



THE TENDER FRUIT GRAPE VINE

A Newsletter for Commercial Fruit Growers

Volume 11, Issue 4

March/April 2007

In this issue

*South-Western Spring Pruning
Demonstration*

*Orchard Sprayer Optimization
Workshops*

Winter Injury

*Peaches: Are you really making
money?*

2006 Peach Cultivar Evaluations

*Ontario Fruit Testing Association
(OFTA) Report*

*Copper for Suppression of Bacterial
Canker in Sweet Cherry?*

*Be Aware of Phytophthora Root,
Crown and Collar Rot this spring*

Grape Bud Survival – March 19

*Attempt at Damage Risk
Assessment for Grapes*

*Why is grape berry moth so difficult
to handle*

*Don't Cut Wild Grapevines to
Reduce Grape Berry Moth
Populations*

*Part 2: Improving Weed
Management in Young Trees*

Coming Events

April 11-13 - **Growing the Margins Energy Conference** - London Convention Centre. Energy Conservation and Generation for Farms and Food Processors. For program details and registration information visit: www.gtmconf.ca

April 25 – **Spring Pruning Demonstration for Simcoe and South-Western Ontario tender fruit growers**. More more information see page 2.

April 14, **Orchard in Your Backyard, Grafting and Pruning Workshop**, 9:30 a.m., Niagara Fruit Institute, Winona. For more info visit: www.niagarafruitinstitute.ca

June 7, 8, 9, **Bacchus at Brock & Uncorked Tradeshow**, Brock University, St. Catharines. For more information go to <http://www.brocku.ca/bacchus>

Weather Information*

Location	Maximum °C		Minimum °C	
	Jan	Feb	Jan	Feb
Vineland	12.4 5 th	6.4 20 th	-17.1 25,26 th	-18.7 15 th
Harrow	10.2 5 th	3.6 20 th	-16.1 29 th	-19.4 5 th
Simcoe	11.4 5 th	5.8 20 th	-18.6 25 th	-19.1 15 th

Location	Precipitation (mm)	
	Jan	Feb
Vineland (85 yr ave)	76.9 62.1	37.3 57.7
Harrow	na	na
Simcoe	60	15

**We would like to thank the University of Guelph at Simcoe, the Ontario Weather Network (OWN,) and AAFC Harrow for the weather data*

Contributors in this issue: Ken Slingerland, Neil Carter, Leslie Huffman; also Michael Celetti, OMAFRA, Torrie Warner, OFTA

The Tender Fruit Grape Vine is brought to you by the following staff of the Ontario Ministry of Agriculture, Food and Rural Affairs:

Ken Slingerland
Tender Fruit & Grape Specialist
Editor
☎ 905-562-1639

Neil Carter
Tender Fruit & Grape IPM
Specialist
☎ 905-562-3833

Leslie Huffman
Weed Management (Horticulture)
☎ 519-738-2251, Ext. 499

Dr. Jennifer DeEll
Fresh Market Quality Program
Lead
☎ 519-426-1408

Hugh Fraser, Engineer
Horticultural Crop Structures & Equipment
☎ 905-562-1618

Rebecca Shortt, Engineer
Irrigation/Water Management
☎ 519-426-4920

ALL QUERIES, COMMENTS, QUESTIONS AND REQUESTS CAN BE DIRECTED TO THE ABOVE.

For a complete list of Crop Technology Staff visit the OMAFRA web site at:
<http://www.omafra.gov.on.ca/english/crops/resource/stafcrop.htm>

The Tender Fruit Grape Vine is compiled at the OMAFRA Vineland Resource Centre. Mailing list revision and additions should be sent to O.M.A.F.R.A., Box 8000, Vineland Station, Ontario L0R 2E0

Spring Pruning Demonstration **For Simcoe and South-Western Ontario** **Tender Fruit Growers**

Sponsored By OMAFRA and CanGro Foods Inc.

Our annual orchard pruning demonstration and discussion on peach and pear orchard cultural practices, led by Ken Slingerland, OMAFRA Tender Fruit & Grape Specialist, is being offered for the benefit of growers in the following areas:

Simcoe:

Wednesday April 25, 2007 – 9:00 a.m.

- Host: Murray Porteous, Simcoe - *Take Hwy #3 to Renton (east of Simcoe). Turn at the lights and go north 4 concessions to the 11th concession. Turn right and the peach block is on the right hand side.*

Wednesday April 25, 2007 – 10:30 a.m.

- Host: Tony and Debbie Haegens, 122 Charlotteville West Qtr, St. Williams (*Just off the 24*)

Blenhiem:

Wednesday April 25, 2007 – 3:00 p.m.

- Host: John McGuigan's Orchards, Charing Cross Road, Cedar Springs (*1/2 mile south of Cedar Springs on the left side of road*)

Come on out and participate in the demonstration and network with fellow growers, Ken and Richard.

