

GET PACKING!

Grading peaches by the pixel



New packing lines are revolutionizing how tree-ripened tender fruit can be speedily handled and shipped to consumers. The largest peach grower in Ontario, the Tregunno family, installed a Spectrim vision system three years ago at the farm near Niagara-on-the-Lake, Ontario. Ryan Tregunno stays sharp for 10 weeks as traffic controller in his computer pit above the lines of peaches and nectarines. With a brush bed bypass, Tregunno can even handle organic peaches and flat, doughnut-shaped peaches. Photos by Glenn Lowson.

KAREN DAVIDSON

If there's a thumbprint on a peach, Ryan Tregunno knows about it. Given that 16 tons of fruit pass by him every hour, that's quite a claim.

The Spectrim vision system installed at the family farm takes hundreds of images of the fruit as they are cradled like eggs on the packing line. From a control tower in the middle of a packing shed, Tregunno can spot the errant dent in a peach on a computer screen long before the bruise blooms in a consumer aisle.

"It's an unbelievable system," says Tregunno, referring to the Spectrim line installed three seasons ago at the family

farm on the fringes of Niagara-on-the-Lake, Ontario. "From orchard to the consumer package, human hands touch peaches only twice. Any defect can be pulled from the line."

For 10 weeks every summer, the Tregunno family harvests 800 acres of tender fruit in that prized triangle of real estate overlooking the Niagara River. Those acreages include peaches, nectarines, apricots, organic table grapes and wine grapes. Phil, the patriarch, and his sons Ryan and Jourdan have defined roles.

Phil is overall farm manager and chair of the Ontario Tender Fruit Growers. Ryan has specialized in the post-harvest side of the business while his brother Jourdan is orchard manager.



"No growing season is the same," says Ryan Tregunno. "We are constantly adjusting in the field while taking advantage of technical advancements in the packing house."

As the largest peach grower in Ontario, the Tregunno family has travelled extensively to keep abreast of industry trends. Several years before outgrowing the previous line, they inspected packing sheds in South Carolina, California and Europe. What became clear is that with every bend and turn or drop in the packing line, there was potential for bruising. That's why they decided to build a 225-foot long building that could handle fruit in a straight line.

Within that new building, they installed New Zealand's Compac sorting technology, including its Spectrim grading platform.

Continued on page 3

Ontario Food Terminal stays put PG 5

Nuts about DNA bar coding PG 9

Focus: Storage & containers PG 13

AT PRESS TIME...

New agri-food immigration pilot

Canada is launching a new three-year economic immigration pilot to help address worker shortages in the meat processing, mushroom and greenhouse sectors. Details on how to apply will be available in early 2020 says Ahmed Hussen, minister of immigration, refugees and citizenship.

As Hon. Hussen explained, the pilot is intended to attract experienced, non-seasonal workers who can economically establish in Canada and who can support ongoing labour needs of the agri-food sector. Specifically, the pilot will focus on attracting retail butchers, industrial butchers, food processing labourers, harvesting labourers, general farm workers and farm supervisors. Workers in year-round greenhouse crop production will be eligible for the program.

Candidates must have

- 12 months of full-time, non-seasonal Canadian work experience in the Temporary Foreign Worker Program in an eligible occupation (includes greenhouse crops)
- A Canadian Language Benchmark level 4 in English or French
- An education at high school level or greater (Canadian equivalency)
- An indeterminate job offer for full-time, non-seasonal work in Canada, outside of Quebec, at or above the prevailing wage



Stefan Larrass (L), senior policy advisor, Labour Issues Coordinating Committee/policy advisor, Ontario Fruit and Vegetable Growers' Association greets the Hon. Ahmed Hussen, federal minister of immigration, refugees and citizenship after the July 12 news conference in Mississauga.

"This pilot is another example of how immigration is helping to grow local economies and creating jobs for Canadians."

~ THE HONOURABLE AHMED HUSSEN, MINISTER OF IMMIGRATION, REFUGEES AND CITIZENSHIP

A maximum of 2,750 principal applicants, plus family members, will be accepted for processing in any given year. This represents a total of approximately 16,500 possible new permanent residents over the three-year duration of the pilot.

Employers in the agri-food sector who intend to be part of the pilot will be eligible for a two-year Labour Market Impact Assessment.

Details on how individuals may apply for permanent residence through this pilot will

be available in early 2020. Minister Hussen told The Grower that a number of federal ministries are involved and will need the six-month lead time to transition.

"This pilot program gives hope to workers in the greenhouse sector that there may be a pathway forward to permanent residency in Canada," stated Stefan Larrass, senior policy advisor, Labour Issues Coordinating Committee/policy advisor, Ontario Fruit and Vegetable Growers' Association.

NEWSMAKERS

Congratulations to Ontario potato breeder and grower, **Dr. Peter Vander Zaag**, who has been honoured with the Potato Association of America Honorary Life Membership on July 31 at its annual meeting in Winnipeg, Manitoba. Vander Zaag is known globally as an outstanding potato scientist, educator, mentor, innovative potato producer and breeder. He has also contributed to making the humble potato a staple in developing countries where rice has been the number one staple food.



Rarely, a well-known global potato scientist is also an outstanding potato farmer. VanderZaag is well respected by growers and researchers across Canada. He is constantly evaluating new potato production practices, and best of all, he shares what he learns with others.

Best wishes to **Clement Lalancette**, the general manager of the Quebec Potato Producers' Association, who is entering retirement. He has been a tireless supporter and defender of the Quebec potato industry.

Greenhouse grower **Stéphane Roy** and his 14-year-old son are reported missing in northern Quebec after his helicopter failed to return from a fishing trip on July 11. He is the founder and president of Sagami Inc., which sells greenhouse tomatoes and strawberries under the Sagami and Savoura brands. One of Quebec's major newspapers, La Presse, reported that the search by Canadian Armed Forces ended on July 20 after an extensive search over difficult terrain.

Cathy Lennon, an agricultural leader and advocate for more than 20 years, becomes the new general manager of the Ontario Federation of Agriculture, the province's largest agricultural organization on August 30, 2019. She takes over the reins, following the retirement of **Neil Currie**. Most recently, she was general manager of the Ontario Processing Vegetable Growers.



FMC Corporation announced June 17 that it is realigning the leadership structure for its North America and Latin America regions. **Ronaldo Pereira**, president, FMC Latin America, has been appointed president of the company's new Americas Region, which encompasses the U.S., Canada, Central America and South America.

Anita Stewart, member of the Order of Canada, cookbook author and food laureate for the University of Guelph, continues to champion Food Day Canada. This year it's August 3. Here's her invitation that celebrates the farmers who feed our country and the world.



The Grape Growers of Ontario welcome Canadian comedian, **Brent Butt**, as its celebrity luncheon guest on September 18. He is the creator and star of Corner Gas. The annual event kicks off the Niagara Grape and Wine Festival.

The Dispute Resolution Corporation elected new directors at its spring annual general meeting in Quebec City. They are: **Frank Pagliaro** (Canada), **Mike Stuart** (USA), **Bret Erikson** (USA) and **Gonzalo Aguilar** (Mexico).

Correction: We apologize for misspelling a name in last month's Newsmakers section. **Shreenivas Shellikeri** represents Highline Mushrooms on the board of directors for Ontario Produce Marketing Association.













BONNAZZA
Genova type that shows a good tolerance to Fusarium and Botrytis. Excellent shelf life after harvest. Recommended for container production. Annual.



SOLARIS
A good alternative to Escala. Roots are rounder and more uniform. Healthy foliage. For bunching.

Customer Service
order@norseco.com
514 332-2275 | 800 561-9693
450 682-4959 | 800 567-4594

Our Team of Experts
Warren Peacock
Ontario
warren.peacock@norseco.com
519 426-1131 | 519 426-6156
Gilliane Bisson
South Shore of Montreal and Manitoba
gilliane.bisson@norseco.com
450 781-6049

Proud of our roots since 1928

norseco.com

COVER STORY

Grading peaches by the pixel



A perfect peach starts in the orchard where it's carefully picked into a food-grade, reusable vented tote. Here, Phil Tregunno watches as totes are stacked onto a pallet on a wagon.



Peach packers can look at a computer screen for the instructions on how to fulfill an order, including packaging and configuration. They also print out the labels for food safety traceability.



L-R: Jourdan, Ryan and Phil Tregunno stand proudly on their Spectrim vision system which can take up to 500 pictures of each piece of fruit.



