

# Grape pest review

## A dynamic ecosystem

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# Looking back at 40+ years of Grape Production and Pest Management

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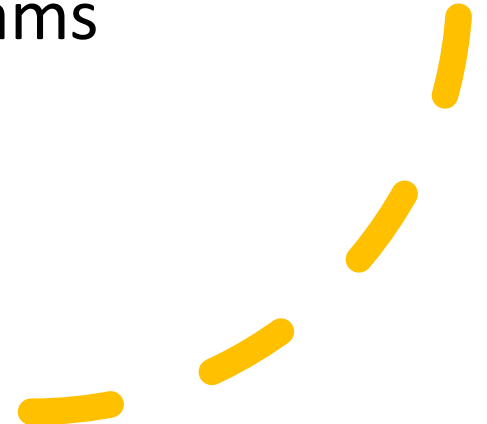
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# A bit of History from the 70's

- Building upon those people that started the path for IPM
- Agriculture Canada (CDA) Vineland
  - Entomologists, Pathologists, Virologists, Nematologists, Pesticide Application Engineer, Biologists, .....
- HRIO Vineland
  - Grape Breeding, Nutrition, Soil Scientists, Irrigation, .....
- Extension Services – Advisory Services (ODA-OMAF-OMAFRA)
- Colleagues across Canada
- OGGMB-GGO contributions

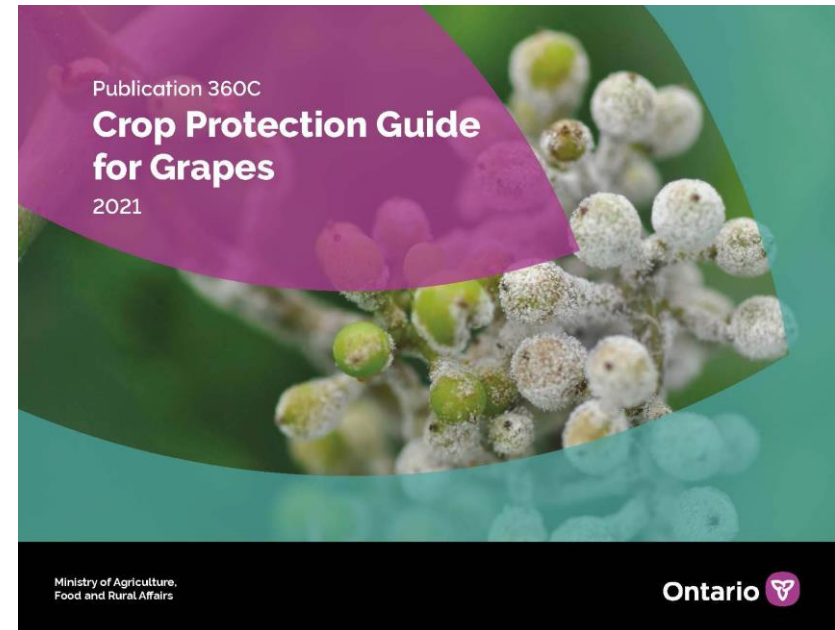
# Getting the information out to Growers

- One on one discussions
- Farm demonstrations
- Publications 360 aka The “Spray Calendar”
- Conventions
- Newsletters
- Agriphone – “Dial A Spray”
- Grower “Night School”
- Beginning of Regional PM programs



# Tech transfer

- Training of scouts across Ontario
- Diagnostic Clinics
- Monitoring – Grower Funded
- Field Trials
- Web pages
- Blogs
- Zoom meetings
- Phone apps
- And what is next to be imagined ????????





# Monitoring changes

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- “boots on the ground”
- Use of pheromones and sticky traps
- Weekly site visits by students trained in pest monitoring
- Leaf wetness monitoring and modelling
- Pathology advancements
- Area validations
- Block specific recommendations





# Monitoring changes

- Testing new Pesticide application techniques and enhancing calibrations
- Aerial imaging and satellite imaging
- Use of drones to cover greater areas – Estimation of impact
- Advanced diagnostics – Virus testing, etc.

# Major pests 1970's

Grape Berry Moth

Phomopsis and Eutypa

Downy Mildew

Powdery Mildew

Black Rot

Botrytis







# The 1980's



Expansion of IPM program for grapes

NAFTA 1988 – removal of '000s of acres of hybrid and labrusca

Vinifera planting and use of rootstocks – Phylloxera!