For more information, contact:

Richard Matthie, CanGro Foods - 905-262-5011 or 905-658-2603
Ken Slingerland - 905-562-1639

Pre-registration is not necessary and the session will be held rain or shine.

Orchard Sprayer Optimization Workshops

The increased costs of pesticides and the drive to reduce unnecessary pesticide use has encouraged growers to look at methods of improving spray coverage and deposition in the tree canopy, all the while minimizing spray drift. The Ontario Ministry of Agriculture, Food and Rural Affairs will be providing hands-on workshops aimed at providing apple and tender fruit growers with information on:

- evaluating spray coverage and improving deposition in tree canopies,
- incorporating new technologies to improve coverage and maximize product performance
- using windbreaks and other barriers to reduce drift
- funding opportunities for new sprayer technologies

Twilight workshops are planned for Leamington, Simcoe, Niagara, Newcastle, and the Georgian Bay.

More information on the date and location of these workshops will be provided in the next newsletter and on the OMAFRA website at:

<http://www.omafra.gov.on.ca/english/crops/conferences/index.html>

Growers in Niagara interested in hosting the workshop should call Neil Carter at 905-562-3833.

Winter Injury

Ken Slingerland, Tender Fruit & Grape Specialist, OMAFRA

After some concern with the very mild December and early January, normal winter temperatures returned for the remainder of the winter. The coldest temperature recorded at Vineland was -18.7°C on February 15th, however temperatures were slightly colder in other areas away from the lake. Recently, buds were cut and it would appear that we are generally heading into spring with a

healthy crop of buds. There are locations and certain crops like apricots and Japanese plums that might have less than expected bloom.

In 2006, fruit bloom occurred in the last week of April for most tender fruits, some of the earliest dates on record. If the season is advanced again this spring, growers should be prepared to do whatever is necessary to prevent spring frost damage. It is too early to tell at the time of writing this article, but if we experience too many days with extreme warm temperatures, we again run the risk of spring frost injury and poor fruit set.

March 26 Sampling Results - % Alive

Fonthill

Redhaven, Venture	90% plus
Cultivars in frost pockets	less than 25%

Vineland Station

Vivid	90%
Garnet Beauty	89%
Early Redhaven	95%
Redhaven	94%

NOTL Parkway

Fantasia nectarine	86%
--------------------	-----

St. Davids

Virgil	100%
Vulcan	96%

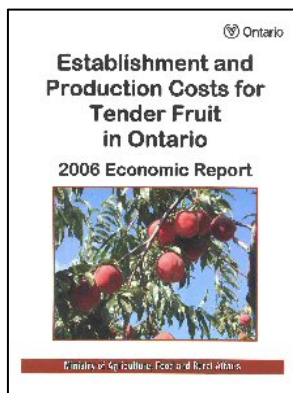
Peaches: Are you really making money?

Ken Slingerland, Tender Fruit & Grape Specialist, OMAFRA and John Molenhuis, Business Analysis and Cost of Production Program Lead, OMAFRA

Yes – but how much. The 2006 Cost of Production for Tender Fruit has just recently been revised. The economic report looks at the profitability of the tender fruit industry and answers many questions about the cost of establishing an orchard and the profitability of a mature orchard. This report has been used in the past as a guide for growers to determine what crops to plant based on profitability, a guide for agri-business, by insurance companies

to determine compensation for loss of trees due to accidents and also a guide for CFIA.

A hard copy of the report is **free** and will be available soon at the OMAFRA Resource Centres at Vineland, Simcoe, Brighton and Harrow, at the Ontario Tender Fruit Producers' Marketing Board in St. Catharines, and on the OMAFRA website at <http://ontario.ca/omafra>



2006 Peach Cultivar Evaluations

Ken Slingerland, Tender Fruit & Grape Specialist, OMAFRA

The CanAdapt Funded Peach and Nectarine cultivar Evaluation project, sponsored by the Ontario Fruit Testing Association (OFTA) and the Ontario Tender Fruit Producers' Marketing Board and the Niagara Peninsula Fruit and Vegetable Growers' Association was completed in 2005. However, evaluations of some cultivars were carried out in 2006 due to the high interest in new cultivars. All peaches were evaluated at the Victoria Avenue Farm, University of Guelph, Department of Plant Agriculture, Vineland. 2006 was a good growing year and many cultivars rated commercially acceptable to very good.

Risingstar – a yellow flesh peach ripening 14 days before Redhaven. The firmness and quality are fair but otherwise an acceptable peach. It might require an extra pick depending upon crop load.

Redstar – a yellow flesh peach ripening with Redhaven. About the same colour and blush as Redhaven but firmer. Needs to be left on the tree longer to attain high colour. Worthy of testing as an alternative to Redhaven but not as good as Vivid overall.

Starfire – a yellow flesh peach ripening about 4 days to a week after Redhaven. Appearance, size and overall ratings were very good. Worth planting.

