Centre de référence en agriculture et agroalimentaire du Québec

Comité pomme de terre

Colloque sur la pomme de terre

Une production à protéger

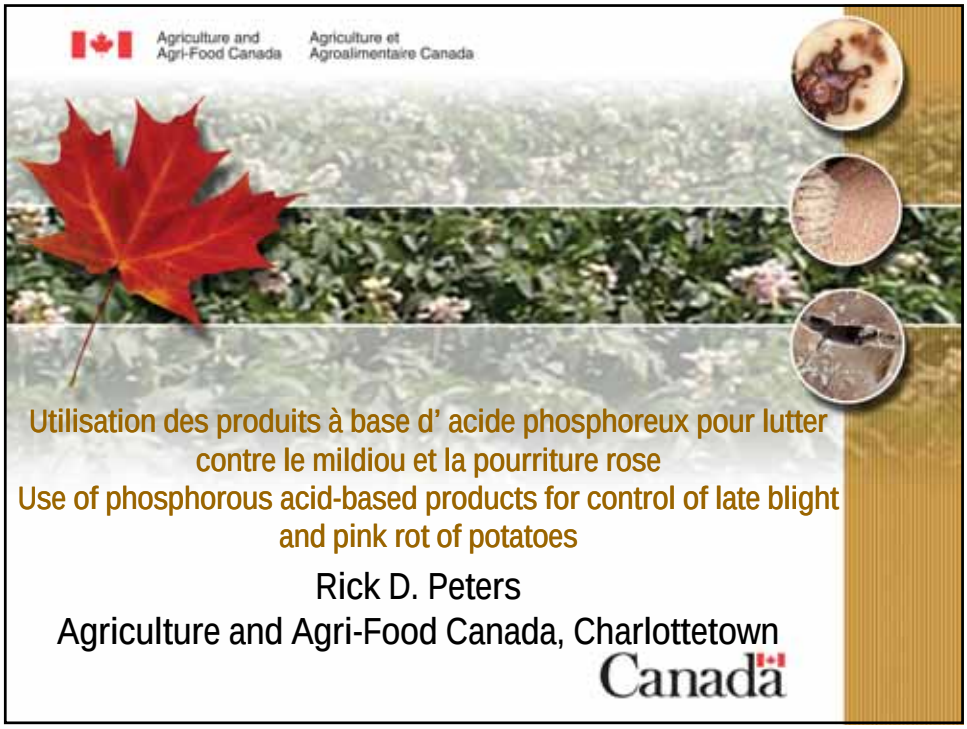
13 novembre 2009, Québec

Utilisation des produits à base d'acide phosphoreux pour lutter contre le mildiou et la pourriture rose

Rick D. Peters, Ph.D., chercheur scientifique, AAC, Charlottetown Île-du-Prince-Édouard

Note : Cette conférence a été présentée en anglais lors de l'évènement et la présentation PowerPoint a été publiée dans le cahier du participant.

Pour commander le cahier du participant, consultez le catalogue des publications du CRAAQ



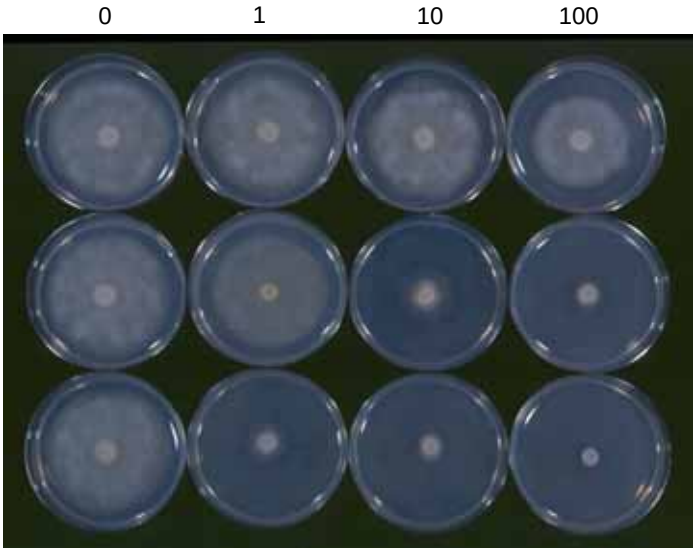
Pink Rot and Late Blight

Phytophthora erythroseptica and *P. infestans*

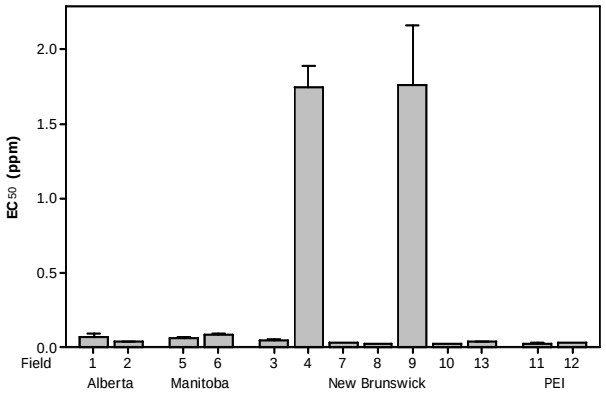
Pink rot

Late blight

Sensitivity to Ridomil Gold (metalaxyl-M)