Early 80s still relying on broad spectrum products but first major signs of pesticide resistance noted

Adapting pest control strategies to reflect cultivar changes



# Change in Control strategies

- GBM regional monitoring created specific timing of insecticide applications
- Beginning of changeover from OP based broad spectrum insecticides to more specific products
- Understanding of susceptibility of vinifera grapes to multiple diseases and “newer insect pests” became better known under Ontario conditions
- Beginning of use of products with “kick back” and systemic properties to achieve better control of diseases
- With substantial increase of planting of grafted vines , control of Crown Gall became much more important

# The 1990's

Awareness of winter injury and crown gall  
(Big winter injury in 1993!)

Use of more selective pesticides

Resistance issues becoming more apparent

More pesticide restrictions  
(longer PHI, REI , Worker safety etc.)

Rapid increase in vinifera planting  
throughout the decade



2000's onwards



# 2000's onwards

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- Invaders
- New production areas and new pests for grapes
- Return of the Zombies – old pests make resurgence
- Revisiting opportunity
- Game changers



# MALB 2001



Good Bug Gone Bad!

Compromised wines

No registered controls

Thresholds?

Why was it bad?

What do we do ?



# Sour Rot Complex



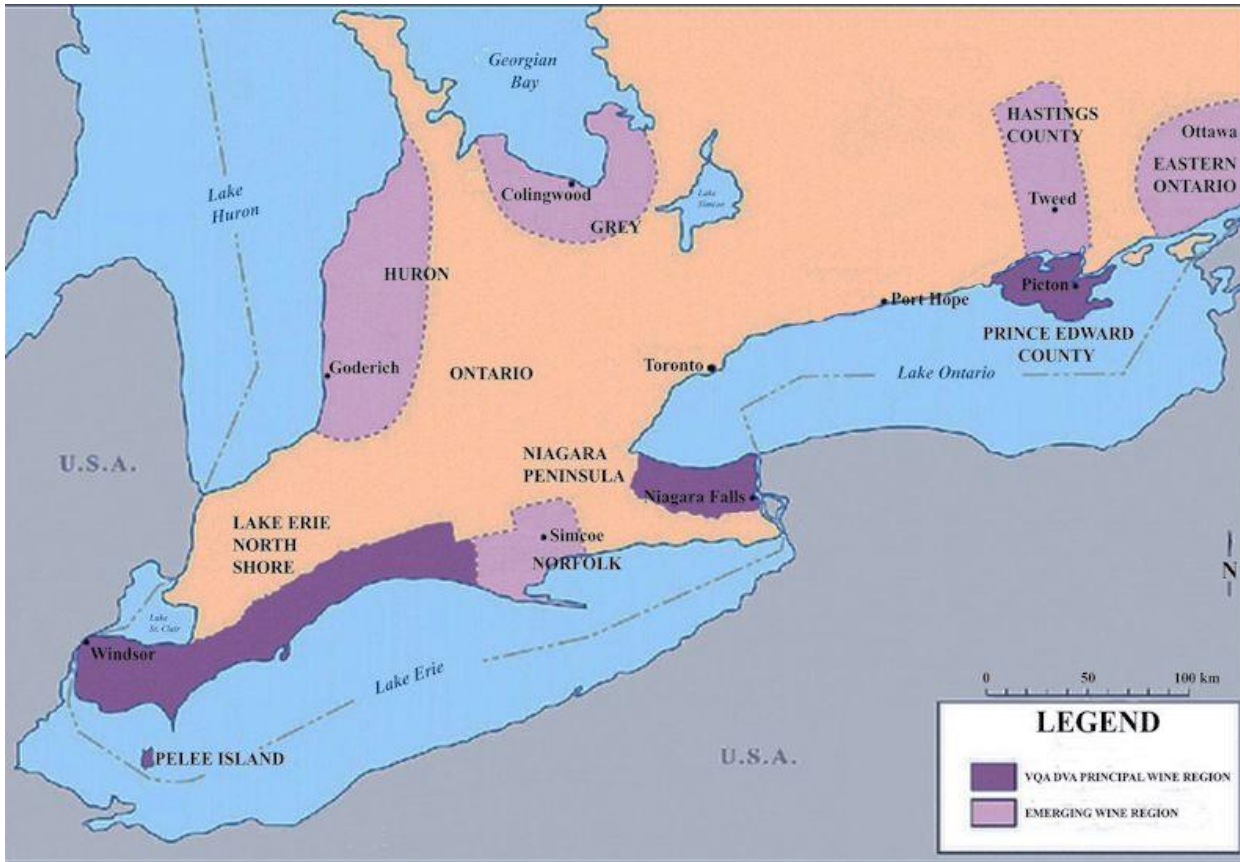
Call the Pathologists!!!!