PF 17 – a yellow flesh peach that fits a good season ripening 7-9 days after Redhaven. It is a highly coloured, good quality fruit with a good uniformity of crop. Fruit was “air” free from the pit. Fruit size is good with a high overall rating.

HW267- a yellow flesh peach ripening 7-9 days after Redhaven. It had a good crop, colour with very large fruit size, firmness and overall ratings. Worth planting.

Blazingstar – a yellow flesh peach that fits a good season ripening 6-8 days after Redhaven. It is a highly coloured, good quality fruit with a good uniformity of crop. Fruit size is good with a high overall rating.

Coralstar – a yellow flesh peach ripening 7-9 days after Redhaven. It had a good crop and overall rating but needs to be left on the tree to get good background colour. Good resistance to peach canker. Worth planting.

PF 23 – a yellow flesh peach ripening 14 days after Redhaven. It has very good fruit size, firmness and colour but a hint of fruit and leaf spot in wet years. Worthy of testing even though it was slightly misshapen on the suture in 2006.

Allstar – a yellow fleshed peach that ripens 14 days after Redhaven. It had very good ratings in all categories and fits in a good season. Worthy of testing.

Bounty – a yellow fleshed peach that ripens 14 days after Redhaven. It had only a fair crop in 2006 even though it had a very high amount of bloom. Fruit is susceptible to powdery mildew in wet growing seasons. Fruit colour and size is excellent but is better suited to warmer climates due to winter injury in some years.

Glowingstar – a yellow fleshed peach ripening 16 days after Redhaven. This cultivar had good ratings in 2006 except for an odd “blocky” shape. Worthy of testing.

Cultivar	TG	WI	PC	BD	Amt	Cr	RD	RD	Un	Sf	Co	Bl	At	Fi	Fr	Qu	RiF	SP	LS	FS	Ra	
							05	06														
Risingstar	8.5	9	9	7	9	8	-13	-19	6.5	7	7	7	7	6.5	5.5	7	7.5	8	9	9	7	
Redstar	8	9	8.5	7	9	7	-2	-2	7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8.5	8.5	9	9	7.5	
Redhaven	7	9	7	5	8	7.5	0	0	7	7.5	7.5	7	7.5	7	7	7.5	8	9	9	9	7.5	
Starfire	8	9	8	5	9	7			4	7	7.5	7.5	7.5	8	7	8	7	7.5	9	8.5	9	7.5
Flat Peach	7.5	9	8	6	9	5			7	6.5	7	6	5	6	6	6	6.5	9	8	7.5	8	6.5
PF17	8	9	8	6	8.5	7			7	7	7.5	7.5	7.5	7.5	9	7.5	9	9	8.5	9	7.5	
HW267	7	7.5							9		8	8	7	8	8	8.5	7.5	8.5	8.5	8	9	7.5
Blazing-star	8.5	9	7.5	7	9	8			9	7	7	8	8	8	7.5	8	7.5	8	9	8.5	8.5	7.5
Coralstar	8	9	9	5	9	7.5	11	11	7.5	7.5	7	7	7	7	8	7	8.5	9	8.5	9	7	
Allstar	8.5	9	8.5	5	9	7.5	1	13	7.5	7.5	7.5	7.5	7.5	7	8.5	7.5	8.5	9	9	9	7.5	
PF 23	8	9	7.5	5	9	7.5			13	7	7	7.5	7.5	7.5	9	7.5	8.5	9	8.5	9	7	
Bounty	8	9	8	5	9	5.5			14	7	8	7.5	7.5	7.5	7	8.5	7.5	8.5	9	9	9	6.5
Glowing-star	8	9	7.5	6	8.5	7			16	7	7	7.5	7.5	7.5	7	9	7	8.5	9	9	9	7

Key to the Cultivar Ratings

A standard scoring for most categories, unless otherwise listed, is defined as the following; 9 = exceptional, 7 = good, 5 = commercial acceptable, less than 5 is unacceptable. A 5 rating or less is occasionally acceptable in one category when other category ratings are much higher e.g. Freeness for early season peaches is sometimes too clingy to the pit but that is normal for early season peaches.

The rootstock for all cultivars is Bailey, except for Sugar Giant and Sugar May which are on Lovell.

Cultivar – The name of the cultivar is listed followed by any restrictions if applicable.

Tg – The tree growth or vigour from the previous year, assessed at bloom time.

Wi – The amount of winter injury based on the amount of dead bloom and the length of dead tips on shoots.

Pc – The amount of peach canker; 9 = no canker, 7 = small branches, 5 = major scaffold, 3 = loss of scaffolds.

Bd – The date of which 80% of the flowers are in full bloom during the month of May.

Ba – The amount of flowers blossoms on the tree.

Cr – The amount of crop at harvest for Niagara, actual harvest weights are used for the Cedar Springs plantings

Rd – Ripe date when the first commercial harvest occurs. Days before (-) or after (+) Redhaven.