Sensitivity of *P. erythroseptica* to metalaxyl-M 2005 Canadian Survey



7 resistant isolates (14%) out of 49 isolates collected in total

2007: 2 isolates from Quebec = sensitive
1 isolate from NB = resistant

Late Blight (*Phytophthora infestans*) 2006 and 2007 Canadian Surveys

2006			2007		
MS	MMR	MHR	MS	MMR	MHR
10%	65%	25%	16%	52%	32%

- Predominantly A2, US-8 genotype
- Some exceptions (A1, US-11 genotype)

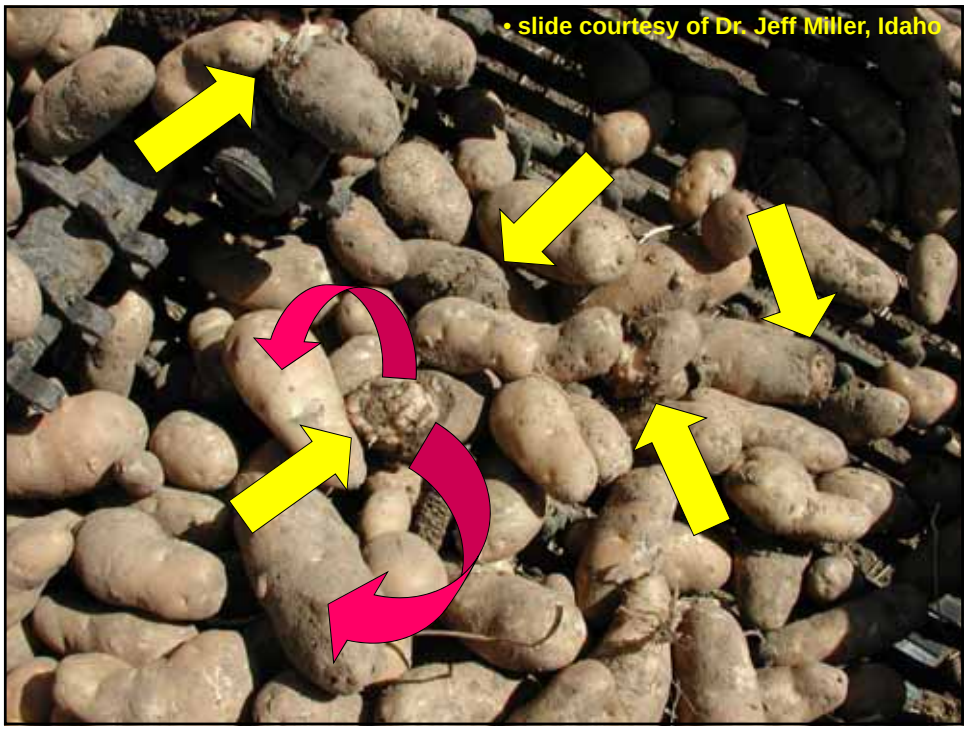
Late Blight (*Phytophthora infestans*) 2009 Canadian Survey

- One sample from Quebec
- Preliminary result = A2, US-8
- Other isolates from NB, PE also A2, US-8

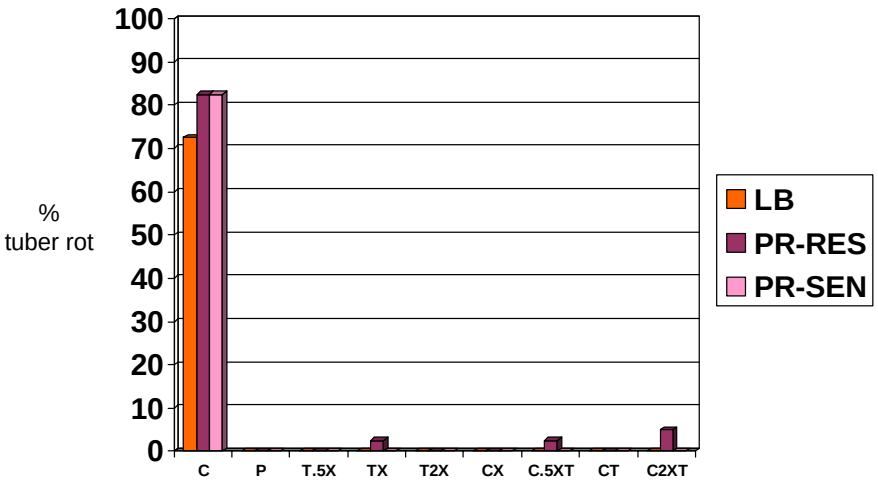
Phosphorous acid-based products

- Mono- and dibasic sodium, potassium and ammonium salts of phosporous acid
- Neutral blend of phosphorous acid salts; converted to phosphite ions in the plant
- Systemic
- Low environmental risk
- Mode of action direct toxicity and/or stimulation of plant defences
  (Gefu Wang-Pruski, Sanghyun Lim – NSAC)

- Confine, Phostrol, Rampart, etc.