Peaches are snuggled into a corrugated box for final shipping.

Continued from page 1

Known globally for its prowess in fruit packing, Compac's claim is for uniform lighting that minimizes shadows and reflections. It's this combination of infrared (IR) and colour vision that enables growers to see the fruit and to identify specific pieces of fruit which should be discarded.

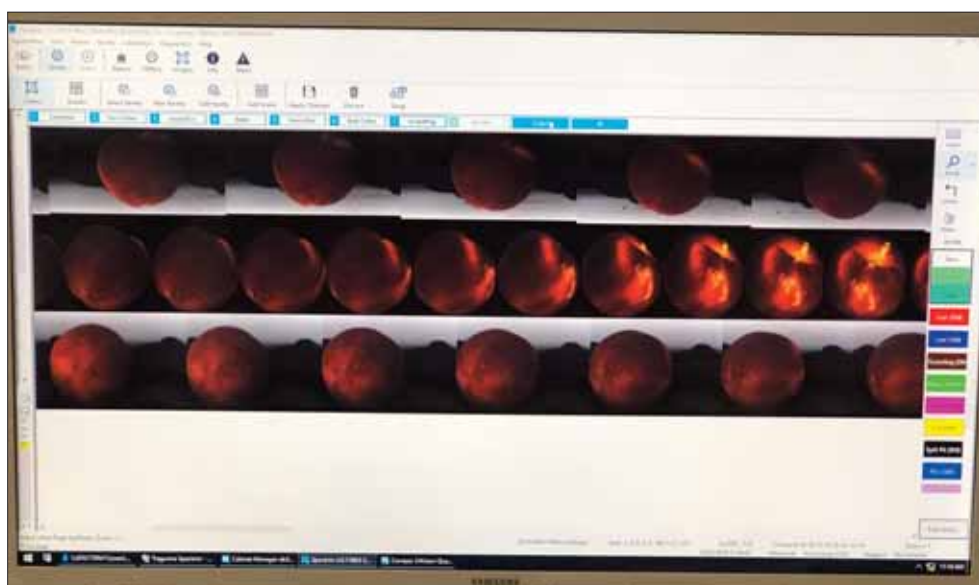
"Spectrim has machine-learning algorithms that can recognize softness or bruising on the surface of fruit," explains Tregunno. "Too much pressure on the shoulders of fruit will leave a thumbprint. The fruit may look fine to the naked eye but we need to pull that fruit before it gets into a package, reducing waste down the road."

As members of the Vineland Growers' Cooperative, the Tregunno's can now be more responsive to filling orders. Under the old system, they could handle five different packages per day. Now, with sizer software, they can handle up to 11 different configurations of packaging. The system has been designed ergonomically so that there is no lifting of a container which can be upwards of 25 pounds.

"There's lots of stress with a perishable product like peaches," says

Tregunno. "What we pick today can be cooled overnight and packed tomorrow. This new grading system helps with throughput at higher success rates. Any retailer representative who has seen our system is very impressed. We have the confidence of the retailers that we are providing consistency and that we have the highest quality peaches."

The Grower goes "Behind the Scenes" of this cover story to visit with Ryan Tregunno, Tregunno Farms, Niagara-on-the-Lake, Ontario. He traces the path of a peach from their orchards through the high-technology sorting and grading system. To listen, visit www.thegrower.org/podcasts.



Ryan Tregunno can spot defects on these infrared photos of peaches on the line.



CROSS COUNTRY DIGEST

BRITISH COLUMBIA

Berry growers receive research funding

The Mutz family at Berry Haven Farm hosted federal agriculture minister Marie-Claude Bibeau and local MP Jatai Sidhu on July 4. Funding of \$3.6 million will be made to the Lower Mainland Horticultural Improvement Association (LMHIA).

This project builds on research conducted through funding received under previous agricultural policy frameworks. It will have an expanded scope of activities with enhanced cross-commodity cooperation between berry producers across a variety of disciplines, including breeding, pathology, horticultural management and entomology.

“Access to the best cultivars of blueberry, raspberry and strawberry is essential for our

local berry growers because they are striving to deliver the highest quality fruit to customers in both domestic and international markets,” said David Mutz, treasurer, LHMIA. “This is why LMHIA is so excited to partner with the federal government to continue our long-term effort in breeding of new berry cultivars, developing better horticultural methods and improving control of economically important pests and diseases. This work is truly central to sustaining our competitiveness with other regions and ensuring a future for Canadian berry growers.” The federal government’s investment in plant breeding and applied research addresses several critical needs for Canadian blueberry, raspberry and strawberry farmers said Dr.

Eric Gerbrandt, research director, BC Blueberry Council, Raspberry Industry Development Council and BC Strawberry Growers’ Association.

“These farmers rely on development of superior varieties with greater fruit yields and quality as well as technical innovations that address pest, disease and horticultural management challenges. Moreover, this partnership with government is essential to the long-term viability of berry production in Canada because it supports competitiveness in the global marketplace for berries.”

Source: Agriculture and Agri-Food Canada July 4, 2019 news release



L-R: MP Jatai Sidhu, Hon Marie-Claude Bibeau and berry grower David Mutz

ALBERTA

Medicine Hat greenhouse to expand

Big Marble Farms Inc. is adding 10 acres of vegetable greenhouse and a state-of-the-art 6MW cogeneration power plant at its Medicine Hat, Alberta location. When the greenhouse is finished in August 2020, acreage will total 45.

Martin Energy Group is the vendor providing the cogeneration units. Waste heat will be recovered from those generators to assist in heating the greenhouses. The units are often referred to as CHP, or combined heat and power, a

more efficient and sustainable method of power generation.

“We are passionate about growing, and this is an opportunity for our organization to take the next step in offering a consistent supply of healthy, local produce, year-round,” says Ryan Cramer, CEO and partner of Big Marble Farms. “The new addition will enhance our existing facility and the power plant will provide safe, sustainable power so that we can continue to do what we do best.”

Big Marble Farms is a

second-generation, family-run greenhouse and packhouse operation supplying long English cucumbers, mini cucumbers, tomatoes on the vine and beefsteak tomatoes to customers throughout Western Canada.

In the meantime, Big Marble Farms is working with the City of Medicine Hat utility on the possibility of interconnection for the generation project to further optimize the capture of waste heat.



L-R: Big Marble Farms partners Rick Wagenaar, Ryan Cramer (CEO), and Albert Cramer

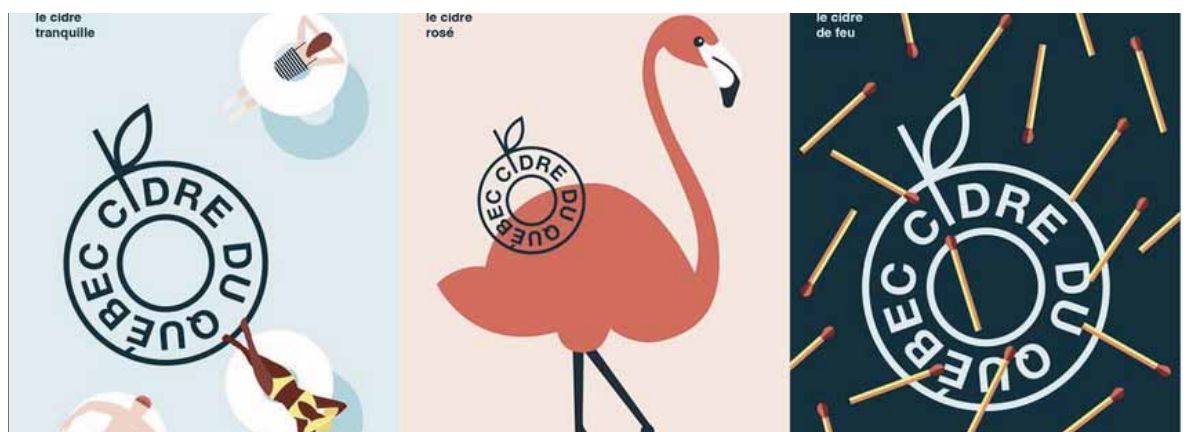
QUEBEC

Cider makers unveil new logo

The cider makers of Quebec have revealed a new visual strategy that communicates the singular character of different kinds of cider. Behind the strategy is a common theme that all of these products are

authentic, imaginative and refreshing.

Source: July 2019 newsletter, Les producteurs de pommes du Québec.