Un – Uniformity of fruit on the tree, i.e. 1 harvest = 9, 2 harvests = 8, 3 harvests = 7, 4 harvests = 6, etc.

Sf – Size of Fruit, e.g. 3" = 9, 2 ¾" = 8, 2 ½" = 7, 2 ¼" = 6, 2 ⅛" = 5, less than 2 ⅛" = 4

Co – Colour of fruit exterior, background colour, etc.

Bl – The percentage of the blush on most of the fruit; 90% = 9, 70% = 7, 50% = 5, etc.

At – Attractiveness of fruit, brightness, concentration of colour, contrast, free from blemishes, etc.

Fi – Firmness of fruit at harvest

Fr – Freeness of the flesh from the pit

Qu – Quality of fruit, flavour, texture, sugar/acid ratio

Rf – Red in flesh; no red = 9, slight discolouration and some red at pit = 7, flesh heavily streaked from centre = 5, etc

Sp – Split pits; none = 9, 5% = 7, 10% = 5, 25% = 3.

Ls – Leaf spot; very resistant = 9, moderately resistant = 7, somewhat susceptible = 5, very susceptible = 3

Fs – Fruit spot; same as above

Or – Overall rating; considers above ratings and also includes susceptibility to diseases, skin pubescence, etc.

Ontario Fruit Testing Association (OFTA) Report

Torrie Warner, President

As most you are aware, 2006 completed the tree distribution for OFTA as we know it. OFTA is now in remission but can be resurrected at any time our services are needed. At our directors meeting in January it was decided to leave the current board intact. Audie Leenaars, our general manager now owns and operates the Depot Deli in Grimsby. Joanne Neufeld, our secretary, retired in May of 2006. Any secretarial/management services required are still being conducted by Grape and Tender Fruit Ontario out of the marketing board office in St. Catharines.

Plum pox was the final blow to OFTA, and until its eradication OFTA cannot effectively distribute trees for testing as in the past. However, for the 2007 season, Ken Slingerland, OMAFRA Vineland, has agreed to evaluate some of the Vineland and Harrow selections that have been planted in previous years. Results will be shared with growers through newsletters and presentations.

In the future, the Vineland Renaissance Report and potential adoption could include OFTA, or a similar fruit testing program. OFTA is taking a wait and see approach until any announcement is made about the re-vitalization of the Vineland Research Station.

I'd like to thank Audie and Joanne, the staff at U of G, Vineland, Simcoe, and Cedar Springs, Adrian, the entire board of directors, and all of our members. It has been a pleasure working with you the last few years. I look forward to whatever the future holds.

Copper for Suppression of Bacterial Canker in Sweet Cherry?

*Neil Carter, Tender Fruit and Grape IPM
Specialist, OMAFRA*

Bacterial canker of sweet cherry is caused by a couple of related organisms, *Pseudomonas syringae* pv. *syringae* and *Pseudomonas syringae* pv. *morsprunorum*. Various pathovars ("pv") of *P. syringae* cause numerous plant diseases including some that fruit growers are familiar with such as blossom blast of pear.

Bacterial canker infections occur through any kind of wound in a tree including through leaf scars as leaves fall in the autumn. *P. syringae* does well during cool, wet weather, so spring and fall are the main infection periods.

Since *P. syringae* is a bacteria, fungicides have no effect on it, but copper applications have been used in an attempt to manage it in some jurisdictions for many years. At least two copper formulations are registered in Canada for management of bacterial canker of sweet cherry. However, this approach does not eliminate the disease and at best, can only help suppress *P. syringae* that have not already infected plant tissues. Copper is not systemic, so those bacteria already within their hosts (such as in existing cankers) are protected from these applications.

Registered copper products suggest two applications per year; one in the fall when 75% of leaves have dropped and one in the spring before bud break. Spring applications are risky if buds are too far along since copper is quite phytotoxic to sweet cherry. Fall applications probably reduce surface populations of *P. syringae*, but at 75% leaf drop, there has been plenty of opportunity for the bacteria to invade and be protected in small leaf scars. Once again, in both spring and fall, bacteria that have already infected a host tree are unharmed by copper sprays.

There is also a relationship between cold injury and bacterial canker. *P. syringae* is an opportunistic

pathogen so any tissue damaged by frost or cold temperatures can more readily be infected. In addition, the bacteria act as ice nucleation sites, so already infected tissue is more at risk from cold injury. It's a vicious cycle, compounded by the fact that it is difficult to tell the difference between cold injury and bacterial canker even if they did occur separately.

P. syringae also colonize sour cherry although symptoms of the disease are not as severe in sour cherry. Sweet cherry orchards adjacent to sour cherry may be more at risk from bacterial canker. Limiting the bacteria in the adjacent crops should in theory help reduce the local bacterial population but that may not be practical or always advisable.

