ISSN 2291-5907



ORCHARD NETWORK

For Commercial Apple Producers

VOLUME #17, ISSUE #4 December, 2013

In this issue...

Editor's Comments

With harvest 2013 finally wrapped up, it's time to focus on reporting, analyzing, learning and planning. Many apple growers have been planting new high density orchards, improving storages and looking for market opportunities. This issue of Orchard Network brings you up to date on the many research and demonstration projects that the Ontario Apple Team has been working on to help you and your future orchards.

Orchard Management

Precision Cropload Management – Is the Counting Worth it?

Leslie Huffman, Margaret Appleby, Kristy Grigg-McGuffin, OMAF/MRA

Precision pruning, precision thinning and precision cropload management have been proposed to help growers achieve high and consistent yields. Growers are generally reluctant to invest much time in detailed measurements, so we tested 3 techniques (precision pruning, fruitlet thinning assessment, and cropload counts for return bloom) on our highest paying cultivars, Honeycrisp, Ambrosia and Gala.

Con't on pg 2

Ministry of Agriculture and Food
Ministry of Rural Affairs
Ontario

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This issue of the **Orchard Network Newsletter** was compiled by Carolyn Prieur, Client Service Representative, OMAF and MRA, Vineland Station

In 2013, we tested the concept of **precision pruning** to determine if we could reduce the need for chemical and hand thinning by pruning to a target number of buds. First we calculated how many buds per tree were needed to achieve our target yield (with a factor of 1.5 to 2 added in the case of frost).

Cooperating growers with well-managed high density orchards pruned their trees to what they deemed an acceptable level (note that in general, pruning was severe in response to heavy budset post-frost in 2012). We then counted the number of buds remaining in several trees, and compared to the calculated number needed for yield goals. The results showered that even after heavy pruning, there was 150- 200% of required buds left, which encouraged growers to further remove branches and bud load.

Precision thinning may require multiple applications of thinners if the desired level of thinning is not achieved. The challenge with repeated applications of chemical thinners is the need to judge the response early enough that remaining fruitlets are still small enough and susceptible to subsequent applications. Research has shown that fruitlets affected by thinners will either stop growing or grow more slowly. This growth effect can be measured within 6 days after application, even while there is no obvious colour change and drop for at least 10 days. To evaluate this Fruitlet Growth Model, we measured fruitlets at 3 and 6 days after thinning to determine their growth rate. We measured after the first thinner and where applicable, after the second application. By Day 6, the measurements indicated how many fruitlets would drop (by a slower or zero growth rate), even though there was no visible difference. Cooperating growers are interested in using this technique in 2014 to make decisions on repeat applications.

Achieving the **correct cropload** on young trees is critical to achieve early but consistent yields. In 2013, we tested two tools that measure the proper cropload – the Equilifruit disk and the Cornell Young Tree Ruler. We selected younger but fully cropping Gala, Ambrosia and Honeycrisp (Note that the Cornell ruler was developed specifically for Gala and Honeycrisp). The trees were marked, number of fruit counted, and trunk diameters were recorded. Some orchards carried too much crop according to the tools, while others were carrying the correct cropload according to the tools. In 2014, return bloom and cropping will be evaluated and compared to 2013 croploads. This will indicate if these tools are useful in our climates for these cultivars.

A Brief Summary of Apple Research Projects

Dr. John Cline, University of Guelph, Simcoe

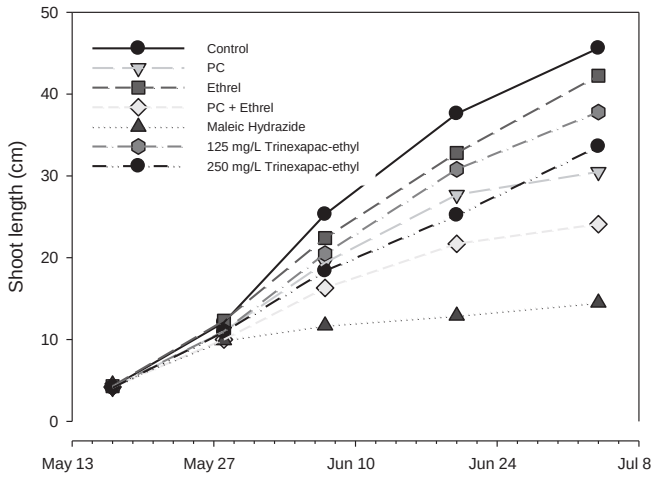
Vegetative Growth Control of Apple Trees - John Cline

Objectives

- To determine the vegetative growth response of apple trees to various plant growth bioregulators in a crop loss situation
- To determine the vegetative growth response of apple trees to new novel plant growth bioregulators

Summary of Results

- Apogee (PC) provided typical (30-40%) growth control.
- In 2012, more than three applications of Apogee were required to provide season long control
- Ethrel (ETH) alone or Ethrel and Apogee provided superior control in 2012
- Vegetative growth effects were localized
- Combinations of Ethrel and Apogee should be considered for high density orchard (pending registration)
- In 2013, Ethrel at 400 mg/L did cause some fruitlet drop, however overall drop was similar among treatments
- Significantly less time was required to dormant prune trees with reduced growth in the spring of 2013. Assessment for 2014 is pending.



Status: Project near completion and data being analysed, report being prepared

Physiology of Fruit Drop Following Repeat Sprays of Sevin or NAA following tank mixes of Sevin and MaxCel - John Cline

Chemical thinning of apples is necessary to reduce the crop load and enhance fruit size. Sprays of MaxCel, Sevin, and NAA are applied when fruits are 8-14 mm in diameter. Tree response often takes 7 days and is related to many factors including weather and cultivar. Often, repeat sprays of Sevin, NAA or Ethrel 7 days following initial spraying is desired, but the effect of these second sprays is not predictable.

Objectives

- To determine the efficacy of Sevin, MaxCel, or tank mixes of Sevin plus MaxCel on thinning of Gala when applied at 8 mm
- To determine the effect of a second application of Sevin or MaxCel, when applied 7 days after the above sprays, on fruit set
- To document the periodicity of fruit drop during the 'June' drop period

Status: Project ongoing—to be completed by March 2015

Evapotranspiration-based Irrigation Scheduling of High Density Apples - Derek Wright (MSc. Graduate Student), John Cline

Objectives

- To develop trickle irrigation scheduling technology for tree fruit growers that is responsive to the changing environment (rainfall, temperature, solar radiation, etc) and plant demands.
- To verify the agricultural and environmental benefits of this system over other irrigation practices and technology currently in use in Ontario.