NOVA SCOTIA

Haskap berry growers launch Maritime co-operative

Twenty-eight growers have joined Hazzberry Farms to promote the tart-tasting berry known as haskap. The new co-operative of Maritime farmers is playing on the appeal of a local product as well as the health benefits of the haskap berry which is described as a cross between a blueberry and a raspberry.

Nova Scotia’s maritime climate is well suited to the haskap, says Joe Piotti, head of the cooperative. He credits the foundational work of LaHave Natural Farms for paving the way. Unfortunately, the farm suffered bankruptcy

despite producing an award-winning Haskapa juice at the World Juice Congress.

“We owe a lot of thanks to the research and the legwork of the people at LaHave,” Piotti says. “I think where perhaps a difference may be is that collectively as farmers we work toward the same common objective.”

One of Mahone Bay’s shops is launching the co-operative’s first round of products.

Source: CBC.CA June 15, 2019



FOOD NETWORK & DISTRIBUTION

Ontario Food Terminal to stay rooted in Etobicoke

KAREN DAVIDSON

Growers, wholesalers, retailers, chefs, green grocers, employees – literally thousands in Ontario’s food chain -- are relieved that the Ontario Food Terminal (OFT) will remain at its current 40-acre site in Toronto. Uncertainty had percolated around its future when the Ontario government announced a review last fall, raising speculation that the real estate valued at \$200 million could be sold and the terminal relocated.

In a hastily called news conference on July 8, Ontario’s agriculture minister Ernie Hardeman put all of those rumours to rest for the terminal that was established in 1954. Standing within metres of ongoing renovations, he confirmed the government’s commitment to the address -- 165 The Queensway, Etobicoke -- which is at the confluence of several major highways within a heartbeat of downtown Toronto.

“We’re quite excited and happy that the terminal is not going anywhere in the near future,” said Tom Komienski, one of the growers supplying produce to the farmers’ market from his base in Scotland, Ontario. “We have a secure spot to market Ontario produce.”

What is most encouraging to the farmer tenants is that the Toronto Wholesale Produce Association, along with government, has pledged a “significant investment” to modernize the terminal with an emphasis on the farmers’ market. Steve Bamford, spokesperson for the association’s 21 warehouse tenants, declined to name a number. The scale of that investment is yet to be determined pending the outcome of a strategic plan by the Ontario Food Terminal Board.

Attending the news conference was Christy McMullen, chair of the Canadian Federation of Independent Grocers.

“Improvements to the farmers’ market could include such things as improved temperature control and the addition of WIFI,” she told **The Grower**.

For growers such as Tom Komienski, this is welcome news. His family has a thousand acres in fruits and vegetables, with considerable investments



L-R: MPP Christine Hogarth; Ontario agriculture minister Ernie Hardeman; Steve Bamford, Toronto Wholesale Produce Association; Christy McMullen, chair, Canadian Federation of Independent Grocers. Photos by Glenn Lowson.



Tom Komienski, on the left, makes his point with Gary Da Silva, manager of operations for the Ontario Food Terminal.



Alida Solomon, chef for Tutti Matti Ristorante in Toronto’s entertainment district, gives her order to the representative of Boots Farms.

in packing and storage operations. He also markets produce from far afield, such as PEI potato growers, Quebec growers of leafy greens and British Columbia cherry growers.

“I’d like to see a proper facility with temperature controls so that we can properly display produce without breaking the cold chain,” says Komienski. “This has been an open-air market but the time has come for temperature control – 50°F – to make this a

world-class operation. These are the temperatures required for greenhouse produce, cabbage, broccoli, you name it.”

Beyond food safety, part of the envisioned improvements would make conditions safer for workers who are maneuvering tight spaces with trucks.

These future renovations would come on top of current work explains Gary Da Silva, manager of operations for the Ontario Food Terminal. In the shadow of nearby condos, a building crane is extending the



An extension of the southeast loading dock will be finished this month to provide 35 tractor trailer parking spaces for buyers. The 40-foot dock will allow buyers to assemble loads efficiently and safely.



A Tibetan worker shoulders a load of purple onions for buyers who are aggregating orders for outbound shipment.

southeast loading dock for 35 tractor trailer parking spaces for buyers. The existing cold storage shipping/receiving area is being expanded by 40 feet to allow for an inspection/quality control room. Once completed, loading docks for cold storage will increase from six to 17.

“We are building a state-of-the-art waste handling area which will be enclosed within a building,” says Da Silva. “We will have more dock space to properly sort and recycle more of our waste. Additional

compactors are part of that plan.”

Visitors to the site will enjoy a new pedestrian entrance into the terminal at the front gate. These new projects are scheduled for completion by end of year.

Overall, the OFT will be a more welcoming environment in a facility that never sleeps. All told, \$47 million has been invested in upgrades in the last decade by tenant and market users, none of it from government sources.

SAFETY NETS

Common interest in safety nets for edible horticulture

STEFAN LARRASS

If you see a bin or any other container with Ontario produce, there is a very high chance the farm where the crop was grown used some form of government safety nets program. Take 100 Ontario apples or any other crop, and on average you'll find that more than 95 of them will be from a farm enrolled in the provincial Self-Directed Risk Management (SDRM) program. And roughly 75 will be from a farm enrolled in both the two national business risk management programs: AgriInvest and AgriStability.

Crop-specific differences in available programs

Growers' uptake of other programs depends on their availability by crop. Greenhouse-grown crops, for example, don't have any crop insurance plans, despite considerable production risks such as pests. But even among crops where insurance plans are available, enrolment varies significantly. For example, roughly one in 10 strawberry acres in Ontario were enrolled in 2018, while the average enrolment for peaches, sour cherries and grapes all exceeded 70 per cent. Some crops such as green peas had near-complete (above 90 per cent) enrolment.

Differences in program uptake by crops are also noticeable for loan programs such as the national Advanced Payments Program (APP) and Ontario's Commodity Loan Guarantee Program (CLGP) both of which provide cash advances to help manage cash flow until crops are sold. Each program has a different list of eligible crops and crop uptake. Some crops are eligible for both programs (e.g. apples, potatoes) while others are only eligible for one (e.g. pears for APP only).

Making sure farmers have the tools they need

The edible horticulture sector is currently engaged in policy discussions about national and provincial safety nets. Federal-provincial-territorial (FPT) ministers of agriculture met in mid-July to discuss the future of the national programs. The Ontario Fruit and Vegetable Growers' Association (OFVGA) works with provincial partners such as Ontario Federation of Agriculture and national partners such as the Canadian Horticultural Council and the Canadian Federation of Agriculture to make sure common needs across commodities are loudly heard by these ministers as they consult with industry. This includes submitting



recommendations to Ontario agriculture minister Hardeman ahead of his July meeting with FPT ministers, advocating for a raise in the AgriStability coverage level back to the 85 per cent level, for the elimination of AgriStability's reference margin limit, and for improved loan terms for the APP in order to help growers cash flow their increasing expenses. At the provincial level, the commodity associations which are covered by Ontario's Risk Management Program / Self-Directed Risk Management Program (RMP/SDRM), have been challenged by the government to review the program and develop recommendations to modernize the program in a way to make it more insurance-like and more responsive to individual

growers' needs. The review is to be completed and applicable changes made before the increase to the program's budget outlined in the government's platform.

The difference in programs currently available to edible horticulture crops (and in their uptake by growers of a given crop) presents a challenge when it comes to developing safety nets recommendations that work universally for growers across the highly diverse edible horticulture sector. However, there is universal agreement that safety nets need to be strong and effective, but it is sometimes less clear what design changes work best for the wide range of horticulture crops as we continue to work within limited government budgets at both the federal and

provincial level.

OFVGA is approaching this challenge by bringing the different crop perspectives together to its safety nets committee table. The committee will review data and analysis to seek out any promising initial design options to inform OFVGA's discussions with OMAFRA in the coming months.

The committee's work will also be used to represent Ontario's edible horticulture sector perspectives at the national level where most of the decisions on the future of AgriStability and AgriInvest will be made.

Stefan Larrass is policy advisor, labour and safety nets, Ontario Fruit and Vegetable Growers' Association.

EVENTS

Fruit and vegetable farmer to host Breakfast on the Farm

Breakfast on the Farm, Farm & Food Care Ontario's (FFCO) most popular event series, provides a unique opportunity for non-farming Ontarians to visit a real, working farm and have their questions answered by real farmers. More than 26,000 people have been fed, entertained and engaged at these events since its inception in 2013.