Multiple organisms

Triggers?

What do we do ?

# New Considerations – New areas



Yellowjackets/ wasps

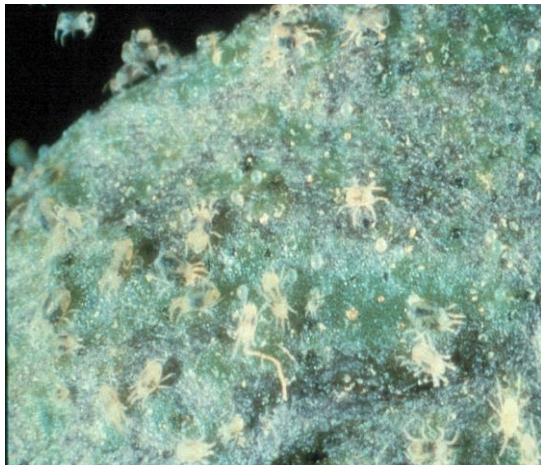
Flea Beetles

Cutworms

Herbicide residues

Map from [www.winesofcanada.com/ontario](http://www.winesofcanada.com/ontario)

# The Zombies awaken !!!!!



Scale Insects

Mealybugs

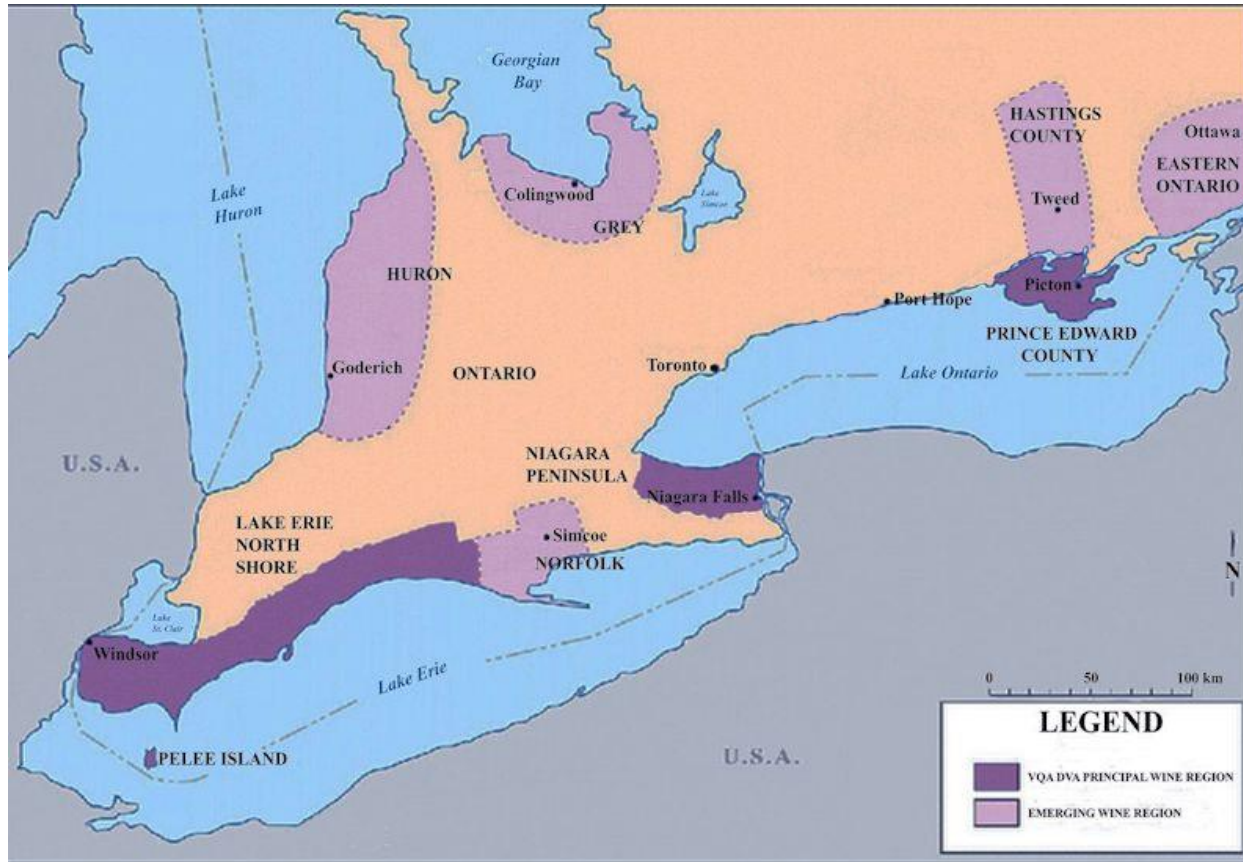
Phylloxera

Mites of all types ( ERM, TSSM, Erineum)