Status: Project ongoing. Will be completed by March 2015

New for 2014 – NC-140 Apple Rootstock Planting – John Cline and John Zandstra

Objectives

- To determine the horticultural attributes of several new Vineland and Cornell-Geneva size controlling rootstocks with Honeycrisp (Simcoe and Cedar Springs) and Aztec Fuji (Simcoe) as the scion cultivars.

Method

- Ten trees each of Honeycrisp and Aztec Fuji on 17 different rootstock (B.10, G.11, G.202, G.214, G.30, G.41, G.5890, G.935, G.969, M.26 EMLA, M.7, MM.106, M.9 T337, V.5, V.6, V.7) will be planted in 2014 at the University of Guelph, Simcoe (Cline) and Cedar Springs (Zandstra) Experiment Stations. Trees will be planted using a spindle type training system and trickle irrigated. Trees will be monitored for trunk circumference growth, tree height and spread, yield, fruit size, rootstock suckering and longevity.

Status: Project will be initiated in 2014 and end in 2023.

These projects are supported by the OAG and/or OMAF and MRA at the University of Guelph, Simcoe. For more information visit www.plant.uoguelph.ca/treefruit/

Apple Research at Cedar Springs Research Station

John Zandstra, University of Guelph, Ridgetown

Performance of Honeycrisp on Dwarfing Rootstocks

An orchard of Honeycrisp on 9 dwarfing rootstocks covering a range of vigor (B9 to M26) was established in 2002 to evaluate this newer variety. The trial was completed in 2009 and results have been in previous newsletters.

Evaluation of Rootstock Effects on Bitter Pit of Honeycrisp

The 2002 planting of Honeycrisp on 9 dwarfing rootstocks is being maintained to document differences in bitter pit incidence across rootstocks. It has been suggested that a more vigorous rootstock would result in more bitterpit, but we could find no data to support this. We now have 2 years of data (samples from 2013 are in cold storage for further evaluations). We have not observed any significant changes across the range of rootstocks; however, bitter pit incidence has been low. We are continuing this trial, and also expanding bitter pit research into looking at irrigation/groundcover management and its influence on this problem.

Pruning and Training Strategies for Establishing Ambrosia Orchards

A high density planting of Honeycrisp and Ambrosia on B9 was established with 12 ft rows and in-row spacings of 2', 3' and 4', to create 3 trees densities (907, 1210 and 1815 trees/acre) for evaluating potential mechanization in the future. All trees were grown from whips. The Ambrosia trees developed the typical U-shaped upright

lateral branches, which makes it a challenge to fill their assigned space in the orchard. To evaluate whether lateral branches should be pruned out and/or trained horizontal, we worked with Leslie Huffman to use different pruning and training techniques for lower and upper tiers of scaffolds. Observations in the spring of 2013 suggested that removing 1 large lower branch and training all upper laterals to horizontal starting in the 2nd year provided a tree with the best form and highest yield potential. This pruning approach appeared to work well in the 2 ft and the 3 ft in-row spacing.

Acknowledgements of funding: Ontario Apple Growers, Michigan Apple Committee, Agriculture and Agrifood Canada CAAP program, Eastern Ontario Fruit and Vegetable Growers Association

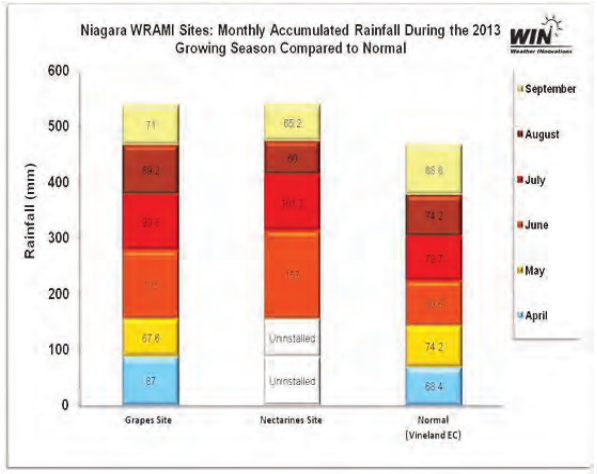
The Evaluation of Soil Moisture Monitoring Devices in Tree Fruit

Kathryn Carter, Rebecca Shortt, Margaret Appleby, Leslie Huffman, Kristy Grigg-McGuffin, OMAF/MRA

Insufficient moisture is a major weather risk for tree fruit and grape growers. Access to water during important physiological stages of tree and fruit growth is required for optimal performance of fruit crops. Shortage of moisture during critical periods of crop growth and fruit development affects both yields and sizing of produce, affecting the volume of production and average price of fruit. With erratic weather patterns increasing, availability of water is becoming more critical for growing quality fruit. Growers who are using irrigation in their orchards (or vineyards) need information on how and when to irrigate, and need to be able to assess the soil moisture levels in their orchards. Currently growers have little information available on the soil moisture monitoring tools available for monitoring orchards and vineyards. Soil type can have significant impacts on the usefulness of soil moisture probes (i.e. probes with soft metal prongs can bend and break in hard clay soil conditions).

The objective of this project is to provide growers with information regarding the accuracy, cost and user friendliness of various different types of soil moisture monitoring devices under various different soil types and growing regions.

A total of seven fruit orchards (tender fruit and apple) across the province and 4 vineyards (Niagara) were monitored daily throughout the season to record soil



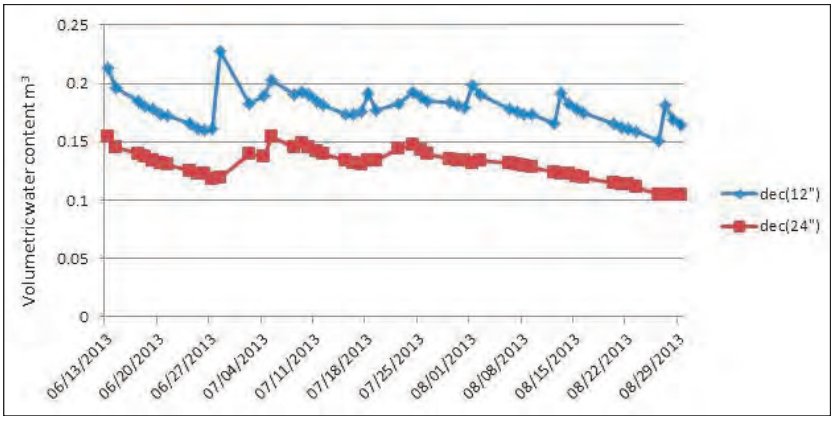


Figure 2 Soil moisture readings from Decagon EC 5 located in an apple orchard in Ruthven with sandy loam soil. Sensors were placed at 12" in depth and 24" depth.