On September 14, 2019, Breakfast on the Farm will be hosted at Barrie Hill Farms, in Springwater. It will be the first to be hosted at a fruit and vegetable farm since 2014. The day is free to attendees although preregistration is required. FFCO is expecting more than 2,000 guests, including local media and elected officials.

Barrie Hill Farms is a market garden farm owned by second-generation farmer Morris Gervais and his family. His parents, Adrien and Evelyn Gervais, originally started

growing tobacco in 1968, until they transitioned into strawberries in 1977 and continued to diversify into the 1980s with blueberries, raspberries, and asparagus. Morris has continued this tradition of diversification and in 2015 an apple orchard was established. Today, Barrie Hill Farms has more than 200 acres of fruits and vegetables. They also operate an on-farm market and offer "Pick Your Own" service of a dozen kinds of produce.

After being treated to an all-Ontario breakfast, guests will be able to visit interactive displays and exhibits that showcase other types of farms in Ontario. In addition, visitors will take a wagon ride through the berry crop and apple orchard, where they'll have the opportunity to pick fruit and learn about topics ranging from pest management, to seasonal agricultural workers,



The Gervais family

to equipment and technology such as wind machines and a cider press.

The event will run from 9:00 am until 1:00 pm, with breakfast served until 11:30 a.m.

Breakfast on the Farm would not be possible without the support of many national, provincial and regional farm organizations and agri-businesses, as well as community volunteers.

Partnership opportunities are still available for the September 14th event. This is a great opportunity to get involved in a cross-commodity and community-wide initiative with one common goal: increasing the public's confidence in Ontario food and farming.

There were 130 volunteers, including many local farmers, at June's event in Tecumseh.

Once again, FFCO is looking for friendly and outgoing volunteers to aid in a variety of tasks and share their passion for Ontario agriculture. In particular, volunteers with a background in horticulture are needed to help answer visitors' questions in the fields and orchards.

Visit www.FarmFoodCareON.org to learn more.

OFVGA ISSUES AND ACTIVITIES

Federal and provincial agriculture ministers talk priorities in Quebec City



GORDON STOCK
SENIOR POLICY ADVISOR &
GOVERNMENT RELATIONS,
OFVGA

This column is to keep you informed about the key issues that OFVGA is tackling on behalf of Ontario's fruit and vegetable farmers.

Federal-provincial-territorial meetings

Representatives from the federal, provincial and territorial (FPT) governments met in Quebec City in July. In addition to having representatives in Quebec City, OFVGA also participated in a roundtable with Minister Hardeman and submitted our main federal priorities to help the Minister

prepare Ontario's priorities. OFVGA's priorities included financial protection, labour, crop protection, business risk management, trade and plastics. On July 10, the federal and provincial governments announced their plan to hold the 2020 meetings in Guelph.

Ontario Food Terminal

Early last month Minister Hardeman announced that the initial results of the review of the Ontario Food Terminal determined that its location should remain unchanged in Etobicoke. While this is a win for the industry, the government's review is not complete, with a continued commitment to 'modernize' the facility. Ensuring the government and the general public understands the overall importance and complexity of the infrastructure within the province's food network remains an important and long-term task.

2019 weather challenges

There is no doubt that 2019 has been one of the most challenging crop seasons in recent memory. The cool, wet weather during the spring caused delays in many crops,

with some, particularly cash crops, not being planted at all. In other situations, additional use of crop protection materials has been required to keep disease at bay. OFVGA is available to answer questions from growers about how current business risk management (BRM) programming can help with difficult financial circumstances. Please direct any BRM inquiries to Stefan Larrass, Policy Advisor, at slarass@ofvga.org or 519-763-6160 x126.

CAP delivery for organizations

The provincial government announced in June that it is taking over delivery of the Canadian Agricultural Partnership for organizations from the Agricultural Adaptation Council (AAC), citing cost savings of approximately \$600,000.

OFVGA attended a meeting of the AAC's membership at the end of June to discuss the issue. The organization is concerned about loss of industry-led, decision-making. Before the Ministry announced its decision, the OFVGA had sent a letter to Minister Ernie Hardeman requesting a meeting to discuss process improvement



L-R: Leo DeVries and Bill George, two of the hosts of the Canadian Horticultural Council summer tour in Ontario.

on the side of the Ministry.

Canadian Horticultural Council summer tour

The Canadian Horticultural Council (CHC) held its annual summer tour and board meeting in Ontario this year. The two-day event included visits to the Ontario Food Terminal, Ippolito Produce, Bill George Vineyards and DeVries Fruit Farm, followed by an evening reception with Ontario stakeholders and a day-long board meeting. CHC works on national-level issues of importance to growers and Ontario is a key

member of the organization, with apple grower Brian Gilroy serving as CHC president, greenhouse vegetable grower Jan VanderHout as first vice president, and current OFVGA Chair Bill George filling a director position.

For more information on any industry issues, please contact Gordon Stock, senior policy and government relations advisor, at gstock@ofvga.org or 519-763-6160, ext. 125. More detailed updates can also be found at www.ofvga.org/news

AT PRESS TIME

AgriRecovery funds announced for PEI



Greg Donald, left, and Jason Hayden with the P.E.I. Potato Board join Cardigan MP Lawrence MacAulay and P.E.I. Premier Dennis King at the July 19 announcement of a harvest relief fund. Photo courtesy CBC.

The Canadian government and the provincial government of Prince Edward Island are providing some additional help for farmers following the poor potato harvest of 2018. The announcement was made by MP Lawrence MacAulay on behalf of the federal agriculture minister at a farm in Pownal, P.E.I.

About 2,800 hectares of potatoes were left in the ground last fall when rain and cold weather made it impossible to harvest.

Up to \$15.6 million will be made available through the AgriRecovery Framework, a federal-provincial program set up to help farmers recover from natural disasters. The provincial portion of the agreement is \$6.2 million.

Financial assistance will be provided to producers for the extraordinary costs relating to harvest recovery, additional field work, and storage and recovery, including costs associated with cleaning and disinfecting storage facilities.


canadian greenhouse conference | **40 YEARS**

ENGAGE. ENVISION. EVOLVE.

OCTOBER 9&10 2019 • NIAGARA FALLS

Join us for the 40th year of Canada's foremost event and connection point for commercial greenhouse and nursery growers, suppliers, and research partners.



 @CdnGreenhseConf
CanadianGreenhouseConference.com

CHAIR'S PERSPECTIVE

Working with our provincial government



BILL GEORGE JR.
CHAIR, OFVGA

is very important. The minimum wage issue is a really good example of where preparation and having your facts ready paid off.

We met with former Minister of Labour Laurie Scott – now Minister of Infrastructure – fairly soon after the new government took office last year to discuss the impact the provincial minimum wage increase was having on our sector. The government's decision to hold the line on the increase to \$15 and move to regular cost of living-based increases starting next year was important to our growers, and we're appreciative of their decisive action on that file.

We congratulate Monte McNaughton on his appointment as Ontario's new Minister of Labour earlier this summer and we look forward to working with him on other labour-related files that impact horticulture.

Key among those is the need to keep provincial labour regulations business-friendly so that we're competitive with other jurisdictions, and to make

sure government is aware of agriculture's unique situation when it comes to labour needs.

Environment is also an area with direct impact on our sector. As growers, we take our responsibilities towards the environment very seriously, but must balance that with the need to stay competitive and profitable while remaining stewards of the land.

We thank former Environment Minister Rod Phillips for the leadership he showed during his time in that position. OFVGA had the opportunity to meet with him several times and hope he will continue to be an advocate for horticulture in his new role as Minister of Finance. We look forward to getting to know our new Minister of Environment, Conservation and Parks Jeff Yurek.

Toby Barrett was recently named parliamentary assistant for agriculture and food. He is a long-time supporter of horticulture and the larger agricultural sector – we have worked closely with him in the past on many issues important

to fruit and vegetable growers, and it's nice to see that he is returning to an official role in our industry.

And I would be remiss in not mentioning our Minister of Agriculture, Food and Rural Affairs, Ernie Hardeman. In my experience he's always been approachable and he has a solid understanding of the sector and the issues we face as farmers and growers. Unfortunately, his ministry is under much more financial restraint than in the past, which means there's a need to look for efficiencies in all programs administered by OMAFRA.

As an organization, we understand what that means and we support the need for fiscal responsibility. At the same time, this must be balanced with programming that delivers what growers need. Crop insurance and business risk management are two leading examples that come to mind, and we are working with Minister Hardeman and OMAFRA staff at developing solutions that can work for growers while also meeting the

government's objectives.