Anthracnose



# The latest hot issues



Virus issues

Clean Plant Material

New strategies and materials

New pests on our doorsteps!

Spotted Lantern Fly

Map from [www.winesofcanada.com/ontario](http://www.winesofcanada.com/ontario)

# Grapevine Virus Diagnostics

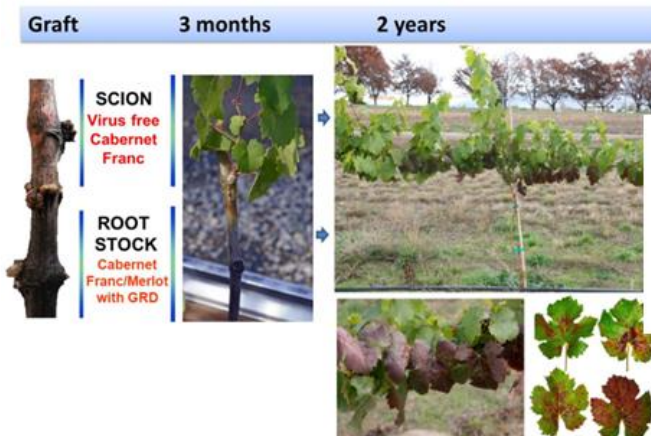
## Symptom Based

Non-specific  
Inaccurate



## Biological Indexing

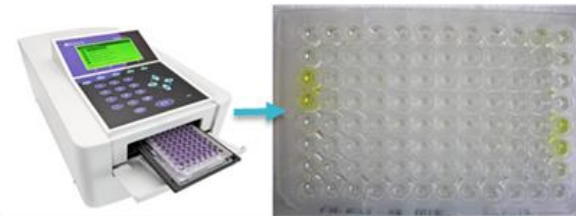
Symptom based  
Labor intensive  
Time consuming



Poojari et al. 2013. PLoS ONE 8(6): e64194

## Serological (ELISA)

Specific  
No Abs for all viruses  
Less sensitive than PCR



## Molecular (PCR, qPCR, ddPCR & NGS)

Highly specific  
Post-PCR process  
Multiplex  
End-Point  
Quantitative



www.bio-rad.com

Where are we now and where are we going ?



The incomplete list  
that only seems to  
get longer !

- Grape berry Moth
- Leafhoppers
- Cutworms, hornworms
- Scales
- Mealybugs
- Mites
- Leaf miners
- Spring-feeding pests
- Flea beetles
- Crown Gall
- Eutypa and Phomopsis
- Downy Mildew
- Powdery mildew
- Botrytis
- Sour rot complex
- Anthracnose
- Virus complex
- Invaders ???

# What lies ahead?



1. Remember the past

2. Experience should never  
be dismissed as “old school”

3. Be a mentor

4. Think outside the box

5. Never be afraid to ask a  
question



## Learn from the past

- MALB – Multicoloured Asian Lady Beetle
- Botrytis and Sour Rot Complex
- Resurgence of scale and mealybug  
Virus surge – Red Blotch and many others identified

## Old dogs can learn new tricks

- Expansion of grape growing across Ontario to new regions
- South Coast, Prince Edward County, Ottawa, Georgian Bay, Huron County....
- Low impact pesticides, biological materials
- expansion of Organic and Biodynamic production systems

Be Aware of  
the  
“enemies on  
the horizon”

- Waiting nervously for Spotted Lantern Fly – not here yet but very close by in US border states
- And ??????????????



“I have learned more from my many failures than I ever did on being successful the first try !”

“ The courage to continue is what distinguishes success from failure !”

“True friends are your fiercest critics and strongest defenders !”

# Thank you - to those who led the way !

(and still are today!)



AAFC – HRIO- UG

Brock CCOVI - Researchers,  
Colleagues, and Students  
near and far

Growers, Industry,  
Mentors, Friends across  
Canada and Internationally

Wendy McFadden Smith  
and Ryan Brewster