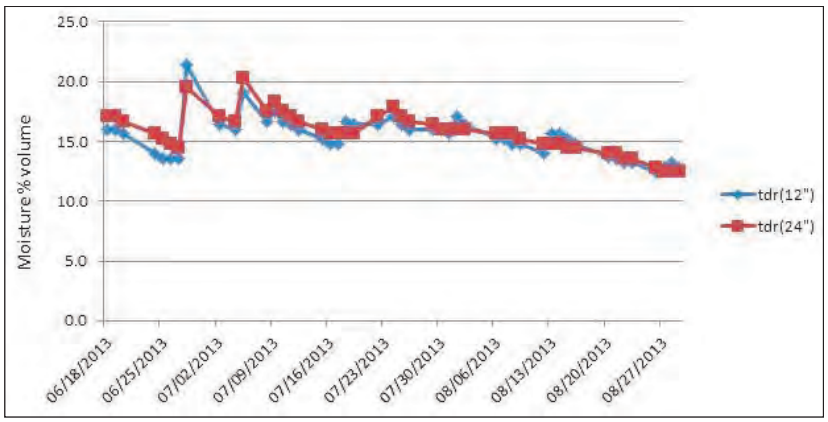


Figure 3 Soil moisture readings from a GroPoint TDR located in an apple orchard in Ruthven with sandy loam soil. Sensors were placed at 12" in depth and 24" depth.

moisture levels. Sites had a variety of different soil types, and were set up to use either overhead or drip irrigation. A variety of soil moisture testing devices were evaluated at each site including tensiometers, Time Domain Reflectometry (TDR) and volumetric water content sensors. Monitors were evaluated on their accuracy, ease of use, longevity and cost. Some of the probes were set up to provide real time data that was posted on individual growers' Fruit Tracker website. We also evaluated C probes from Weather Innovation Network.

The 2013 growing season had considerable rain (Figure 1), so only 2 of the 12 growers used irrigation. The various soil moisture probes provided considerably different numerical results with respect to soil moisture levels. The data we collected did indicate similar trends in soil moisture levels at each site using some of the different probes (Figure 2 and 3). There were differences with respect to ease of use of the different probes. The results of this project will be presented at the upcoming Ontario Fruit and Vegetable Convention. The project will be continued in 2014, and we hope to post the information on a website.

Biofumigant Cover Crops for Apple Replant Sites

Anne Verhallen, Soil Management and Leslie Huffman, Apple Production, OMAF/MRA

Biofumigant cover crops can control nematodes if establishment, weed control and incorporation are effective. These trials were established in Norfolk and Essex Counties to further determine if the fumigant action of mustards or pearl millet would also reduce the many causes of Specific Apple Replant Disease (SARD). These treatments are compared to fumigation and/or fallow treatments.

With cover crops established in 2010, and orchards established in 2011, these replant sites will begin to have significant crops next year and may show a response to the cover crop treatments. Each year, we have measured tree growth, and in 2013, we also recorded bloom data where present. We also resampled each plot in Fall 2013 for nematode analysis, and results should be available in the New Year.

Apple Profiling at Vineland: How Bridging Sensory, Consumer and Biochemical Evaluations Could Lead Us to the Next Ideal Apple

Beatrice Amyotte, Graduate Student, Applied Genomics, Vineland Research and Innovation Centre

Winter 2014 will mark the completion of a large-scale sensory, biochemical, physical and genetic apple evaluation research project at Vineland Research and Innovation Centre. This research, initiated in the summer of 2012, was designed to understand which quality traits in apple are most important to Canadian consumers, and to then identify how these traits arise from the underlying biology of the fruits.

Fifty of the seventy diverse apple varieties evaluated were selected from amongst a heritage collection at Vineland, while the remaining twenty were selected from amongst the most popular commercial varieties sold in North America.

Sensory profiling was conducted under the direction of Dr. Amy Bowen, Program Leader Consumer Insights Group at Vineland, using a trained tasting panel. The same apples tasted by the sensory panel were also tested analytically for mechanical fruit firmness, flesh browning, starch index, % Brix and titratable acidity using precise analytical instruments.

The results from apple profiling in 2012 allowed Dr. Bowen to select twenty apple varieties representing the diverse taste, flavour and texture attributes within both the heritage and commercial apples, and to use these apples to test consumer preference for such attributes. Consumer preference testing involved a wide cross-section of the apple buying public. Based on the information gathered from sensory and analytical results, a model was developed to predict 'ideal apple' profiles for each consumer liking group.

In 2013, sensory and analytical apple evaluations were repeated, and we added biochemical profiling of unique 'aroma compounds' emitted by each apple. The apple biochemical profiling was conducted by Dr. David Liscombe, Biochemistry Research Scientist at Vineland, in order to understand how perceived flavours and aromas correspond to the production and release of certain chemical compounds by each apple variety.

And last, the Applied Genomics Group at Vineland, led by Research Director Dr. Daryl Somers, sequenced the DNA of each heritage and commercial apple profiled. The genetic information held within the DNA sequences will allow the Genomics Group to determine how each fruit quality trait is inherited so that they can ensure that the most important traits for consumers are passed on, from parent to offspring, in Vineland's apple breeding program.

It is important to note that Vineland's attempt to apply consumer preference for perceived taste, flavour and texture attributes toward a DNA-based apple breeding strategy is very novel, and that using this approach will certainly grant both the Ontario apple industry and Vineland a significant leg up in the world of horticultural research and breeding.

This two-year apple research project is funded by the Canadian Agricultural Adaption Program, the University of Guelph – Ontario Ministry of Agriculture and Food Partnership, the Ontario Apple Growers and Agriculture and Agri-Food Canada – Growing Forward program.