So, should copper sprays be applied against bacterial canker or not? Dr. George Sundin from Michigan State University has worked with *P. syringae* for some time. His field studies indicated that the blossom infecting phase of *P. syringae* was relatively independent of the amount of bud colonization in the fall. In other words, fall copper applications had no effect on the populations of *P. syringae* infecting blossoms the following spring. Although there are some growers who believe that a fall copper application is useful against bacterial canker, there is no data to support that strategy at present.

In general, it probably is advisable to use copper on newly planted orchards where bacterial cankers are not already present, but for older, already infected orchards it may be pointless unless the goal is to reduce local surface populations of *P. syringae* to try to protect nearby young trees.

Since *P. syringae* is opportunistic, avoid injury during susceptible periods when possible. Prune when trees are fully dormant or, if pruning must be done in the spring, wait for a few days of forecasted warm, dry weather so pruning cuts can heal more rapidly. That won't prevent all infections from occurring (nothing really seems to!), but it might help. Stressed trees are more likely to become infected, so all other good horticultural practices that keep trees healthy and productive should be followed.

Be Aware of Phytophthora Root, Crown and Collar Rot This Spring

Michael Celetti, Plant Pathologist, Horticulture Crops Program Lead, OMAFRA

Root, crown and collar rots of fruit trees caused by soil borne *Phytophthora* spp. may become more prevalent in fruit trees this coming spring and perhaps over the next few years due to the long cool wet fall in 2007. *Phytophthora* spp. are fungal-like organisms that cause most damage on trees growing in heavier wet soils or soils that retain water for a long period of time. Unfortunately, many orchard soils have been saturated and some have spots with standing water in low areas during the past few months. These prolonged wet soil conditions are ideal for pathogens such as *Phytophthora* to continuously infect roots and crowns allowing the disease they cause to progress for an extended period of time. Most actively growing trees can tolerate a certain amount of root and crown rot and often limit the advancement of the disease. However, dormant young trees or trees that are growing slowly are most vulnerable when the pathogen is still active, which appears to be the situation this past fall and early winter.

Infected trees may decline slowly over several years or they may die within weeks of the first symptoms. Growers should monitor the growth of trees over the next few seasons since reduced shoot growth and small fruit size are symptoms of *Phytophthora* crown and root rot. As the disease advances, infected trees often produce yellow, chlorotic leaves that look similar to iron deficiency symptoms. In fact, foliar symptoms as a result of crown and root rot are often confused with other disorders such as nutrient deficiency. On severely infected trees, buds will swell and break dormancy in the spring; however, these severely infected trees may wilt and die soon after bud break. Orange to dark reddish brown canker or streaks along the cambium just under the bark at ground level of dead or declining trees is a good indication of *Phytophthora* crown and collar rot.

There is no cure once the disease has become established. When planting a new orchard, select fields that have good drainage and light soils if possible. If the soil is heavy or retains water for prolonged periods of time, consider installing sub-surface drainage pipes to reduce. Since the pathogen infects when soils are saturated for long periods of time, managing irrigation to avoid over-watering whether it is through drip or overhead irrigation, will reduce the potential of infection particularly in orchards planted in heavy soils or soils that retain water for long periods of time.

Winter Injury Studies 2006/07

Grape Bud Survival - March 19, 2007

Research Team

Ken Slingerland and Hugh Fraser, OMAFRA

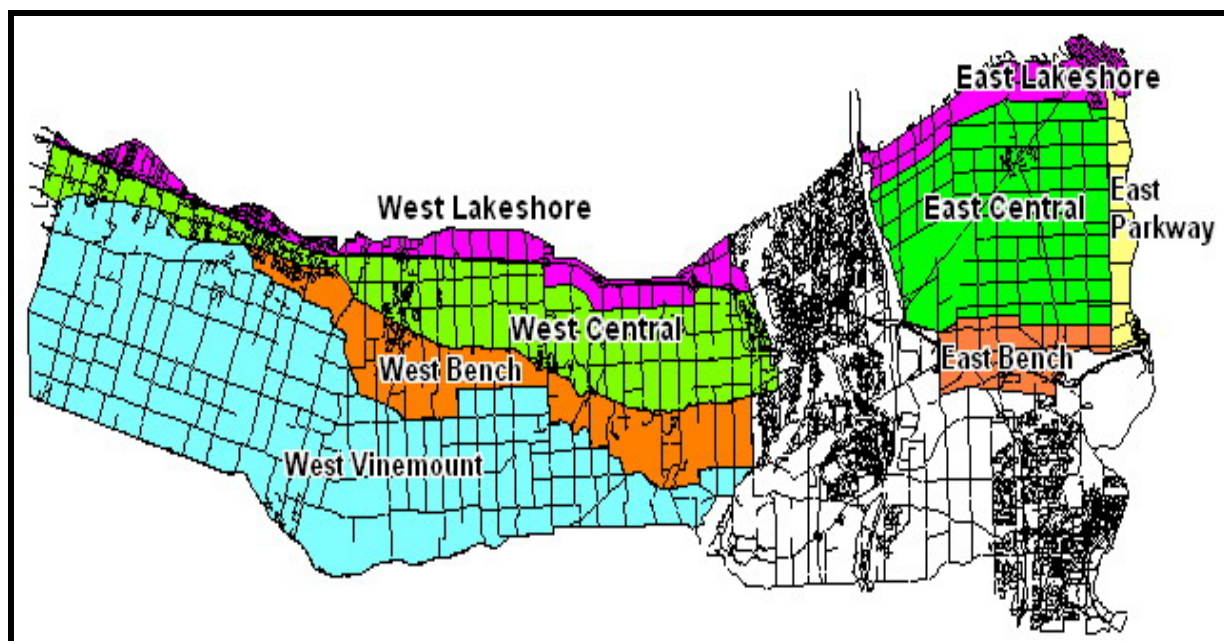
Kevin Ker, CCOVI Brock University & KCMS

