per replicate
- Conducted as an on-farm trial and stored in a commercial storage for 5 months
- Removed from storage, hand washed and assessed for skin defects and silver scurf
- Silver scurf assessed 0, 3, and 7 days after washing



PeakMarket.com

Application



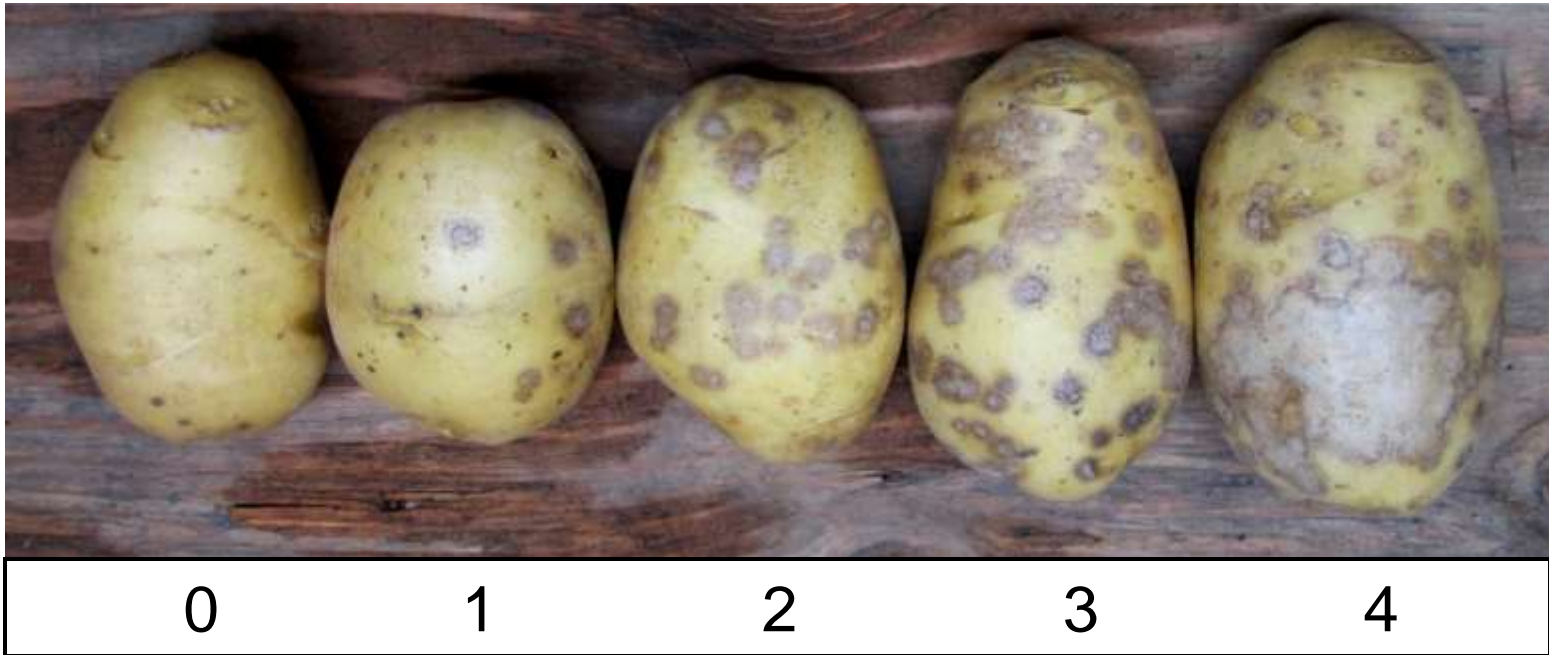
Assessments

- Skin colour



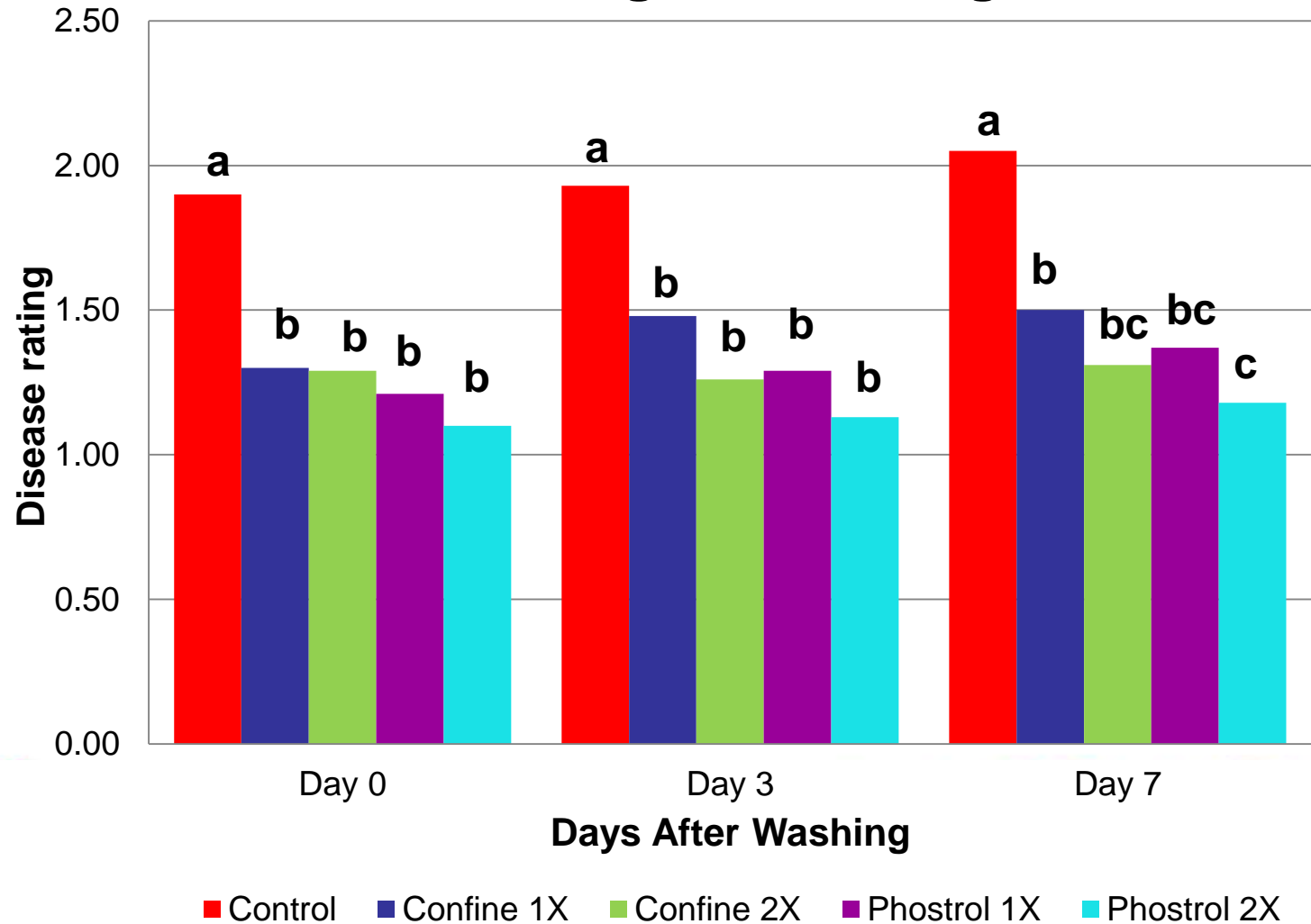
Assessments

- Silver scurf



PeakMarket.com

Silver Scurf Severity on Lady Christl After Storage & Washing



Control



PeakMarket.com

Confine 1X



PeakMarket.com

Phostrol 1X



PeakMarket.com

Conclusions

- Application of phosphorus acid did not result in staining, flecking, or a change in skin colour.
- Lady Christl tubers treated with phosphorous acid had a significantly lower silver scurf rating compared to the untreated control.
- This result was maintained 7-days after being washed.



PeakMarket.com


Decision Making

- Do I use PA?
- What is the best strategy?
 - Foliar? Post harvest? Both?



PeakMarket.com

What is the best strategy?



Post harvest application provides silver scurf suppression, foliar application does not!

Key Messages

- Silver scurf can be managed effectively by:
 - Planting relatively disease free seed
 - Using a seed treatment effective against silver scurf
 - Annual storage cleaning and disinfecting
 - Postharvest application of phosphorous acid
 - Confine is the only PA product labelled for suppression of silver scurf



PeakMarket.com

Questions?