Crop Protection

Powdery Mildew Fungicide Resistance Survey

Kristy Grigg-McGuffin, Margaret Appleby, Leslie Huffman, OMAF/MRA

Collections continued this year for the National Powdery Mildew Fungicide Resistance Survey, which is part of a project administered by the Ontario Apple Growers (OAG) and funded by Agriculture & Agri-Food Canada. For 2013, 16 new Ontario sites were selected from the five growing districts. As well, all 16 sites from 2012 were also re-sampled due to poor spore viability with last year's powdery mildew collections. In total, 90 growers across Canada agreed to participate in this project, including 34 in British Columbia, 32 in Ontario, 12 in Quebec and 12 in Nova Scotia/New Brunswick.

In the spring, dormant mildew-infected white shoots were collected from orchards prior to any fungicide sprays. If further collections were required, cooperating growers agreed to leave 6-8 trees unsprayed for disease. Samples were collected and sent to the Okanagan Tree Fruit Cooperative, north of Kelowna, B.C. for resistance testing to Group 3 (Nova 40W, Nustar, Funginex DC, Inspire), Group 7 (Fontelis, Luna Tranquility [Group 7+9]), and Group 11 (Sovran, Flint 50 WG, Pristine WG [Group 7+11]) fungicides.

Preliminary results indicate some powdery mildew populations in Ontario may be shifting or resistant to Nova 40W, Flint 50 WG and Sovran (Figure 1). Most powdery mildew populations tested are still susceptible to fungicides from Group 7, including Fontelis, Luna Tranquility and Pristine WG. However, since Pristine WG also belongs to Group 11, there is an increased risk of resistance development. A sound powdery mildew resistance management program should include broad-spectrum mildewcides (e.g., sulphur) and rotation between fungicide groups.

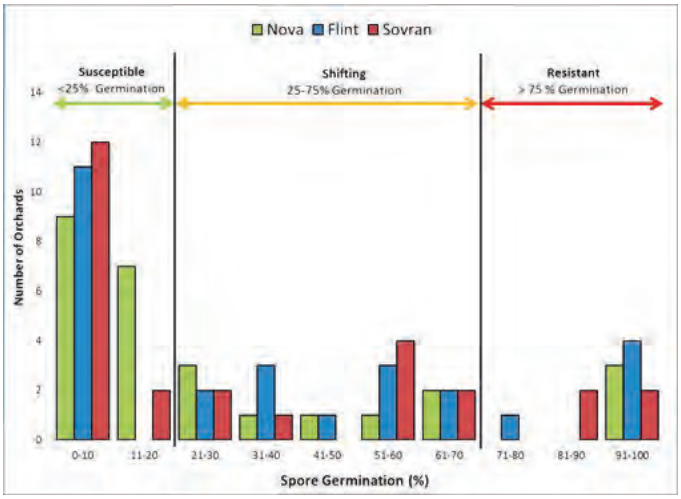


Figure 1. Distribution of spore germination of powdery mildew populations from Ontario apple orchards treated with Nova 40W, Flint 50 WG and Sovran fungicides.

We hope to have the final results for this project, including DNA analysis, shortly. Look for this information at the Ontario Fruit & Vegetable Convention in February 2014.

Monitoring for San Jose Scale

Kristy Grigg-McGuffin, Pome Fruit IPM, OMAF/MRA

San Jose scale (SJS) is a difficult pest to control within apple orchards due to their biology. There are a few spray timing options, but most require knowledge of when the crawlers have emerged and are most vulnerable. Dormant oil applications can be very effective by targeting the immature scales before they develop a protective waxy layer. However, good coverage and timing are essential with the use of oils since they smother the crawler but have no impact on adults. New products have been registered recently targeting the summer generations of SJS, but label recommendations state correct spray timing to be "when crawlers are active" and growers are struggling to predict this timing.

A better understanding of both insect activity and development is required so that growers and consultants can optimize the use of new products and manage insect damage throughout the year. Due to the lack of management tools tested in Ontario to monitor this pest, appropriate timing for summer control strategies is unknown. The objectives of the 2013 project were to evaluate the efficacy of commercially available trapping systems and degree day models to optimize timing of insecticide sprays against SJS.

For more information on methods and results, see the September 2013 Orchard Network Newsletter, titled Monitoring for San Jose Scale.

Management of Apple Leafcurling Midge

Kristy Grigg-McGuffin, Margaret Appleby, OMAF/MRA

In recent years, Ontario field trials using Movento have been quite successful in the management of apple leafcurling midge (ALCM) when applied at petal fall. In 2013, field trials expanded to include alternative products, Closer and Delegate.

Pheromone traps were installed at pink in a Durham region orchard with historically high ALCM pressure. When the cumulative catch of adult midges in the traps exceeded 10, which corresponded with petal fall, the following insecticides were applied:

- Delegate @ 420 mL/ha
- Closer @ 400 mL/ha
- Movento @ 365 mL/ha

As shown in Figure 1, Closer and Delegate treated blocks has less terminal damage caused by ALCM one week after treatment compared to Movento. Due to its mode of action, Movento is a slower acting product and typically

takes 2-3 weeks for effects to become evident. However, residual activity is longer lasting for this product, as seen by week 4 in this orchard. However, it should be noted that in this trial, Closer was applied 3 days earlier than the other products, which could explain the higher damage in that block by week 4.

Trials will continue in 2014 to find effective products and appropriate spray timings for this pest. The OMAF and MRA Apple Team are also involved in an ALCM parasitoid project. Collections next season will determine if native parasitoids are present in Ontario apple orchards, while laboratory tests will survey other parasitoids that could potentially be used as biological control for ALCM.

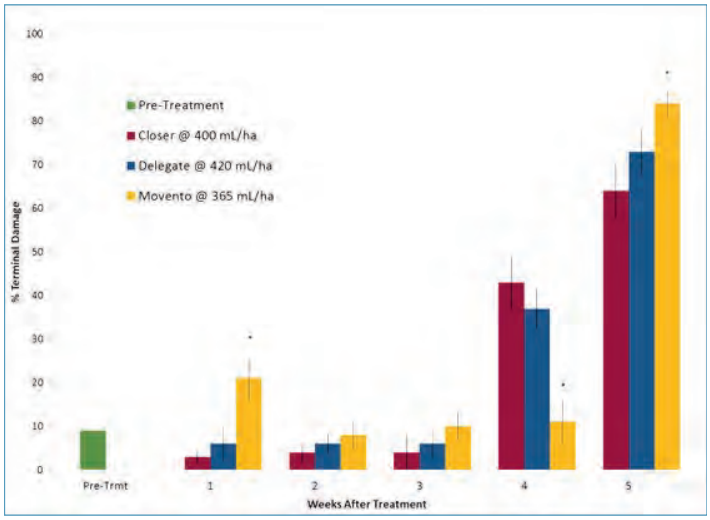


Figure 1. Apple leafcurling midge terminal damage following petal fall insecticide spray, 2013. * represents significant difference between treatments that week.