Dr. Helen Fisher, University of Guelph

Ryan Brewster, KCMS Applied Research and Consulting Inc.



Grape bud sampling to establish winter survival is part of the 3 year - CanAdvance and CRESTech funded Winter Injury and Wind Machine project. The tables in this article report the sampling results based on the bud collection during the week of March 19, 2007. However, the percent alive may vary up or down from the last sample due to the variation in the samples taken. The tables below are based on multiple samples and multiple sites within in area for each cultivar.



% Live Buds - Labrusca – March 19-22, 2007 (NS means no sample taken)

Cultivar	Location	East of Canal	West of Canal
Concord	Vinemount	NS	96
Niagara	Vinemount	NS	94

% Live Buds - Hybrids – March 19-22, 2007 (NS means no sample taken)

Cultivar	Location	East of Canal	West of Canal
Baco Noir	Central	80	90
	Parkway	80	NS
Foch	Central	NS	75-78
	Vinemount	NS	90
Vidal	Central	68-79	74-78
	Parkway	84-90	NS
	Vinemount	NS	66-76

% Live Buds - Vinifera – March 19-22, 2007 (NS means no sample taken)

Cultivar	Location	East of Canal	West of Canal
Cabernet Franc	Bench	83-99	77-95
	Central	80-97	79-97
	Lakeshore	75-85	81
	Parkway	72-86	NS
	Vinemount	NS	63
Cabernet Sauvignon	Central	NS	95
	Lakeshore	NS	75
	Parkway	83	NS
Chardonnay	Bench	86-97	76-89
	Central	85-86	78-88
	Lakeshore	74-81	NS
	Parkway	67-75	NS
	Vinemount	NS	96
Gamay	Parkway	92	NS
Merlot	Bench	80-99	64-92
	Central	65	88-100
	Lakeshore	82	84-85
	Parkway	74-77	NS
	Vinemount	NS	89
Pinot Noir	Bench	79-97	77-95
	Central	69	68-96
	Lakeshore	91	73-82
	Parkway	81	NS
	Vinemount	NS	66-72
Riesling	Bench	74-97	65-76
	Central	84-85	72-97
	Lakeshore	76	84
	Parkway	77-84	NS
	Vinemount	NS	77-90
Sauvignon Blanc	Central	71	65
	Lakeshore	72	NS
Syrah	Lakeshore	NS	56
	Parkway	76	NS

Attempt at Damage Risk Assessment for Grapes

K.H Fisher, Research Scientist, University of Guelph/HRIO, Vineland

In conjunction with the wind machine project (Fraser, Slingerland, Fisher and Ker), freezing trials were initiated this winter to track the acclimation and de-acclimation of a standard set of grape varieties. We wanted to develop a protocol so that damage risk information could be provided regularly to growers. This “damage risk” would be the predicted freeze temperature at which the buds of a certain variety would be damaged lethal temperature (LT₅₀) based on a sample taken at a specific time interval and at a specific place. It would indicate the point at which 50% of a population of buds subjected to artificial freezing would be killed. This is not one fixed temperature, but changes over time, getting colder as the fall and winter progress and getting warmer as the vines come out of the winter and into spring.

To have this information available to growers is one of the major objectives of this project. The machinery available to develop this data was built last winter and tested this winter. Because we are measuring such small changes in voltage to detect these freezing points, our machinery has to be very clean electrically and we haven’t quite got there yet with the research unit. However, a larger, semi-commercial unit that will handle many more buds at a time is now ready to go. This second unit is giving very good reproducible data and will be fully operational next winter.