One of Minister Hardeman's roles is also to represent Ontario agriculture at the federal level, such as the federal-provincial-territorial ministers' of agriculture meetings. This summer, those meetings were hosted in mid-July in Quebec City.

OFVGA met with the Minister to update him on the top three issues we'd like him to bring forward to the federal table: financial protection for horticultural growers, crop protection, and business risk management.

Canadian horticulture has long been asking the federal government for financial protection legislation to ensure growers get paid for their produce in case of buyer bankruptcy or insolvency in the U.S. Science-based decision-making around crop protection materials are critical to keeping Canadian growers competitive with other jurisdictions, and we need business risk management tools that will provide the help we need when we need it.

It's now been a year since Ontario saw its new provincial government take power. And it's certainly been a year of change, both for the province and for the agricultural sector. I've been involved in farm politics for many years and I can safely say I've never experienced a government that moves so quickly on so many files.

For the Ontario Fruit and Vegetable Growers' Association (OFVGA), getting good information in front of the politicians we deal with directly

WEATHER VANE



News that the Ontario Food Terminal will stay anchored to its roots in Etobicoke was welcomed by the entire food distribution network in Ontario and beyond. The farmers' market is a key magnet where freshly picked root vegetables from the Den Boer Family Farm, Otterville Ontario entice buyers. Photo by Glenn Lawson.

STAFF
Publisher: Ontario Fruit and Vegetable Growers' Association
Editor: Karen Davidson, 416-557-6413, editor@thegrower.org
Advertising: Carlie Melara 519-763-8728, advertising@thegrower.org

The Grower reserves the right to refuse any advertising. Any errors that are the direct result of The Grower will be compensated at our discretion with a correction notice in the next issue. No compensation will be given after the first running of the ad. Client signature is required before insertion.

The Ontario Fruit and Vegetable Growers' Association is the sole owner of The Grower. All editorials and opinions expressed in The Grower are those of the newspaper's editorial staff and/or contributor, and do not necessarily reflect the view of the association.

All rights reserved. The contents of this publication may not be reproduced either whole or in part without the prior written consent of the publisher.

OFFICE
355 Elmira Road North, Unit 105
Guelph, Ontario N1K 1S5 CANADA
Tel. 519-763-8728 • Fax 519-763-6604

The Grower is printed 12 times a year and sent to all members of the Ontario Fruit and Vegetable Growers' Association who have paid \$30.00 (plus G.S.T.) per year for the paper through their commodity group or container fees. Others may subscribe as follows by writing to the office:

\$30.00 (+ HST) /year in Canada
\$40.00/year International

Subscribers must submit a claim for missing issues within four months. If the issue is claimed within four months, but not available, The Grower will extend the subscription by one month. No refunds on subscriptions.

P.M. 40012319

ONTARIO FRUIT AND VEGETABLE GROWERS' ASSOCIATION BOARD OF DIRECTORS 2019

MANAGEMENT COMMITTEE

Chair: Bil George Jr., Beamsville
Vice-chair: Charles Stevens, Newcastle
Fruit: Norm Charbonneau, Port Elgin
Vegetable: Kenny Forth, Lynden
Director: Mike Chromczak, Brownsville

BOARD OF DIRECTORS

Apples: Charles Stevens, Newcastle
Fresh Veg other: Kenny Forth, Lynden
Tender Fruit: Fred Meyers, Niagara-on-the-Lake
Asparagus: Mike Chromczak, Brownsville
Fresh Grape: Bill George Jr., Beamsville
Fresh Veg muck: Jason Verkaik, Bradford
Potato: Shawn Brenn, Waterdown
Small Fruit: Norm Charbonneau, Port Elgin
Ginseng: Glen Gilvesy, Tillsonburg
Greenhouse: Jan VanderHout, Waterdown
Greenhouse: George Gilvesy, Tillsonburg

OFVGA SECTION CHAIRS

Crop protection: Charles Stevens
Environment and Conservation: Mike Chromczak
Labour: Ken Forth
Safety nets: Mark Wales
Energy, Property, Infrastructure and Food Safety: Brian Gilroy

THE
GROWER

URBAN COWBOY

Nuts about DNA barcoding

OWEN ROBERTS
U OF GUELPH

When University of Guelph informatics researcher Megan Milton found a tiny, roasted, salted -- and very dead -- cocooned caterpillar in her bag of California pistachios, she was as intrigued as she was disgusted.

The insect, which had burrowed inside one of the nuts, was unfamiliar to her.

And to someone working in biology, that's intriguing.

But it was more than that for Milton. The discovery gave her a timely opportunity to field test a new species identification solution called LifeScanner, that she is helping to commercialize. It was developed by Prof. Sujeevan Ratnasingham at the university's Centre for Biodiversity Genomics and a company called Biolytica.

LifeScanner puts species identification in producers' hands. It's useful in orchards, fields, gardens and parks across Canada -- and as Milton found, even in desk drawers -- anywhere potentially harmful pests need to be quickly and accurately identified.

And at approximately \$15 per test, it's incredibly accessible.

These traits were among the features that made LifeScanner the winner of the inaugural innovation showcase and pitch competition run by the university's Gryphon's LAAIR (Leading to the Accelerated Adoption of Innovative Research) initiative.

Developer Ratnasingham says that besides being the only off-the-shelf solution that can identify more than 200,000 species, LifeScanner builds on the ongoing data collection from

international research efforts to expand the global DNA library.

"If a novel species to the database is encountered, it's not long before we're able to give it a name," he says.

LifeScanner comes in a kit about the size of a wallet, with four vials of buffering solution -- each with its own barcode -- tweezers and a pre-paid mailer. That's it.

Users are instructed to download an app from the LifeScanner website or register on the web portal. When you find a mystery creature like Milton did, you scan one of the vials with the app, take a photo of the subject in question, pick it up with the tweezers, drop it in the vial, seal it in the mailer and drop it off in a Canada Post mailbox.

Normally, within two days, it's delivered to the Centre for Biodiversity Genomics (CBG) on the second floor of the Biodiversity Institute of Ontario building on the University of Guelph's west side.

There, a technician gives the specimen a unique identification number connected to the sender, extracts DNA from the specimen in the vial. Only a tiny portion is needed. The specimen is then analyzed with a DNA sequencer which compares its DNA to millions of other specimens that have been catalogued at CBG and at other institutions around the world.

The numbers are eye-opening. Between 2010 and 2015, researchers involved in the International Barcode of Life (IBOL) consortium based at the University of Guelph developed DNA barcodes for 500,000 species. These barcodes are created by sequencing short fragments of DNA for standardized identification.

Last month, in Norway, Guelph researchers were part of an announcement for a new seven-year initiative called BIOSCAN. It involves more than 1,000 researchers from some 39 countries, aiming to raise the barcoded total to two million species. It's an awesome, massive-scale undertaking.

LifeScanner uses these barcodes to make matches.

When one is found, the specimen joins the rest of the catalogue, and the sender is informed. Appropriate action can then be taken.

For some fruit and vegetable producers, for example, who are vulnerable to the arrival of new pests -- let alone the reappearance of traditional ones -- a LifeScanner identification could trigger an alarm bell. If the mystery pest is a true threat, immediate control measures may be taken to save the field.

For Milton, the action was pretty simple -- take a break from pistachios for a while, even though the nut company quickly acknowledged her finding. It explained the pest was a common Navel Orangeworm, and sent her coupons for free packages as an apology. In fact, she had an apology even before the completion of the DNA sequencing, which takes two to eight days.

But the story didn't end there.

When Milton looked up Navel Orangeworm, she found its species name was *Amyelois transitella*. That, though, didn't jibe with her specimen's DNA barcode, which was a match to specimens labelled as *Pyralidae-BioLep47*. That's what's called an "interim species name," assigned in this case by researchers in Costa Rica. That means the species had been collected and barcoded before, but no one who was working with the barcoding data knew what species it was, or even if it was a known species.

And a few months later, by happenstance, she was contacted in her role as data manager at Barcode of Life Data Systems by a pest expert working in California on crop pests. He had also done independent DNA barcoding on an almond pest larvae, that he suspected was the Navel Orangeworm, but his DNA sequence also matched *Pyralidae-BioLep47*. Without DNA, it could easily have been misidentified by farmers and others for decades. Ultimately, all records of *Pyralidae-BioLep47* on BOLD Systems were updated to reflect its true species name, *Barberia addinitella*.