Bitter Rot Survey in Ontario Apple Orchards

Kristy Grigg-McGuffin, Michael Celetti, Margaret Appleby, Leslie Huffman, OMAF/MRA

In recent years, spots on maturing apples caused by bitter rot (*Colletotrichum acutatum* and *C. gloeosporiodes*) have been observed across the province, particularly on Empire, McIntosh, Gala, Honeycrisp, Ambrosia and Golden Delicious. For a detailed description of this disease and some commonly mistaken disorders, see Hort Matters Volume 12 Issue 30 article, titled Glomerella leaf blotch and bitter rot in Ontario apples.

This year, the OMAF and MRA Apple Team conducted a survey of the five apple growing districts to determine the distribution and severity of bitter rot (and the leaf symptoms, known as Glomerella leaf blotch) in Ontario. Orchards were selected based on symptoms observed in recent years. Symptomatic fruit and leaves were collected from 1-2 varieties in each orchard, totalling 40 samples across Ontario. Collections were sent to the University of Guelph Pest Diagnostic Lab for disease confirmation. As well, varieties in each orchard were also surveyed for disease severity based on fruit and leaf damage ratings and classified as low, moderate or severe disease pressure.

Overall, Districts 2 and 5 had the highest bitter rot pressure, with symptoms present on both leaves and fruit (Figure 1). Districts 1, 3 and 4 did have some low to moderate disease pressure in those orchards surveyed, though it was mainly leaf symptoms that were observed. Surveys will continue in 2014 to learn more about the biology of this disease, cultivar susceptibility and potential control options.

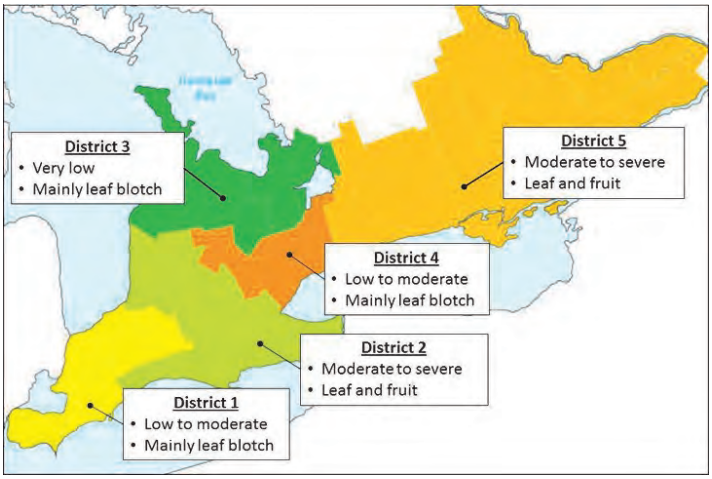


Figure 1. Bitter rot and Glomerella leaf blotch survey disease pressure ratings by Ontario apple growing district, 2013.

Black Rot in Apples

Michael Celetti, Plant Pathologist Horticulture Crops, OMAF/MRA

Several apple growers have noticed a higher incidence of black rot on harvested fruit this past season. Black rot is caused by the fungus *Botryosphaeria obtusa* and can cause symptoms on leaves, fruit and wood. For a detailed description of the disease cycle and symptoms, see Hort Matters, December 12, 2013.

There may be several reasons that contributed to the increased incidence of black rot observed in some orchards during 2013. The reduced summer disease fungicide spray program in 2012 may have allowed this disease to get established. Summer fungicides to protect fruit probably protect tree wounds as well, which means less cankers and less inoculum in the orchard. Warm temperatures with frequent rainy and prolonged wet periods experienced this past summer in some apple growing areas was conducive for fruit infection earlier in the growing season. Orchards in close proximity to wooded areas are at more risk of infection because trees in these woodlots could be a source of the pathogen for nearby apple orchards.

Management of black rot relies upon good sanitation practices together with a summer disease fungicide program. Pruning out diseased limbs and dead wood is an important practice to reduce the inoculum sources within the orchard. It is important to remove the prunings from the orchard or burn them since the fungus can survive and produce spores on dead tissue. Alternatively, chopping up the prunings on the orchard floor with a flail mower will also reduce inoculum levels without the hassle of removing them from the orchard. Since mummified fruit often left in trees become infected with the fungus and remains as a source of inoculum within the orchard, the removal of mummified fruit will also help reduce the potential of the inoculum building up. Summer disease fungicide sprays with Captan or Maestro starting as early as silver tip and continued on a 10 to 14 day schedule depending upon weather will protect the fruit from becoming infected and developing black rot.

Black rot symptoms first appears as black spots on fruit close to harvest.

Publication 360 Update

Kristy Grigg-McGuffin, Margaret Appleby, OMAF/MRA

The 2014-2015 Publication 360, Guide to Fruit Production is anticipated to be available for growers mid-March 2014. This will have the latest information on pest management, crop nutrition, pesticide safety, resistance management and thinning tree fruit. New this year are more reference tables, including crop groups and degree-day models, new organic and biopesticides section, and new products added to the apple, berry, grape, tender fruit and tree nut calendars.

Along with label expansions to include new insects or disease to currently registered products, the following new products for apples will be included in this publication.