In the meantime, two students from Brock University were looking at the viability of buds over this past winter. Even with less than perfect data from the freezing unit, they were able to follow mortality rates from three locations. At one location, there was an irrigation trial where the control vines had a slightly lower number of live buds than those that had replacement irrigation during the growing season. Because we don’t have the bud freezing data to back this up, we will be repeating this part of the trial next winter. In addition, the second student was following bud

mortality at a lakeshore and an inland site. They found a steady level of mortality with little change over the winter at the lakeshore site and a gradual decline in the number of live buds over the winter in the inland site. Again, because of the lack of bud freezing data to back this up, we will be repeating this work again next winter.

With the development of both a commercial and a research freezing unit this past winter, we hope to be able to deliver a more precise value for the acclimation and de-acclimation level of grape buds next winter. We are learning more about the effects of various cultural practices on vine acclimation and continue to improve the knowledge base to help you manage the winter challenges.

Why is grape berry moth so difficult to manage?

Neil Carter, Tender Fruit and Grape IPM Specialist, OMAFRA

Grape berry moth (GBM), *Paralobesia viteana*, has been a difficult pest to manage for a very long time, especially in areas with consistently high populations of this insect. In the past, there have been some broad spectrum pesticides that gave adequate control, but they came with their own set of problems including a high level of non-specificity (i.e. they killed beneficial insects and mites along with the pests). Although there are rumours of an extension of the registration for the broad spectrum pesticide azinphos-methyl (Guthion), the logistics of working around a 28 day re-entry interval (REI) for grapes are problematic to say the least.

Although there are several products that are “in the works” for GBM, there’s not much point discussing them in detail until they are registered. Newer products, as they become available, come from a wide range of chemical families. Many, if not most, of the new products are not rapid contact poisons; rather, they must be ingested to work or they may not produce rapid knockdown of the pest. If you saw the video presented by Dr. Rufus Isaacs at the grape sessions of the OFVC in February, you were

presented with a vivid demonstration of why coverage is so critical with non-contact insecticides. As the video showed, the larval GBM do not even eat the grape skin where they enter the fruit; instead they chew off bits of the grape skin and toss them away. So, for those products that must be ingested, the mouthparts of each larva must come in contact with some of the product at exactly the right time at the tiny site where they chew their entrance into a berry.

Some products that are still available for GBM management are seen by some to be ineffective. Folk wisdom from some quarters has it that registered pyrethroids, carbamates, and organophosphates are all ineffective! Does this mean that resistance to pesticides by GBM is rampant? There's no proof of that in our area and the most recent survey for GBM resistance in Niagara (Pree *et al.* 1998) found no resistance to Guthion. Of course, absence of proof is not proof of absence, but there are other possibilities for poor control that should be considered before claiming resistance is the problem. The other side of that coin is that a population can become resistant if good resistance management practices are not followed. That will always be the case, so rotation of control products by pesticide family or mode of action will always be critical.

Why else might some believe that so many products are ineffective against GBM? Some basic application issues may at times be the reason (see below) but there are also product-specific considerations that should not be ignored. For instance, the insecticidal activity of Imidan (phosmet) is reduced if spray water is above pH 7.0; use a buffer if necessary to get pH in the range of 5.5 to 6.5. Also, the activity of Diazinon is reduced when temperatures are below 20°C while pyrethroids are less effective in hot temperatures; labels of pyrethroids indicate reduced efficacy if daytime highs are above 25°C and suggest that you spray in early morning or in the evening when temperatures are cooler. However, if regular daytime highs are well above 25°C, pyrethroids will be efficacious for only a few days at best regardless of the temperature at application.

Such seemingly simple and basic considerations as ensuring good coverage through canopy management and adequate water volumes cannot be abandoned even if you are upgrading to a new sprayer system or have a desire to cover more acres of vineyard. Speaking of which, Dr. Andrew Landers provided much food for thought on sprayer adjustment and accurate delivery of pesticides in his presentation at the OFVC grape session. Dr. Landers had a lot of take home messages in his presentation but one which must always be repeated is to make sure you are getting your products to the target without wasting your time and money.

An important factor in dealing with GBM is that its basic biology is in conflict with your best attempts at managing it. Adult emergence in the spring is often extended for up to six weeks, ensuring that overlapping generations will occur almost every season. Coordinating spray timing with peak egg hatch or peak egg laying is thus very difficult.

Of course, if your pest management technique doesn't target eggs or hatching larvae, but instead affects the behaviour of adult moths, you would have to be doing it all season. That's where mating disruption (MD) excels – once the dispensers ("twist-ties") are put in the vineyard, MD continues for the entire season. MD for GBM has risen rapidly in acreage in the last two years and it alleviates many of the management issues of conventional pesticides.

Is MD perfect and the solution to everyone's GBM problems? Of course not, there are limitations to all technologies, but MD generally works well for GBM, requiring a minimum vineyard size of 5 acres (2.5 ha) to be effective in most cases. Pest pressure must be low to moderate for MD to work, so knowledge of the history of GBM problems on a site-specific basis is needed before starting an MD program. Transition years using both MD and insecticides can often help bring a high pressure site down to a level where MD can work alone. MD works best if the pheromone dispensers are hung in the vineyard before first flight of the moths in the spring. MD is not a "clean-up" approach and cannot help after moths have mated and are laying eggs in the vineyard. Always plan an MD program in

consultation with your monitoring service in advance of the beginning of the growing season.