Megan Milton, University of Guelph informatics researcher



Photos by Owen Roberts

Recently, a colleague of Milton's eating the same brand of pistachios likewise found a dead, roasted larvae inside. She sent it in for sequencing via

LifeScanner as well, and similarly got a match to *Barberia addinitella*.

Like Milton, she too has yet to crack open another pistachio.

AT PRESS TIME

\$1.3 million for Ontario research

Through the Ontario Agri-Food Innovation Alliance, the province is funding research projects at the University of Guelph to help optimize production and minimize the damage and economic losses caused by crop diseases and pests on Ontario farms. Some of

the research funding is also for field crops such as wheat and sugar beets.

However, funding specific to horticulture includes:

- Surveillance for blight management decisions in field tomatoes
- Investigating production of a

year-round supply of high-quality potatoes for Ontario

- Improving grape rootstock to prevent winter losses in sensitive areas

"As Canada's food university, University of Guelph has consistently delivered world-class discoveries that promote

the productivity and health of farmers' crops," said Malcolm Campbell, vice-president (Research). "Our researchers are committed to delivering solutions and opportunities across the agricultural sector, fulfilling our promise to improve life."

Ontario's fruit and vegetable sector contributes approximately \$5.4 billion to the GDP and supports more than 110,000 direct jobs.

Source: OMAFRA July 15, 2019 news release

RETAIL NAVIGATOR

Think about benefits rather than attributes



PETER CHAPMAN

In the average produce department, more than 300 items may be on display ranging from apples to zucchini. For an interesting exercise, try going through the alphabet! Beets, celery, daikon, eggplant . . . you get the picture.

Yet consumers often arrive at the grocery store with a general list for fruit and vegetables. How do you tempt consumers to try something different such as kohlrabi or icicle radishes? When you understand why they buy, you can really make sure you deliver. It is not just quality; there are many factors that influence the purchase decision.

We have developed a process called CART to help sell more products. There are four essential ingredients in this recipe for success:

Consumers
Alignment with your customers
Retail plan to sell your products
Trust with consumers and customers

Why do consumers buy?

Ask yourself the fundamental question: why do they buy? It can really help your business. Understanding the motivation

for a consumer to pick up your produce over another is so important. When you can articulate that they buy for specific reasons, you can focus your business to deliver in these areas and perhaps stand out from your competition. Do the research and do not assume you know why people buy or perhaps why they do not buy. Watch consumers in the store and assess what they are doing as they stand in front of the category. Every product has many attributes to be considered – freshness, local origins, colour, texture, phytonutrients, etc.

Benefits vs. attributes

Consumers usually buy because the product benefits them in some way. It could be that your product is an integral ingredient in a special or favourite recipe. It could also be that your packaging is environmentally friendly and that is more important than other attributes.

When I ask suppliers -- “Why do consumers buy your products?” -- I get some standard answers. Most start with ‘they like it’ or they start to list attributes of the product. Most often, consumers do not buy for attributes; they buy for benefits. What does fresh produce do for them? A snack for kids might include healthy ingredients. That’s an attribute but parents buy the ingredient because their kids will eat it and it is good for them. That is the benefit that motivates them to buy.

There are better answers to the question than simply consumers like the product.

If you are going to build programs and campaigns to get

your product moving off the shelf, highlight the benefits to consumers. This strategy will reduce consumer dependency on price. Your customers turn to price because it is what they know. Give them options and help them see opportunities.

Consumers are changing very quickly. The reason they buy today might be different than it was five years ago. One example of this change is packaging. The benefit to consumers is that people want to feel they are doing the right thing for the environment. It is influencing buying decisions where it never did before.

I had a supplier tell me last week they received a consumer comment that “we love your product but we are not going to buy it anymore because your packaging is not as environmentally friendly as your competition.”

Develop a list of product benefits and determine how important they are to the consumers you have identified as the target market. No doubt price (they see value), quality (it performs when they get it home or tastes great in a recipe), convenience (it is easy to use or saves them time) need to be a part of your list.

Consider other benefits as well such as how it makes them feel about the environment or that local ingredients might taste better or that they are a good parent feeding their children healthy products that they like to eat. Try to prioritize the list and share it with everyone in your business. Once you know the most important benefits to getting the sale, you can make sure you deliver every time.

If you have any questions about understanding why



consumers buy your products please give me a call at (902) 489-2900 or send me an email at peter@skufood.com.

WHAT'S IN STORE?
New frozen desserts

You can always learn from items in other categories. Halo is a new frozen dessert getting considerable shelf space in stores. The company has designed packaging that really stands out with a gold lid that catches the light in the frozen food cases. When you take the top off the package it makes you smile.

The manufacturers designed the package size carefully. They determined their target market was likely to want to eat the whole tub and they see it as a manageable indulgence. Here’s

their pitch -- 80 calories and six grams of sugar in 125ml compared to Haagen Dazs Butter Pecan with 355 calories and 21 grams of sugar in the same size. You can see where their target market would buy into the benefits they are getting from Halo over their competition.

Peter Chapman is a retail consultant, professional speaker and the author of A la Cart-A suppliers' guide to retailer's priorities. Peter is based in Halifax N.S. where he is the principal at GPS Business Solutions and a partner in SKUfood.com, an on line resource for food producers. Peter works with producers and processors to help them navigate through the retail environment with the ultimate goal to get more of their items in the shopping cart.

MAKING MOVES

Canada announces ELD mandate details



JENNIFER MORRIS

The Canadian government has revealed its ELD (Electronic Logging Device) plan. After a substantial consultation period with industry stakeholders, ELD

vendors and provincial and territorial governments, Minister of Transport, Marc Garneau, officially announced the rule which will require all commercial vehicles and bus operators to use a third party certified ELDs by June 12, 2021.

As the Canadian government had previously suggested, the rules will mimic those that have existed in the U.S. since December 2017. Transport Canada advised that the similarities are to minimize issues when crossing the border which will “facilitate trade and minimize the impact on Canada’s cross-border operations.” As previously mentioned by Transport Canada, there will be no change

to Hours of Service rules, only that they will now be tracked electronically.

The main difference in the two sets of rules, is that Transport Canada is requiring that the ELDs be certified by third parties whereas in the U.S., ELDs can be self-certified. Another difference is that the Canadian rule will not have a grandfather option, meaning that fleets already using E-logs will have until June 12, 2021 to ensure their devices are compliant.

Transport Canada estimates that up to 10 per cent of drivers “operate in excess of the allowable limits.” The hope is that if there is a reduction in Hours of Service violations that the number of fatigue-related

collisions will decrease as well. Transition to ELDs will also drastically reduce administrative tasks, such as filing out paper logbooks. It will also reduce the amount of time officers will need to verify driver compliance.

There are also hopes from industry stakeholders that this electronic regulation will help level the playing field for drivers that are currently compliant. With some drivers running outside the rules they are able to offer lower rates as they are able to take on more work in less time. Compliant drivers hope this will help regulate rates to fair prices.

Shippers and any companies that book freight should be aware that there will be a time

of adjustment starting when certified ELDs are available through the due date in 2021. Be aware that rates will likely spike during this time and then, as more companies become compliant, rates should regulate to something fair and reasonable.

Jennifer Morris is president of Two Roads Logistics based in Toronto, Ontario. She is an international shipping and logistics consultant with 15 years of experience in produce transportation. Her passion for helping small and innovative businesses is a welcome addition to the Education Committee of the Canadian Produce Marketing Association. She holds a degree in psychology from the University of Windsor.

PRODUCTION

The effect of heat stress on potatoes

EUGENIA BANKS

Potato productivity is greatly reduced at high temperatures: above 30 °C during the day and above 25°C at night. High temperatures reduce yield, cause secondary tuberization and physiological defects of tubers. The effect will depend on the variety and the stage of

growth, but in general the earlier a heat wave occurs, the more negative its impact.

High temperatures during tuber initiation increase the respiration rate using up energy and reducing tuber set. A high respiration rate mid-season or later may cause secondary tuberization, the production of a second set of tubers that never

size up. High temperatures during bulking slow down tuber bulking resulting in yield losses.

Tuber deformations are primarily caused by high temperatures that stimulate cell division and reduce the availability of carbohydrates by increasing respiration. Water stress does not in itself cause deformations, but drought exacerbates the deformations caused by high temperatures. The higher the temperatures and the longer the heat wave, the greater the effect.