Suppression of pink rot and late blight by phosphorous acid (Confine) Post-harvest Application



Field Trials – 2007-2009
Cavendish Farms
***with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC**

Cultivars: Shepody
Russet Burbank

Replications: 4 (RCBD)

Treatments: Check (water)
Confine (5.8L product/250L water/ha)
Bravo (2L product/250L water/ha)
Confine + Bravo

Applications: 10

Phosphorous acid for control of foliar late blight - 2007

* with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC

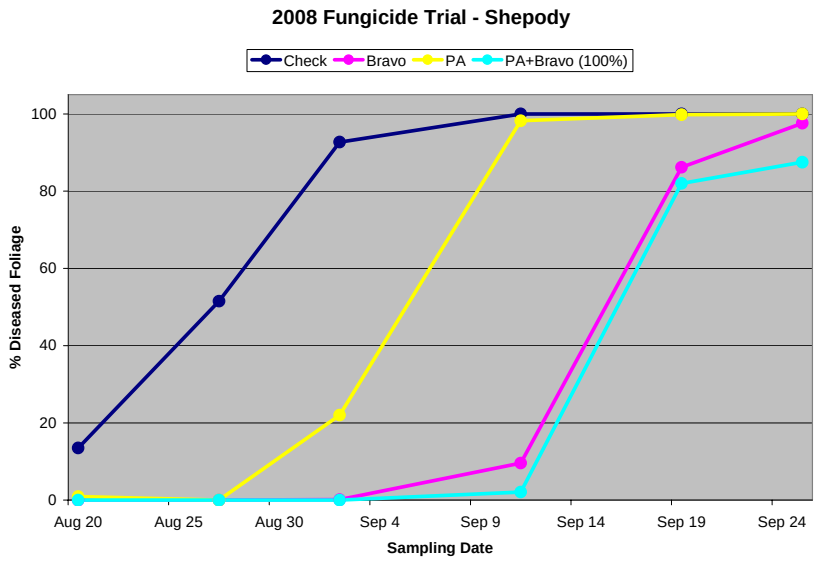
Phosphorous acid for control of foliar late blight – 2008 and 2009

* with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC

- Foliar disease ratings based on natural disease progression in the field

Phosphorous acid and Bravo for control of foliar late blight

* with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC



Phosphorous acid and Bravo for control of foliar late blight

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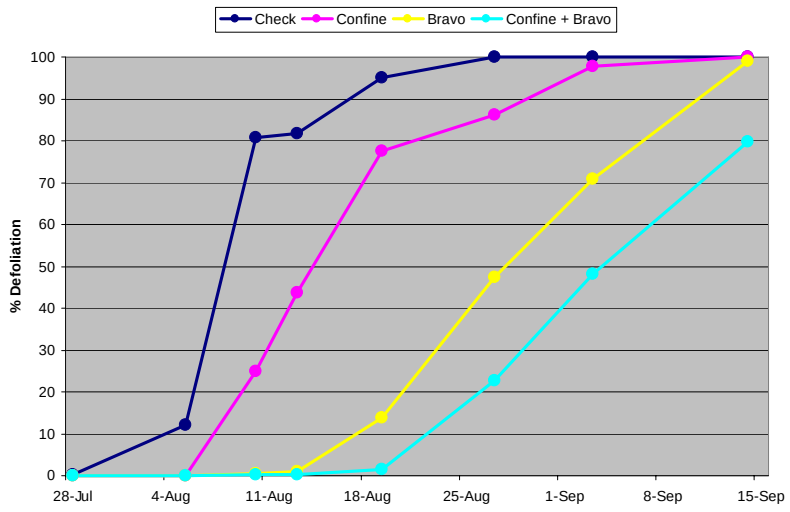

Phosphorous acid and Bravo for control of foliar late blight

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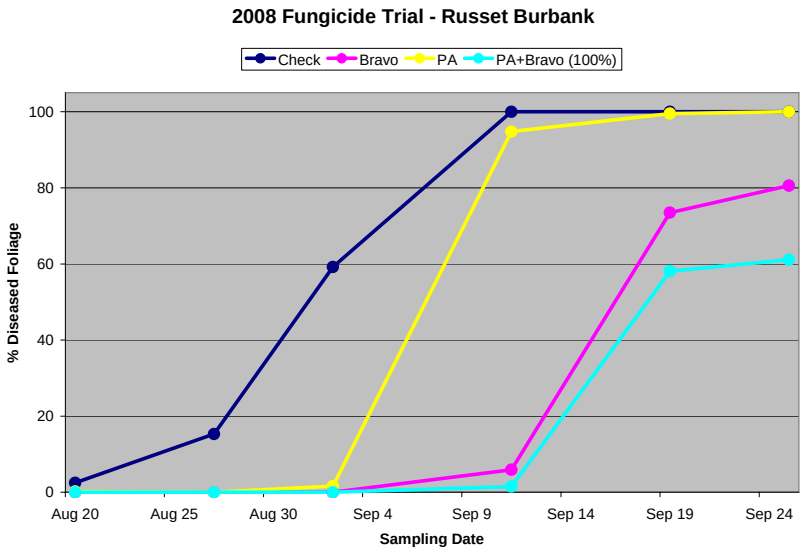