New products for disease management :

Product	Scab	Powdery mildew	Rust	Black rot	Bitter rot	Fly speck	Sooty blotch	Fire blight
Folpan 880 WDG	X			X		X	X	
Granuflo T	X		X	X	X	X	X	
Thiram 75 WP	X		X	X	X	X	X	
Fontelis	X	X	X					
Luna Tranquility	X	X						
Inspire Super	X	X*	X			X	X	
Syllit 400 FL	X							
Kasumin 2L								X
Blossom Protect								X

* Suppression only

New products for insect management:

Product	Rosy/green apple aphid	Woolly apple aphid	Tentiform leafminer	Spring feeding caterpillar	European apple sawfly	Plum curculio	Obliquebanded leafroller	Oriental fruit moth	Codling moth	Apple maggot	White apple leafhopper	Japanese beetle	Dogwood borer	Scale	Brown marmorated stink bug
Exirel	X		X	X	X	X	X	X	X	X	X	X			
Closer SC	X	X*												X	
Isomate DWB													X		
Lannate Toss-N-Go															X

* Suppression only

European Apple Sawfly Update

Margaret Appleby, IPM Systems Specialist, OMAF/ MRA

Invasive species like brown marmorated stink bug and spotted wing drosophila, have grabbed our attention recently, but another invasive species, European apple sawfly (EAS) has been in North America since the 1940's. This direct pest of apples moved slowly north and westward since its introduction, and can now be found in apple orchards in the Maritimes, Quebec, and Northern New York State. In 2011, this pest was also found in Michigan. In Ontario, we have been monitoring its spread since the late 1980's and damage to date has been reported as far west as the Barrie area. Where European apple sawfly is present, growers have to be diligent in applying insecticides before or after bloom to ensure no damage. From full pink to petal fall, EAS is present as an adult and lays its egg into the base of the blossom. The egg hatches and larva starts feeding on the small fruitlets which then drop (a natural thinner). Alternatively, if the larva dies before going to the seed cavity, the damage appears as a spiral russetted ribbon on the skin of the fruit at harvest. Azinphos-methyl was the only registered insecticide for this pest and because of the loss of this insecticide, efforts were made to fill the gap. Today, products from two insecticide groups, Assail and Calypso, (Group 4) and Exirel and Altacor (Group 28) (petal fall only) are registered for this pest. Research is ongoing to look at biological control agents and organic products to manage European apple sawfly.

Postharvest

Soggy Breakdown in 'Honeycrisp' Apples

Dr. Jennifer DeEll, Fresh Market Quality Program Lead – Hort Crops, OMAF/ MRA

'Honeycrisp' apple is extremely susceptible to soggy breakdown. This physiological disorder is distinguished by soft, brown, spongy tissue within the fruit cortex (Plate 1). In severe cases complete rings of brown flesh tissue can form. Soggy breakdown is a chilling-related disorder and it typically develops at storage temperatures less than 2°C. Therefore, to reduce the incidence of soggy breakdown, it is recommended that 'Honeycrisp' be stored at 3°C, but only after partial cooling (conditioning) at 10°C for the initial week of storage. This procedure will also help reduce soft scald development (Plate 2).

According to the CIPRA model (using weather data from Simcoe, Ontario) there is greater risk of chilling-related disorders developing this storage season than in the past two seasons. See associated article "Risk of chilling disorders for 2013-14 storage season in Ontario". Although the ~12% risk level may not seem very high, this is the **first time we have found soggy breakdown in 'Honeycrisp' at harvest time** (Plate 3).

In addition to low storage temperature, other factors that have been related to soggy breakdown development include advanced fruit maturity at harvest, light crops, and large fruit size. However, the most frequently mentioned factor is climatic conditions, with cooler temperature and excess moisture near harvest time tending to induce soggy breakdown.

Research by Lachappelle (M.Sc. thesis, 2011) showed that cool conditions (temperature < 5°C) and wet conditions (precipitation > 0.5 mm) during certain growth stages resulted in higher incidence of soggy breakdown in 'Honeycrisp' grown in Ontario and Quebec. The model developed to predict soggy breakdown exhibited between 68-75% of well-predicted cases. We are continuing to research this area of study and further conclusions should be forthcoming.

Plate 1: Soggy breakdown in 'Honeycrisp' after cold storage.

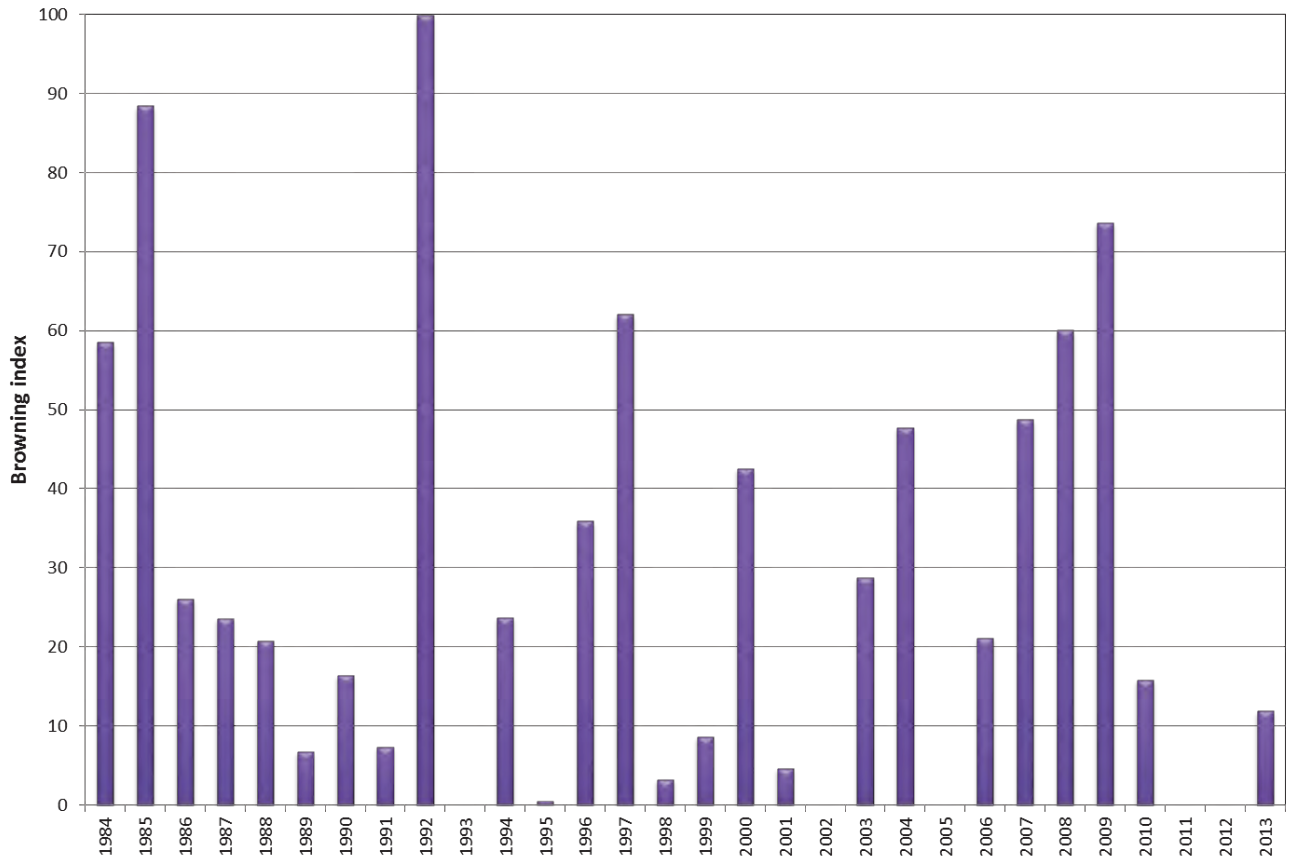
Plate 2: Soft scald in 'Honeycrisp' after cold storage.