COMING EVENTS 2019

Aug 1	Nova Scotia Fruit Growers' Association Summer Tour
Aug 1	Ridgetown Vegetable Open House, Ridgetown, ON
Aug 3	Food Day Canada
Aug 8-9	Triggs Lecture Series featuring Dr. Vaughn Bell, Brock University, St. Catharines, ON
Aug 10-11	Carp Garlic Festival, Carp, ON
Aug 14	Peak of the Market Annual Family Fun Day, Winnipeg, MB
Aug 14-15	AgriExpo, E & P Sénéchal Center, Grand Falls, NB
Aug 16-17	Carrotfest, Downtown Bradford, ON
Aug 20-21	North American Strawberry Growers' Association Summer Tour, Drury Inn & Suites Pittsburgh Airport Settlers Ridge, Pittsburgh, PA www.nasga.org.
Aug 21	Ontario Potato Research Field Day, Elora Research Station, Elora, ON
Aug 22	Ontario Potato Association Field Day, HJV Equipment, Alliston, ON
Aug 22	U.S. Apple Association Crop Outlook and Marketing Conference, Chicago, IL
Aug 29	PEI Potato Variety Field Day, AAFC Harrington Research Research, PE
Aug 31	Verona Lions Garlic Festival, Verona, ON
Sept 7-8	Stratford Kiwanis Garlic Festival, Stratford, ON
Sept 10	Berry Growers of Ontario Twilight Tour, Thames River Melons, Innerkip, ON
Sept 10-12	Canada's Outdoor Farm Show, Woodstock, ON
Sept 14	Farm & Food Care Ontario Breakfast on the Farm, Barrie Hill Farms, Springwater, ON 9 am to 1 pm
Sept 15	Toronto Garlic Festival, Artscape Wychwood Barns, Toronto, ON
Sept 16-18	United Fresh Washington Conference, Grand Hyatt, Washington, DC
Sept 18	Grape Growers of Ontario Celebrity Luncheon, Club Roma, St. Catharines, ON
Sept 18	Ontario Produce Marketing Association Golf Tournament, Lionhead Golf & Country Club, Brampton, ON
Sept 17-21	International Plowing Match, Verner (Municipality of West Nipissing), ON

Problems related to heat stress

1. **Heat Necrosis:** Heat necrosis is associated with hot, dry weather and high soil temperatures during tuber bulking. The vascular tissue turns brown. Chieftain is very susceptible to heat necrosis.

2. **Internal Brown Spot (IBS).** This discolouration can occur anywhere in the tuber flesh. It develops at the latter stages of tuber growth. IBS is often due to an enzymatic disorder caused by intense heat or excessive drought.

3. **Growth Cracks:** Growth cracks develop when relatively poor growing conditions switch rapidly to relatively good growing conditions. This could be hot, dry weather followed by excessive irrigation or heavy rainfall and a drop in temperatures.

4. **Elephant or Alligator Hide.** It appears as shallow, corky cracks on the tuber skin. High temperatures may contribute to the development of this defect.

5. **Second Growth e.g. heat sprouts, chaining.** Potato plants respond to temperatures of 30°C and above by increasing vegetative growth rather than setting tubers or bulking tubers. This can result in heat sprouts and chain tubers or heat runners in susceptible varieties.

6. **Tuber Defects:** knobs and malformations. Heat or water stress can constrict tuber growth in the bud, middle or stem end of the tuber. The location of the constriction depends on the stage of growth and extent of the stress. For example, a pointed bud end indicates that tuber growth was restricted during late tuber bulking. A pointed stem ends indicate early season stress.

Growth interruptions during mid-bulking can cause dumb-bell-shaped tubers. Knobby tubers are produced when the apical dominance of the bud end is reduced resulting in secondary growth at the lateral eyes of the tuber.



Blackheart



Second growth e.g. heat sprouts, chaining

8. **Glossy End Rot or Jelly End Rot:** Jelly end or sugar end is associated with high soil temperatures and water stress during early tuber development. It is most commonly seen at the stem end of the tuber.

9. **Pythium Leak.** This disease develops rapidly at high soil temperatures and can even develop before harvest. The incidence of leak is increased by harvesting tubers when the air temperature is above 27°C and humidity is high.

11. **Blackheart:** Any pre-harvest, storage or transit condition that prevents oxygen from reaching the center of the tuber will result in blackheart. Long exposure of tubers to field temperatures above 32°C before harvest usually result in

blackheart.

Physiologically old tubers:

Physiological age is increased drastically by heat stress. Physiologically old tubers tend to sprout early, produce more stems and cause the little potato formation defect.

Calcium fertilization with a water-soluble form of Calcium during bulking could mitigate an adverse impact of heat stress on tuber yield. The best way to apply Ca during the growing season is as Ca(NO₃)₂ as a side dress with irrigation.

From Dr. Jiwan Palta, Univ. of Wisconsin (2019 Ontario Potato Conference)

Eugenia Banks is a consultant to the Ontario Potato Board.

ONvegetables



Ontario Ministry of Agriculture, Food and Rural Affairs

The sweet, sweet taste of summer

ELAINE RODDY

Of all the produce of the season, watermelon might be the quintessential fruit of summer. A member of the cucurbit family, it is related to cucumbers, squash and pumpkins. In 2018, there were 1,500 acres of watermelon grown in Ontario.

Some varieties of watermelon are tetraploid, having four sets of chromosomes. When they are pollinated by a seeded diploid type, with two sets of chromosomes, the resulting fruit have three sets of chromosomes (triploid). These triploid fruit are sterile, and produce no viable seeds. Triploid (seedless) watermelons are the mainstay of the larger wholesale markets.

Because watermelon flowers are pollinated by bees, there must be an ample supply of diploid pollen in the seedless watermelon fields. In the past, growers would plant seeded (diploid) varieties interspersed within the crop to act as pollinisers. It was important to select varieties with different colouring, stripe patterns or different shapes, so they could be kept separate at harvest. As full-sized plants, these varieties take up considerable space in the field and are often harder to market.

Due to the high demand of seedless watermelon, and the lack of markets for the seeded pollinisers, many growers now use special polliniser plants. These varieties are smaller, and can be planted between the seedless varieties; taking up less space, with less competition for sunlight and nutrients. They produce small fruit, approximately the size of a softball, which do not require harvesting.

When it comes to harvest, some people still prefer the tap or thump method to determine ripeness. However there are a few other signs to look for. Tell tale signs include when the underside of the melon (where it touches the ground) turns from creamy white to yellow. Also, look at the stem end. When the tendril closest to the stem (peduncle) begins to dry up and turn brown, the fruit is fully ripe.

There are several diseases and disorders that impact watermelon production. One of the most problematic is likely

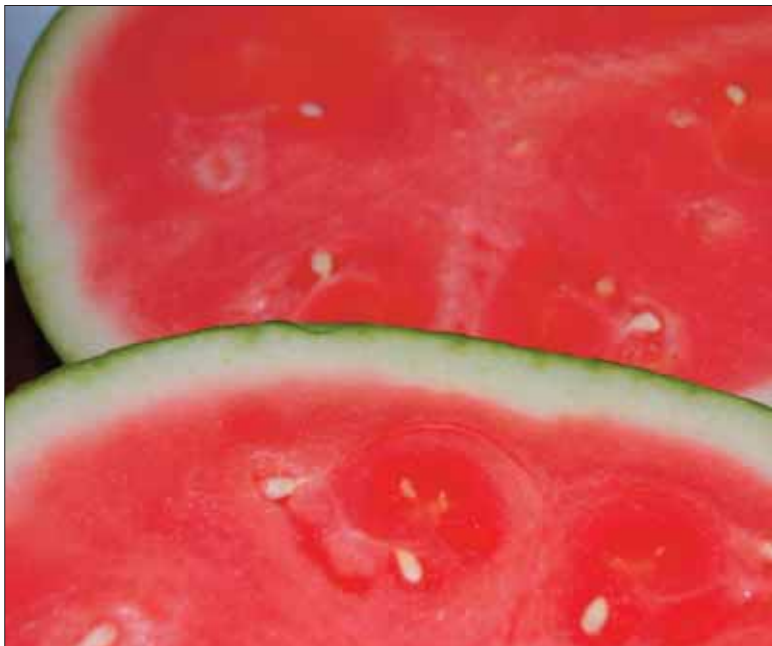


Figure 1. Underdeveloped seeds of the triploid (seedless) watermelon varieties



Figure 2. Male watermelon flower.

fusarium, a soil-borne disease. It can survive in soils for three to five years. As a result, crop rotation is extremely important. Fusarium is host specific. The fusarium infecting watermelons is a different form of the pathogen than the ones found in other crops such as wheat or corn, or even pumpkins. If the crop is established under cool, wet growing conditions, fusarium root rots may cause the young plants to die back in the first few weeks after transplanting. Sometimes fusarium infections begin to grow on the roots in the early season, but if the growing conditions are good, it may go undetected until the crop reaches peak fruit load. At this time the infected roots can not keep up with the demand for water and nutrients, causing the field to quickly decline before it

reaches maturity.