Phosphorous acid and Bravo for control of foliar late blight

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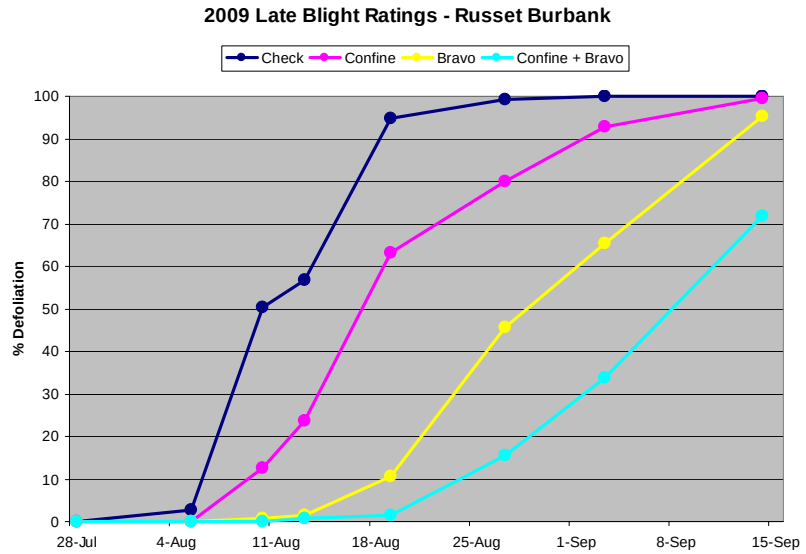


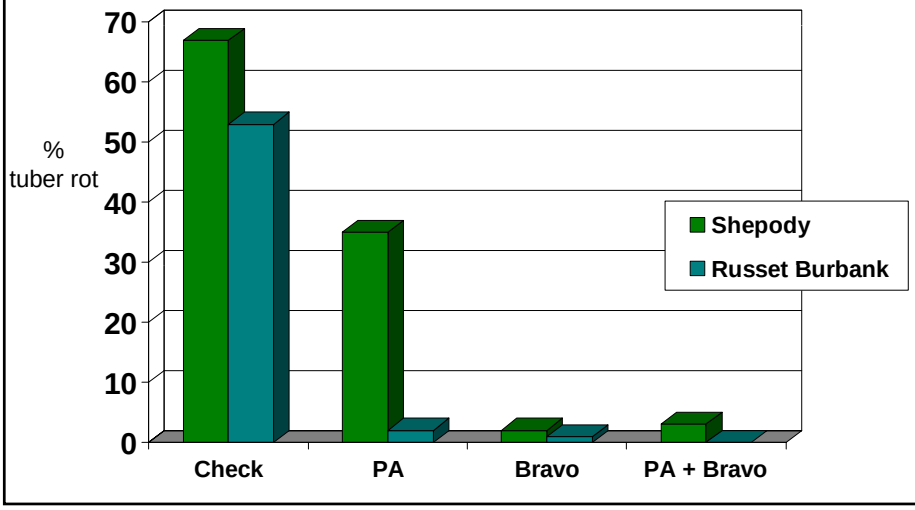
Phosphorous acid and Bravo for control of foliar late blight

* with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC

- Tubers were harvested to assess overall yield and tuber rot

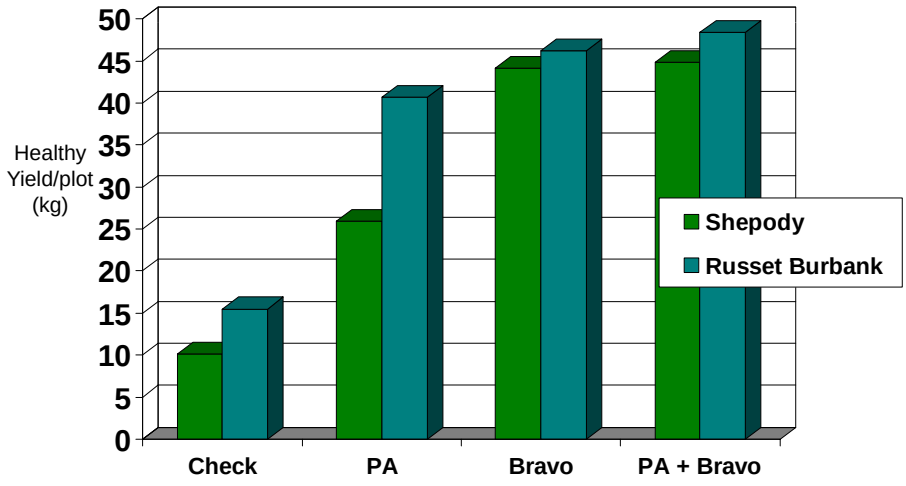
Suppression of late blight tuber rot by phosphorous acid (Confine) and Bravo

