



HORT MATTERS



OMAFRA SPECIALISTS IN HORTICULTURE AND SPECIALTY CROPS

Bringing the Resources of the World to Rural Ontario

VOLUME 7, ISSUE 22

DATE: AUGUST 23, 2007

Exploring Fire Blight Management, Part I: Models

Neil Carter, Tender Fruit and Grape IPM Specialist

Fire blight, a disease primarily of pear and apple, has been recognized as a serious problem for over 100 years. The disease, caused by the bacterium *Erwinia amylovora*, is a perennial issue for growers in Ontario with some seasons being more conducive to the spread of the disease than others. Some research presented at the 11th International Workshop on Fire Blight in Oregon in August, 2007 may help to explain why the disease continues to elude the best efforts at management, at least in some years.

Models for predicting fire blight infection periods can help determine appropriate timing of antibiotic sprays (streptomycin in our area) or antagonistic bacteria applications (*Pantoea agglomerans* from “Bloomtime” or “BlightBan”). Models such as Maryblyt and Cougar Blight have proven exceptionally useful over the last two decades. Growers should be using these models or at least consulting regional reports that mention infection periods. However, these models do not provide perfect prediction and cannot guarantee disease control. As Lawrence Pusey and Tim Smith (both from Washington) pointed out, there are multiple factors – some still poorly understood – that explain why something as simple as a four day temperature evaluation prior to a wetting period (as used in Cougar Blight) actually manages to usually effectively predict the potential for infection. The four day period was originally incorporated into the model based on an assumption that flower stigmas support the growth of *E. amylovora* for only a few days after flower expansion. It is now known that flowers can be infected for a much longer period depending on environmental conditions, and that there is a continuum of multiple peaks of infection risk as new flowers open especially in areas where orchards bloom at different times because of gradients in climatic factors. Nonetheless, Cougar Blight and other models definitely assist in predicting peak infection periods and these models should always be used as part of an integrated approach to disease management.

No model can predict all blossom infections though. For one thing, models predict peak infection activity not all infections. In addition, there are sources of infection that the models cannot possibly predict or take into account (see Part 2 of this series on fire blight – “Infection Sources”).

The key to remember is that perfect control is unlikely in most years unless chance favours you through ideal environmental conditions for flowering but not for fire blight infection and there are no systemically infected blossoms already present in the orchard. As well, antibiotic sprays must be well-timed by the models (which are imperfect). Applications must be made under ideal conditions and with excellent coverage, follow-up monitoring, and additional application where needed.

Much work on the basic biology of *E. amylovora* continues and will help to refine the predictive disease models (for example, work at Cornell by Dewdney *et al.*, 2007). Predictive models are only part of the fire blight management puzzle; good management practices in all aspects of the disease are necessary for adequate suppression of fire blight.

References:

Dewdney, M.M., R. C. Seem, and H. S. Aldwinkle. 2007. The effect of apple blossom age on populations of *Erwinia amylovora* on the stigma surface. 11th International Workshop on Fire Blight, Paper P12.

Pusey, L.P. and T. Smith. 2007. Susceptibility of apple hypanthium to *Erwinia amylovora* in relation to flower age and 4-day temperature evaluation within Cougarblight model. 11th International Workshop on Fire Blight, Paper O3.

For more information on Cougar Blight or BlightBan and Bloomtime: Carter, N. and M. Celetti. 2006. 11 questions about using “Bloomtime” and “BlightBan” to suppress fire blight. Hort Matters, Vol. 6, Issue 30, Dec. 7, 2006

Celetti, M. and N. Carter. 2006. Using Cougar Blight to predict fire blight risk. Hort Matters, Vol. 6, Issue 6, April 12, 2006

Minor Use Updates

J. Chaput, Minor Use Coordinator

Minor Use Registration granted for Belgian Endive for Mertect SC Fungicide

The Pest Management Regulatory Agency (PMRA) recently announced the approval of an URMULE registration for chicory root intended for Belgian endive production in Canada for **MERTECT SC FUNGICIDE** for control of phoma rot on harvested chicory root as a post-harvest, pre-forcing application. Mertect fungicide was already labeled on potatoes, apples and pears for control of post-harvest diseases.

Phoma rot is an annual problem affecting Belgian endive production in Canada and the minor use registration of Mertect Fungicide is a significant step forward for the industry which until now has had no pest control products available to manage this disease.

The following is provided as a general outline only. Users should consult the complete label before using Mertect SC Fungicide.

Mertect SC Fungicide can be used for control of Phoma rot on harvested chicory root intended for Belgian endive production as a post-harvest spray prior to forcing at a rate 80 mL product per tonne of root. The recommended spray volume on chicory roots is 25 L water per tonne of root.

One application per crop cycle is permitted with a pre-harvest interval of 35 days.

Follow all other directions for use on the Mertect Fungicide label carefully.

Mertect Fungicide should be used in an integrated pest management program and in rotation with other management strategies to adequately manage resistance.

This minor use project was sponsored in **2000** by JMS Endives of Quebec. Gratitude is also expressed to Marie Garon, MAPAQ and personnel of Agriculture and Agri-Food Canada, Pest Management Centre for helpful advice and perseverance. We also wish to thank the personnel of **Syngenta Crop Protection** Canada Inc. for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Jennifer Allen, OMAFRA, Guelph (519) 826-4963 or visit the Syngenta website at www.syngenta.ca

Minor Use Label Expansion Granted For Milstop Foliar Fungicide For Control Of Powdery Mildew On Field Peppers

The Pest Management Regulatory Agency (PMRA) recently announced the approval of a minor use label expansion for **MILSTOP FOLIAR FUNGICIDE** for control of powdery mildew (*Leveillula taurica*) on field peppers in Canada. MILSTOP FOLIAR FUNGICIDE, a unique biopesticide, was already labeled in Canada for management of powdery mildew on greenhouse vegetables and ornamentals and grapes. This is the 3rd minor use registration of MILSTOP on a crop grown in the field in Canada.