Plate 3: Soggy breakdown in 'Honeycrisp' at harvest time.

Risk of Chilling Disorders for 2013-14 Storage Season in Ontario

Dr. Jennifer DeEll, Fresh Market Quality Program Lead – Hort Crops, OMAF/ MRA

CIPRA is a computer-based program developed by the research team of Dr. Gaétan Bourgeois (AAFC-QC) that uses weather data to predict the risk susceptibility of apples to specific storage disorders (Bourgeois, DeEll, and Plouffe). According to the model within CIPRA (using weather data from Simcoe, Ontario), there is greater risk of chilling-related disorders developing this storage season than in the past two seasons. The graph below shows risk levels from 1984 until 2013.
Regardless of varying seasonal risk, it is important to always use the recommended storage temperatures for specific apples. 'Empire', 'McIntosh', and 'Honeycrisp' are especially susceptible to chilling-related disorders (i.e. flesh browning, low temperature breakdown, core browning, soft scald, soggy breakdown) and symptoms can usually be induced by using storage temperatures lower than optimum.



* Graph supplied by D. Plouffe, AAFC-QC

Food Safety

Water and food safety

Wayne Du, On-Farm Food Safety Specialist

Water, an essential element for agri-food production, can also be a source of food contamination. Contaminated water can carry and transfer pathogens as well as chemical hazards to crops, livestock, poultry and foods. Here are some general tips to ensure water safety:

- Assess water sources for food safety risks.
- Test water through a credited laboratory at least once a year or as frequently as your food safety program requires to ensure that it meets the required quality standards.
- Treat water if it does not meet the required standards.
- Keep all records for water test results and treatment methods.

Food safety is everyone's responsibility. To attend one of our free online workshops on water quality and other important food safety topics, visit us at: www.ontario.ca/foodsafety or call: 1-877-424-1300. Food safety practices keep agri-food businesses competitive, productive and sustainable.

Announcements

Growing Forward 2 Funding Assistance Program for Producers, Organizations and Collaborations

Growing Forward 2 (GF2) is a federal-provincial-territorial program aimed at encouraging innovation, competitiveness and market development in Canada's agri-food and agri-products sector. In Ontario, farm, food and bioproduct businesses, collaborations and organizations can build their own plan and select opportunities to help grow their profits, expand their markets and manage risks.

Areas of Focus for GF2 Funding Assistance
Producers, organizations and collaborations can apply for funding assistance in six focus areas, with an emphasis on innovation:

- Environmental and Climate Change
- Assurance Systems (Food Safety, Traceability and Animal Welfare)
- Market Development
- Animal and Plant Health
- Labour Productivity Enhancement
- Business and Leadership Development

Capacity Building Funding Assistance
Cost-share is available to support eligible clients to acquire additional skills, to undertake in-depth assessments and audits, and to develop business plans. Building capacity helps prepare clients to apply for further cost-share to implement a project. Applications for capacity building funding assistance will be accepted on a continuous basis.

Some examples of Capacity Building activities are:

- Cost-share fees for qualified consultants (e.g. Professional Engineer) to conduct an assessment.
- Produce a written report and plan that provides recommendations for implementing improved irrigation and fertigation management BMP's (e.g. field and greenhouse operations).
- Energy Use Assessment for existing farm buildings that will reduce the dependency on power and fossil fuels and reduce greenhouse gas emissions.
- Prevention plan for Wildlife Damage - help reduce crop, livestock or property damage caused by managed wildlife species.
- Market Assessment, Marketing Plan, Communication Material Design.
- Integrated Pest Management Planning.
- Cost of Production Assessment.
- Succession Plans, Expansion Plans, Human Resources Plan, Business Plan.

Implementation Funding Assistance
Clients may be eligible for cost-share for projects that help to achieve their business goals. Applications for project implementation will be reviewed and assessed based on merit. Having a detailed business and/or workplan, budget and applicable permits and approvals in place prior to submitting an application will increase your success in securing cost-share.

Individual farm businesses may be eligible to receive up to $350,000 over the five-year program (April 1, 2013 to March 31, 2018)

Producers are strongly encouraged to attend a free capacity building workshop such as Canada-Ontario Environmental Farm Plan (New 4th edition) and Growing Your Farm Profits.

Important Dates:

- **June 26, 2013** – ongoing application intake for Capacity Building Funding Assistance from all eligible clients
- **October 28, 2013 to December 12, 2013** – Application intake for Implementation Funding Assistance from organizations and collaborations
- **December 16, 2013 to January 30, 2014** – Application intake for Implementation Funding Assistance from all eligible clients including, producers, organizations and collaborations

Please visit the GF2 website at: www.ontario.ca/growingforward2

OMAF and MRA have a full listing of programs and services for Ontario farmers on the website and in the Factsheet 'Programs and Services for Ontario Farmers'. For more information please visit: www.omafra.gov.on.ca/english/busdev/facts/progserv.htm or call the OMAF and MRA Agricultural Information Contact Centre to request a hard copy of the Factsheet at 1.877.424.1300.

The International Fruit Tree Association (IFTA) 57th Annual Intensive Workshop and Conference

The International Fruit Tree Association (IFTA) 57th Annual Intensive Workshop and Conference will be in Kelowna, B.C. from February 22-March 1, 2014. To register and for program details, see www.ifruittree.org/.

Note that next winter's conference has been moved up to November 2014, to coincide with Interpoma which is being held in northern Italy. Start planning now to attend!

INVITATION
4TH ANNUAL ONTARIO SWEET CIDER COMPETITION

Sponsored by: Ontario Apple Growers (OAG)
Moderated by: Leslie Huffman, Apple Production, OMAF/MRA, Harrow

It's been a great year for apples, and a great year for cider! We invite you to enter your best cider in the 4th Annual Ontario Sweet Cider Competition at the Ontario Fruit & Vegetable Convention on February 19, 2014.