Results at Harvest - 2008



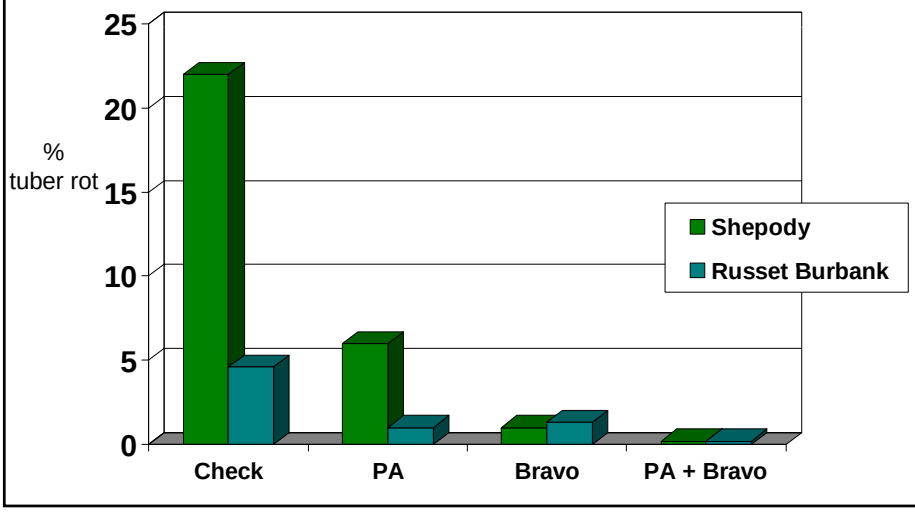
Crop Yield

Results at Harvest - 2008



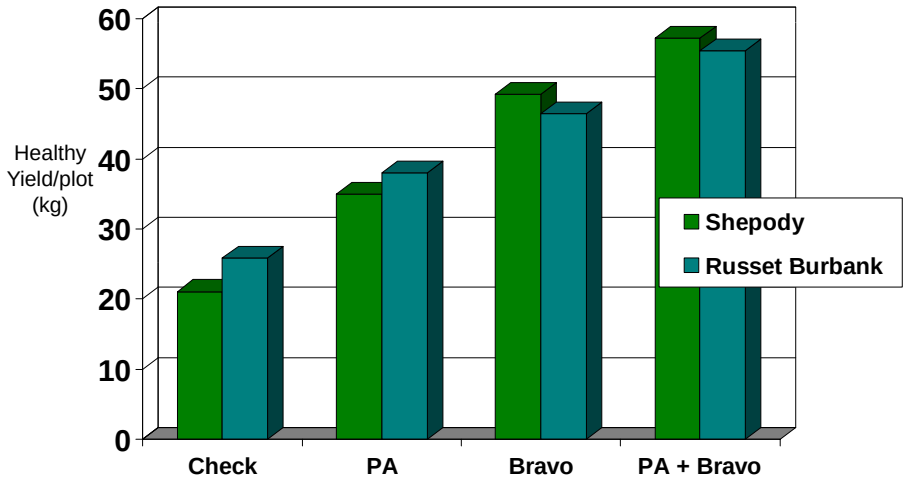
Suppression of late blight tuber rot by phosphorous acid (Confine) and Bravo

Results at Harvest - 2009



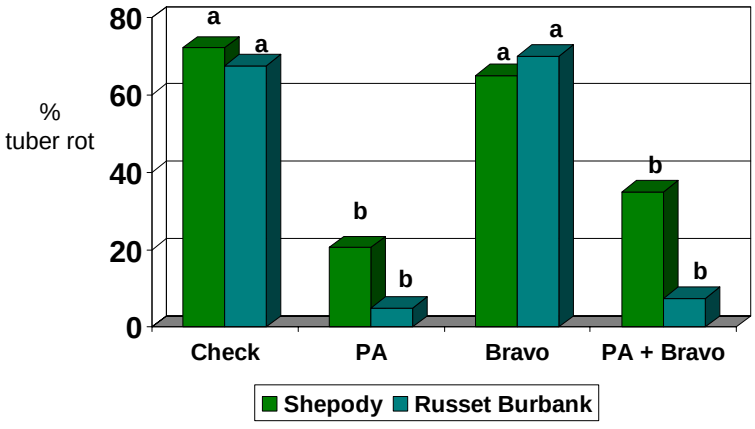
Crop Yield - Total

Results at Harvest - 2009



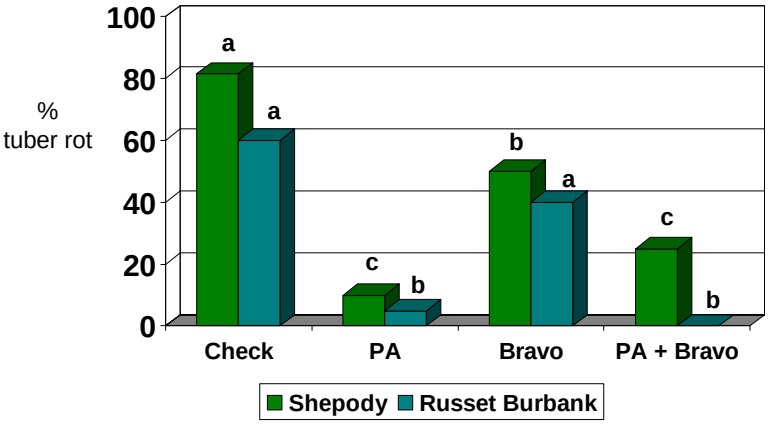
Suppression of late blight tuber rot by phosphorous acid (Confine) + Bravo