Don't Cut Wild Grapevines to Reduce Grape Berry Moth Populations

Hannah Fraser, Entomology Program Lead (Hort), OMAFRA

The native grape berry moth is a primary pest of eastern North American vineyards. Larvae of this insect feed on the developing grape clusters, reducing yields, introducing pathogens and infesting grapes at harvest. Growers have relied on insecticides and more recently, on mating disruption of adults, to manage the damage caused by the three generations that occur in Ontario.

Grape berry moth occurs on both wild and cultivated grape. Vineyards are often located near woodlots where wild grapevines grow, which provides unmanaged habitat where grape berry moth can reproduce. Growers and pest management specialists have found that grape clusters at vineyard borders are typically more infested than those growing within the interior. Therefore, cutting wild grapevines to reduce infestations has been suggested as a pest management strategy. Similar programs targeting wild hosts and abandoned orchards have been very successful for other insect pests such as the codling moth in apples, but until recently, the impact of cutting wild grape on pest pressure by grape berry moth had not been studied.

Researchers in Michigan (Jenkins and Isaacs, 2007) attempted to evaluate the effects of alternate host removal on grape berry moth infestation levels by eliminating all wild grapevines within 60 m of adjacent vineyards. But what they found was that this very intensive work had little impact on the level of infestation at harvest. One of the reasons for this may be due to the ability of moths to move between habitats. Studies using pheromone traps show that grape berry moth males can fly more than 100 m between woodlots and vineyards; females may also move these distances in search of suitable hosts on which to lay their eggs.

So what is the message here? In short, growers should not invest the time and labour required to cut wild grapevines in woodlots near their vineyards. Wide-scale, county level removal of wild grape might have some impact on pest numbers; however, this could also have negative impacts on the overall the health and diversity of the woodlot community, including numbers of natural enemies for grape berry moth and other insect pests. A better solution to managing grape berry moth infestations is to invest in regular scouting, making timely application of insecticides or adopting area-wide mating disruption of adults.

Paul E. Jenkins and Rufus Isaacs. 2007. Cutting wild grapevines as a cultural control strategy for grape berry moth (Lepidoptera: Tortricidae). *Envir. Entomol.* 36(1):187-194.

Part 2: Improving Weed Management in Young Trees (Preplant/early spring)

Leslie Huffman, Weed Management Specialist (Horticultural Crops), OMAFRA

Poor weed management can reduce performance of a new orchard for many years. Planning your weed management strategy for the planting year is important to maximize your investment. Here are 4 suggestions to begin reducing and managing weeds in young trees:

- **Weed Reduction / Avoidance in the Preplant Year:** Select fields with low weed pressure, or use a crop rotation that reduces weeds (e.g. field corn, winter cereals or green manure crops). Control perennial weeds with a 2 year strategy, targeting the most sensitive growth stage e.g. early bud in thistles, flowering in vetch. Plant a cover crop to smother weeds, especially in the fall before planting – this will prevent winter annuals from establishing. Use herbicides to control weeds in cover crops e.g. 2,4-D in wheat, or glyphosate in the spring to kill the cover crops. Mow weeds before they go to seed, especially around the field edges and in neighbouring ditches. If desired, sod can be established in the previous year and rows burnt out with glyphosate or flaming – ensure a weed-

free strip at least 1.5m wide to avoid competition from the sod. **Caution:** Avoid herbicide residues by choosing low rates or non-residual herbicides.

- **Before Planting Trees in the Planting Year:** Choose between tilling to prepare the planting row *OR* using a burndown herbicide to clear early weeds. Assess your soil organic matter (OM) level – a 2% OM is required to safely use most soil applied herbicides. In Ontario, if soil OM > 2%, Sencor, Treflan or Bonanza, or a tank-mix can be incorporated before planting (PPI) to reduce weeds.
- **Plant Trees in Straight Rows:** Aside from appearances, straight rows ensure that orchard equipment like mowers, herbicide booms, flammers, or tillage tools can work close to the trunks.
- **Mulch after planting:** Mulch can be applied around each tree to suppress weeds and conserve moisture. A 10-15 cm (4-6 in) layer of settled material is required to do the job. Scout for rodents, and pull mulch back away from trunks in the fall. As well as straw, wood chips or other organic mulches, black plastic, landscape fabric, geodisks and even discarded carpet or newspapers have been used successfully. Note that where organic mulches are used, nitrogen levels in the trees need to be monitored as they break down, and extra fertilizer may be needed after a year or two.

There are many steps to a successful weed management program in new orchards, but the improved growth and early yield and fruit size makes it worth the expense and effort. Good luck with your next planting!