This will provide both organic and conventional field pepper growers with a much needed disease management tool to manage one of their increasingly challenging disease problems.

MILSTOP FOLIAR FUNGICIDE can be applied as a foliar spray prior to the appearance of disease at a rate of 2.8 to 5.6 kgs per hectare in a minimum of 1000 L water per ha. Applications should continue if disease conditions remain favourable. Milstop Foliar Fungicide can be applied at 7 day intervals up to 10 times per season. **The preharvest interval is 0 days.**

MILSTOP FOLIAR FUNGICIDE should be used in an integrated pest management program and in rotation with other management strategies. Follow all other precautions and directions for use on the MILSTOP fungicide label.

This minor use label expansion was sponsored by the provincial minor use office of the Ontario Ministry of Agriculture, Food and Rural Affairs in response to minor use priorities established by pepper producers, extension personnel and researchers.

Furthermore, we also wish to thank the personnel of **Bio-works Inc.** for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Jim Chaput, OMAFRA, Guelph (519) 826-3539, Janice LeBoeuf, OMAFRA, Ridgeway (519) 674-1699 or visit www.bioworksinc.com or <http://www.koppertonline.ca>

A Key Minor Use for Field Tomato and Field Pepper transplants once again available – Kocide 2000 Fungicide

E. I. du Pont Canada and the Pest Management Regulatory Agency (PMRA) recently announced the conditional approval of a minor use registration for field tomato and pepper transplants in Canada for **KOCIDE 2000** Fungicide for control of bacterial spot. Kocide 2000 fungicide was already labeled on potatoes, field tomatoes and field peppers however the use pattern for greenhouse transplants of peppers and tomatoes, originally granted in 2001 on the Kocide 101 label was lost when the formulation was changed to Kocide 2000.

Bacterial spot is an annual, serious problem affecting field pepper and tomato production in Canada and the minor use registration of Kocide 2000 fungicide is an important disease management tool which has few management options.

The production and planting of healthy transplants into the field is an important IPM management tool which can lead to a successful harvest. In addition the application of Kocide to transplants in the greenhouse significantly reduces the potential for larger-scale field applications of copper.

The use directions on the new supplemental label are as follows:

- For tomato transplants: **use 3.2 kg per hectare of Kocide 2000 applied every 5 days** when warranted to a maximum of 5 applications over a 4 week period prior to transplanting. Kocide should be combined with 1.75-2.25 kg per hectare maneb or mancozeb. Do not apply to tomatoes within 1 day of harvest.
- For pepper transplants: **use 3.2 kg per hectare of Kocide 2000 applied every 5 days** when warranted to a maximum of 5 applications over a 4 week period prior to transplanting. Maneb and mancozeb are not labeled for use on peppers. Do not apply to peppers within 1 day of harvest

The re-entry interval for both tomatoes and peppers is 24 hours.

Kocide 2000 fungicide should be used in an integrated pest management program and in rotation with other management strategies. Follow all other precautions and directions for use on the Kocide 2000 label.

The re-establishment of this minor use was sponsored by **E. I. du Pont Canada Company** and their patience and commitment to securing this important minor use on the Kocide 2000 label is acknowledged. We also wish to thank the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Janice LeBoeuf, OMAFRA, Ridgeway (519) 674-1699 or visit the Dupont Canada website at www.dupont.ca/ag

3rd Canadian Sweet Potato Minor Use Registration granted to Biosafe Storox Bactericide/Fungicide

The Pest Management Regulatory Agency (PMRA) recently announced the approval of the 3rd URMULE registration for sweet potatoes in Canada for **BIOSAFE STOROX BACTERICIDE/FUNGICIDE** for control of bacterial soft rot on newly harvested sweet potatoes. Biosafe Storox was already labeled on white potatoes for this use.

Bacterial soft rot control has become an annual problem affecting sweet potato production in Ontario and the minor use registration of Biosafe Storox Bactericide is a significant achievement for the industry which until now has had no pest control products available to manage diseases.

The following is provided as a general outline only. Users should consult the complete label before using Biosafe Storox.

Biosafe Storox can be used for control of bacterial soft rot on newly harvested sweet potatoes using two methods of treatment: using a dilution rate of 1:100 and an application rate of 100 mL of Storox per 10 L water apply the diluted solution on tubers to runoff to achieve full and even coverage. The recommended spray volume on newly harvested sweet potatoes is 4.15 to 8.3 L water per tonne.

Additional applications to post-harvested sweet potatoes in storage can be made daily as a direct injection into humidification water. Apply the diluted product for at least 20 minutes per day at an humidification airflow rate of 0.6 cfm using a dilution rate of 1:100 product/water (100 mL Storox/10 L of water).

Follow all other directions for use on the Biosafe Storox label carefully.

Biosafe Storox should be used in an integrated pest management program and in rotation with other management strategies to adequately manage resistance.

This minor use project was sponsored by the minor use office of OMAFRA. We also wish to thank the personnel of **Biosafe Systems LLC** and D. W. Latter and Associates for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Jim Chaput, OMAFRA, Guelph (519) 826-3539, Melanie Filotas, OMAFRA IPM Specialist at Simcoe (519) 426-4434 or visit www.biosafesystems.com . GRB Ag.