Results after inoculation of healthy tubers from field plots



Suppression of pink rot by phosphorous acid (Confine) + Bravo

Results after inoculation of healthy tubers from field plots



Photos: Guardian file, MacPhail Woods, Rob LeClair/CBC, PEI Government

Field Trials – 2008 and 2009
Cavendish Farms

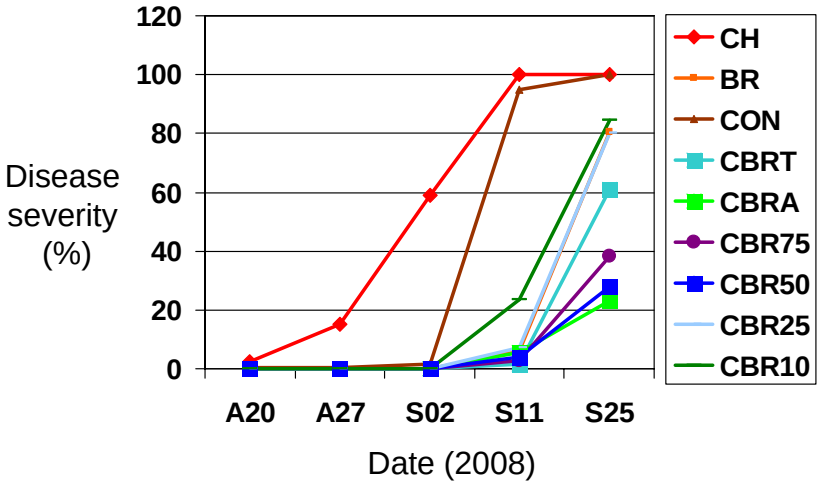
Cultivar: Russet Burbank

Replications: 4 (RCBD)

Treatments: Check (water)
Confine (5.8L product/250L water/ha)
Bravo (2L product/250L water/ha)
Confine + Bravo (tank-mix)
Confine + Bravo (alternating)
Confine + Bravo (1.5L product/ha)
Confine + Bravo (1.0L product/ha)
Confine + Bravo (0.5L product/ha)
Confine + Bravo (0.2L product/ha)

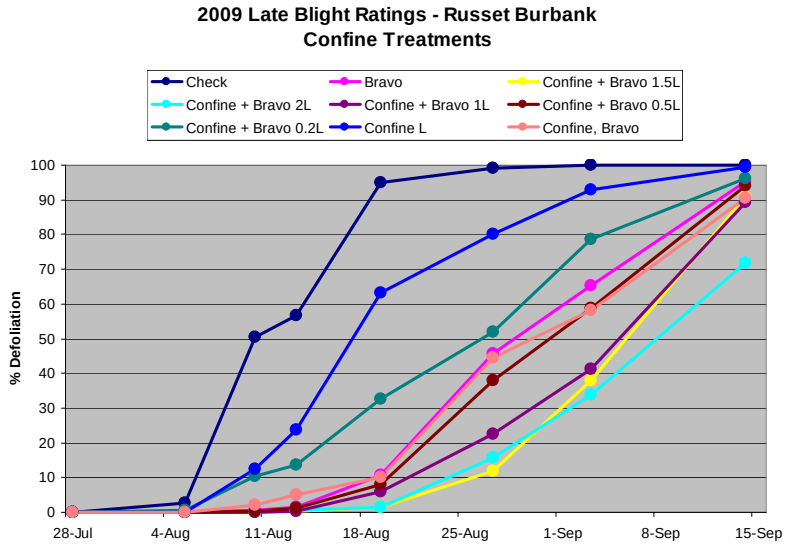
Applications: 10

Impact of foliar treatment on the progression of late blight in a field trial conducted in 2008