Here are the details:

- Only Ontario cider producers are eligible to enter. Only one entry per business.
- Submit two 4-L jugs of cider. Entrants are responsible to ensure that frozen ciders are thawed by judging time.
- Unlabelled jugs are required. Please identify your jugs with labels attached with elastic.
- Entries will be accepted on Wednesday, February 19, 2014.
- Entries must be delivered to the exhibitors' registration desk at the Ontario Fruit & Vegetable Convention, Scotiabank Convention Centre, Niagara Falls.
- Judging will be Wednesday afternoon. Judging is open to the public.
- Winning ciders will be announced at the Farmers and Friends Reception Feb. 19.
- Tasting of winning ciders on Thursday morning (Feb. 20), by the Apple Session.
- Prizes: 1st place receives a plaque and keeps the trophy for one year. 2nd and 3rd place receive a plaque.

Tips from Bob Tritten, convener of the Michigan Cider Contest:

- Ciders can be frozen, but allow for expansion when filling.
- Practice thawing frozen cider to ensure the jug is thawed for competition time.
- Freeze samples from several batches, and select the best tasting entry later.
- Mixing apple cultivars often produces better flavours than using a single cultivar.

This competition is sponsored by the Ontario Apple Growers, with the goals to encourage excellence in cider making and to raise consumer awareness of Ontario's delicious cider products.

Other Cider Events:
The 1st Annual Ontario Hard Cider Competition will also be held in 2014 at the OFVC with a separate panel of judges. Also, plan to attend our Cider Workshop for sweet and hard cider producers on Wednesday morning, Feb. 19 in Room 205.

ONTARIO APPLE GROWERS

Ontario

Apple Cider Workshop (Sweet and Hard Cider)
Wednesday, February 20, 2014

9:30 am **New Cider Technologies: Mobile Pressing, Bag-in-Box**
Garry and Gord Geissburger, Farmhouse Ciders, Clarington

10:00 am **Making Winning Cider at Delhaven Orchards**
Hector and Mark Delanghe, Delhaven Orchards, Blenheim

10:30 am **Choosing the Right Apples for Better Ciders**
Ben Watson, Chelsea Greene Publishing, New Hampshire

11:00 am **Economic Impact Study for the Ontario Hard Cider Industry**
Nick Sutcliffe, Ontario Craft Cider Association, Caledon East

Apple Program
Thursday, February 21, 2014

9:30 am **My progression to fruiting walls and mechanical hedging**
Mo Tougas, Tougas Family Fruit Farm, Northborough, Massachusetts

10:00 am **Making AppleTracker work for you**
Matt Deir, Dragonfly IT, Kingston
Andrea Otten, Josmar Acres, Lynden

10:30 am **Introducing the 'Arctic Apple'**
Neal Carter, Okanogan Specialty Fruits, Summerland

10:45 am **Panel: Growing Honeycrisp apples**
Shane Ardiel, Apple Springs Orchards, Clarksburg
Calvin Dentz, Dentz Orchards, Iroquois
Murray Porteous, Lingwood Farms, Simcoe
Moderator: Leslie Huffman, OMAF and MRA, Harrow

Lunch & Trade Show

2:00 pm **Horticultural management of Honeycrisp apples in Washington**
Dr. Ines Hanrahan, Washington Tree Fruit Research Commission, Yakima

2:30 pm **Advances in apple storage recommenda tions and technology**
Dr. Jennifer DeEll, Fresh Market Quality Lead, OMAF/MRA, Simcoe

3:00 pm **Sorting out spots on apples**
Kristy Grigg-McGuffin, OMAF/MRA, Simcoe

3:30 pm **Current horticultural challenges for tree fruit growers in Washington**
Dr. Ines Hanrahan, Washington Tree Fruit Research Commission, Yakima

The Ontario Fruit and Vegetable Convention is an annual gathering of horticultural crop producers, primarily involved in the production of fruits and vegetables, from across Ontario. The 2-day convention is located at the Scotiabank Convention Centre in Niagara Falls, Ontario, and features a great lineup of horticultural experts, topical sessions, close to 200 exhibitors and great networking opportunities.

Hear from and network with producers, suppliers and industry experts from across Ontario, Canada and the US. Learn about new developments, upgrade your knowledge and see what's new and exciting in the industry. Now entering its 12th year, discover for yourself why OFVC is called Canada's Premier Horticultural Event.

For more information or to register visit: www.ofvc.ca

Agricultural Information Contact Centre: 1-877-424-1300
E-mail: ag.info.omafra@ontario.ca
Northern Ontario Regional Office: 1-800-461-6132

www.ontario.ca/omafra

Ontario's airblast sprayer operators regularly apply pesticides to ensure the health and marketability of their tree fruit, nursery, berry and vine crops. Their success relies on three things: an understanding of safe pesticide handling, criteria for what and when to spray, and having the requisite skill to apply pesticides effectively and efficiently. Until recently, operators had few if any resources to address the final point.

Airblast 101 is a four hour classroom-based course designed to provide participants with practical tools to allow them to apply pesticides, plant growth modifiers and foliar nutrients in an effective, economic and environmentally-responsible manner. Developed by the Ontario Ministry of Agriculture and Food and the Ministry of Rural Affairs (OMAF/MRA) and funded by Croplife Canada, this course was created to introduce a new operator to spraying, or to refresh a seasoned veteran.

Since its introduction in 2011, hundreds of operators have received a solid grounding in the basics of airblast sprayer operation, as well advanced techniques. Those that have made changes to their spray programs report significant improvement in the effectiveness of the application (i.e. improved crop quality and/or yield) and greater application efficiency (e.g. pesticide inputs reduced by ~10% or more per annum and reduced environmental impact such as drift and runoff).

Thanks to the continuing financial support of Croplife Canada, Airblast 101 goes live at www.sprayers101.com and www.sprayers101.ca on January 1st, 2014. The website hosts all the content in the participant's handbook, but also includes a library of additional resources such as:

- factsheets,
- a series of sprayer-related PowerPoint presentations,
- instructional videos, and
- articles submitted by extension and university staff across North America.

The website will serve as a one-stop shop for airblast sprayer information and provide information about where Airblast 101 courses are being taught. The website is free to anyone interested in improving their spray programs.

For more information contact jason.deveau@ontario.ca