Phosphorous acid and Bravo for control of foliar late blight

* with R. Coffin, Cavendish Farms and G. Wang-Pruski, NSAC



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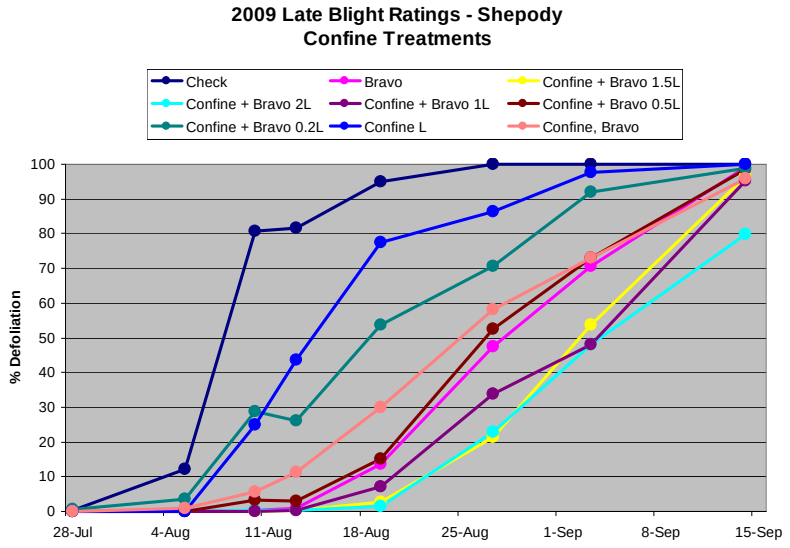
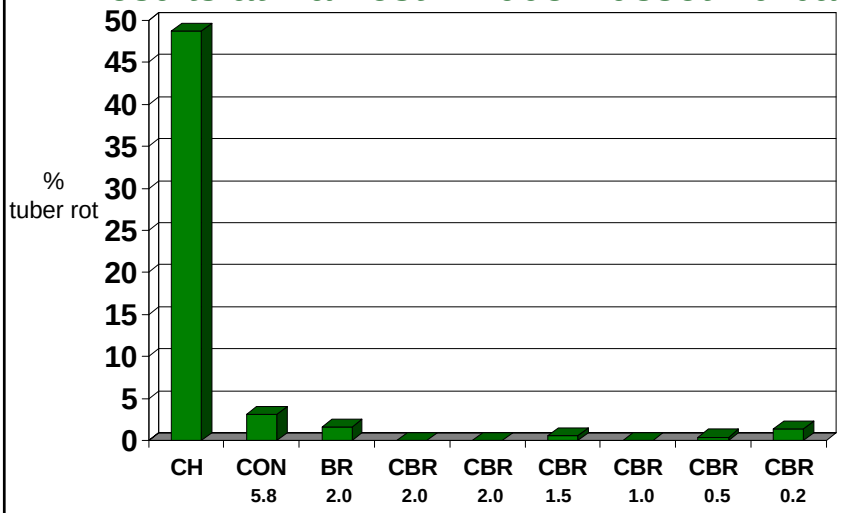
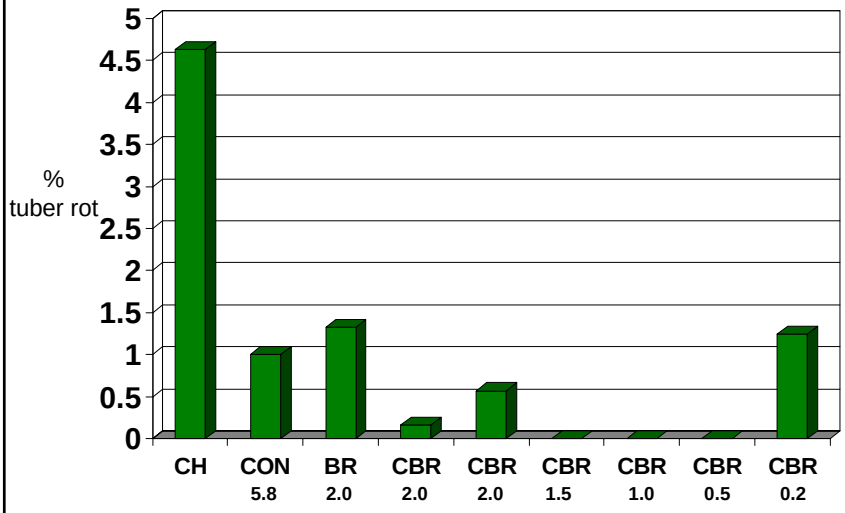


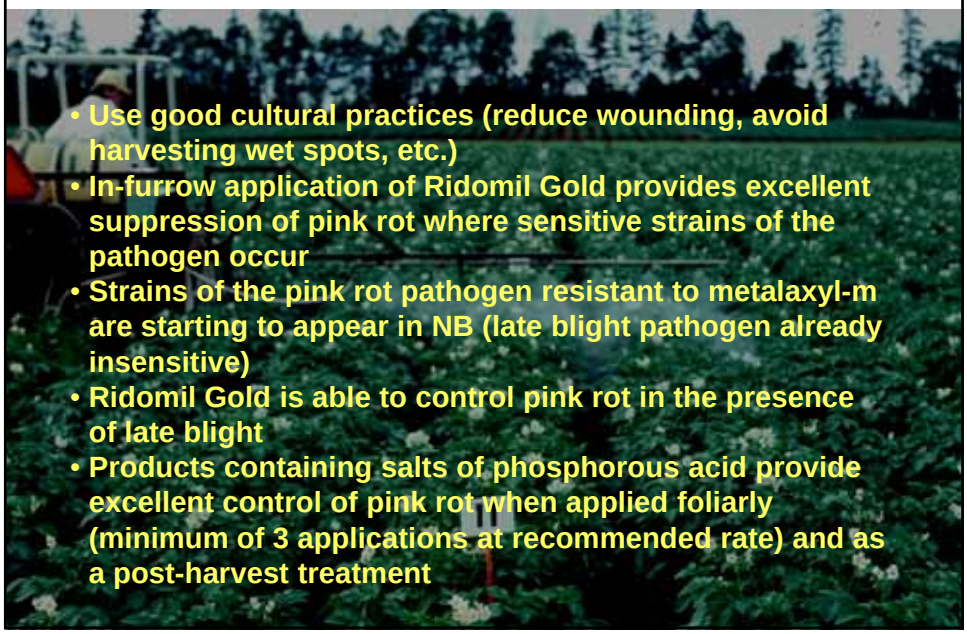
Suppression of late blight tuber rot by phosphorous acid (Confine)/Bravo Results at Harvest – 2008 Russet Burbank



Suppression of late blight tuber rot by phosphorous acid (Confine)/Bravo Results at Harvest – 2009 Russet Burbank



P. erythroseptica - DISEASE MANAGEMENT



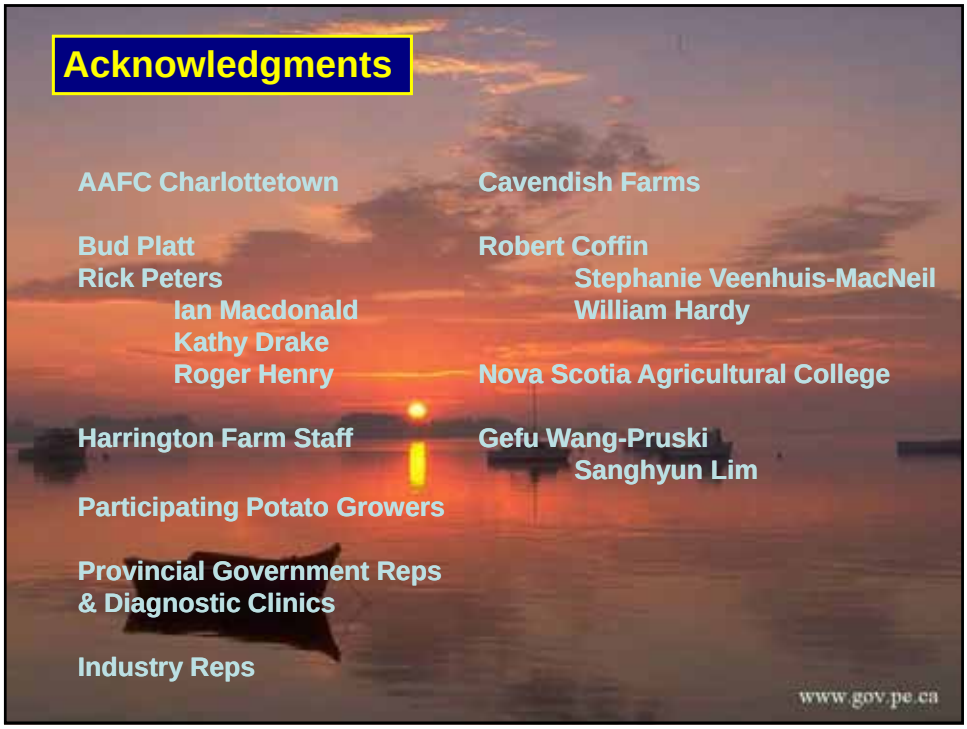
- Use good cultural practices (reduce wounding, avoid harvesting wet spots, etc.)
- In-furrow application of Ridomil Gold provides excellent suppression of pink rot where sensitive strains of the pathogen occur
- Strains of the pink rot pathogen resistant to metalaxyl-m are starting to appear in NB (late blight pathogen already insensitive)
- Ridomil Gold is able to control pink rot in the presence of late blight
- Products containing salts of phosphorous acid provide excellent control of pink rot when applied foliarly (minimum of 3 applications at recommended rate) and as a post-harvest treatment

P. infestans - DISEASE MANAGEMENT

- Remove culls and volunteers
- Use clean seed
- Fungicide seed treatment to prevent spread during cutting and handling
- Application of protectant and locally systemic fungicides during the growing season
- Forecasting systems
- Products containing salts of phosphorous acid provide control of foliar late blight and tuber rot when applied foliarly (minimum of 3 applications at recommended rate) and as a post-harvest treatment
- Best approach (for yield and disease control) is to incorporate PA into a protectant spray program, which also allows reduction in rates of protectant products

Advantages of a phosphorous acid + protectant foliar program:

- Excellent control of foliar late blight
- Combines the benefits of a protectant with a systemic product
- Superb control of late blight tuber rot, even if foliar disease is present (especially late in the season)
- Allows usage of reduced rates of protectants for environmental benefits
- Excellent control of pink rot and provides a resistance management tool for Ridomil
- Suppression of late blight and pink rot in tubers lasts into storage
- Suppression of early blight
- Post-harvest application of PA for late blight, pink rot and silver scurf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Thank you !
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