When it comes to marketing, consumers have a very low tolerance of hollow heart. This condition occurs when the flesh separates during the fruit formation, causing elongated growth cracks or a hollow cavity inside the fruit. Hollow heart can be difficult to predict and even harder to identify in the field. However, when loads are inspected, a fairly low incidence may cause the shipment to be rejected.

Hollow heart may be caused by a number of different factors including: insufficient pollination, fluctuations in soil moisture, or even cooler temperatures at the time of fruit set. Some varieties appear to be more prone to hollow heart than others. Recent research suggests that insufficient pollination is the most significant factor



Figure 3. A commercial seedless variety alongside a polliniser variety.



Figure 4. Yellowing and necrosis caused by fusarium.



Figure 5. Growth cracks forming on an unripe melon. The irregular shape is also (but not always) an indication of insufficient pollination.

causing this condition. Factors impacting pollination include: insufficient pollinisers in a seedless watermelon crop, polliniser varieties located too far from the seedless ones, and, poor weather conditions (cool,

hot, wet, windy) during pollination.

Elaine Roddy is a vegetable crops specialist for OMAFRA.

FOCUS: STORAGE & CONTAINERS

Fresh produce branding should be consumer-focussed



KAREN DAVIDSON

A trip to the Ontario Food Terminal is a stimulating experience, with hundreds of brands of produce vying for attention. In this business-to-business environment, there are global “sunflower” brands which stand heads above their competition.

One example is Fruitways pears from South Africa. Stacked in quantity, these corrugated boxes invite you to open the lid. Inside is a tray that encourages a sniff. Let’s hold one of these perfect pears – as if it was a singular light bulb.

That’s the “aha” moment that Lisa Cork talks about

as a global fresh produce strategist. Based in New Zealand and CEO of Fresh Produce Marketing Ltd., she’s a sought-after speaker and consultant with 30 years of experience.

Her observation is that many growers are so production-driven that they ignore the marketing side. Grower and packer brands are quite often farm names that communicate established reputations with wholesale buyers. However, in this age of splintering buying channels, that farm name doesn’t carry through to the consumer.

Cork advises that this is a missed opportunity for branding that speaks about attributes and benefits to the consumer. If you’re spending money on packaging,

then increase the return on investment with tweaks to the brand. In the example of the South African pears, that’s exactly what is communicated with a sticker that says “Crisp and sweet.” Note that the variety of pear – Forelle – is in smaller print.

Consumers often don’t buy by variety, but by product attribute. Cork offers another example for mandarin oranges. Add verbiage that says “seedless” or “easy to peel” or “few seeds” – that’s a concrete way to communicate a benefit to busy consumers. The goal is to encourage frequency of purchase.

“Today’s shoppers want story, brand and customized products that meet their needs,” says Cork. “Fail to deliver and you’ll get left behind.”

It’s more than just a box.

It’s Food Safe.

It’s Reliable.

It’s Recyclable.

It’s a Billboard.

For these reasons and more, the corrugated box is your safe bet.



Canadian Corrugated and Containerboard Association
 Association canadienne du cartonnage ondulé et du carton-caisse

Proud supporter of the
 Paper & Paperboard Packaging
 Environmental Council (PPEC)
www.ppec-paper.com



FOCUS: STORAGE & CONTAINERS

Building the sweet spot of apple storage is part science, part art

KAREN DAVIDSON

By the numbers, apple grower Chris Hedges spent five years of research on two continents to pull a trigger on a \$3.5 million investment in controlled atmosphere storage. Not only is he at peace with the decision, but so are his banker and accountant.

“It was painful at the time with a projected payback of 15 years,” says Hedges. “But I wanted on-farm storage so that I could deliver a better product and pull more margin out of an industry that is experiencing declining margins.”

By industry standards, Hedges is a young grower with 20 years under his belt. His 250 acres of high-density apples at Vanessa, Ontario are planted to consumer favourites: Gala, Honeycrisp and Ambrosia varieties. In 2011, he acquired another farm contiguous to his own. Only then, did he start musing about the possibilities of building his own controlled atmosphere (CA) storage with enough apple volumes to justify the space.

The science of CA storage – regulating oxygen, carbon dioxide and nitrogen levels as well as the temperature and humidity -- is well understood in preserving apples for months at a time. The art of CA storage is how the building is constructed to most efficiently control the interior environment. Air leakage is the enemy.

To that end, Hedges narrowed the contenders to a handful of vendors specializing in the field. Besseling Group, based in the Okanagan Valley of British Columbia, won the contract for the CA technology, the panels and the doors.

“They are a Canadian supplier with a long history in Holland,” explains Hedges. “They are not gimmicky, but put forward proven technologies.”

Continued on next page



Chris Hedges manages 250 acres of high-density apples at Vanessa, Ontario. He spent five years researching the best controlled atmosphere storage for his farm. Photos by Glenn Lowson.




OBSOLETE COLLECTION CAMPAIGN SEPTEMBER 20 – OCTOBER 1, 2019

Ontario! Got unwanted pesticides or livestock and equine medications?

Farmers: safely dispose of unwanted or obsolete agricultural pesticides and livestock and equine medications – **no charge!**

September 20 to October 1, 2019

For collection site locations and times, go to Cleanfarms.ca – “what to recycle where.”

PARTNERS



For more information: 1-877-622-4460

cleanfarms.ca

FOCUS: STORAGE & CONTAINERS

Building the sweet spot of apple storage is part science, part art



The Dutch expertise of Besseling CA Systems was contracted for the installation of controlled atmosphere rooms, panels and doors.



Buffer lungs regulate the atmosphere in the room partially before starting machinery.

Buchanan and Hall, Stratford, Ontario won the bid for refrigeration, with a reputation built in the agricultural sector since 1950. A local general contractor, Reid and Deleye, Tillsonburg, Ontario was hired to manage all the trades.

With these key suppliers in place, the starting time was February 2018 with clear deadlines. The structure was ready to receive that season's

harvest by September 2018.

"It's important to remember that you're a farmer," says Hedges. "I saved a ton of time and aggravation by hiring a general contractor who understood time lines in agriculture."

As it turned out, the 17,000-bin storage facilities of Hedges' buyer – Martin's Family Fruit Farms -- burned to the ground in a nearby village in March

2018. It was fortuitous to be able to rent some of the new 10,000-bin space last fall with room to stack nine bins high.

"We were jammed to the rafters," says Hedges. A true test of the quality of construction of a CA storage is the level of air tightness in the rooms. With the big crop last year, the Besseling equipment and panel installation were put to the test. Experienced CA storage panel installers were used. They also installed "fleece filler" on all the panel seams in the rooms. This additional measure ensures that the rooms can be kept at low oxygen and ultra-low oxygen regimes from the start.

Building costs are one consideration, but another is ongoing energy costs. According to the Besseling website, a frequency-controlled ventilator reduces energy consumption to a minimum – an important benefit because an adsorber runs for the majority of the day. Every fruit and vegetable variety has its own CO₂ production and maximum permitted CO₂ value. For this reason, Besseling produces different capacities of adsorbers.

The refrigeration is rack-style using variable horsepower units to minimize power use particularly after the building has been "pulled down" to maintenance temperatures. The entire building – from lighting to refrigeration to atmosphere control – has been designed and built to keep operating costs to a minimum for the long term.

"It's sticker shock to build these buildings," says Hedges, "but it's either pay now or later."

In the early going, Hedges has made an astute decision to invest in cold storage rather than more apple acreage. His rationale is to build his business vertically rather than horizontally. There are growers and then grower-shippers and marketers. He is relying on his expertise in the growing and management of his apples through the entire year.

When the Ontario government signaled the rapid rise of minimum wage rates in 2017, Hedges didn't risk planting more apple acreage, hiring more labour at ever-rising costs and building more bunkhouses. He figured there

was more certainty in building on-farm storage facilities that required only himself and one other person to manage.

In retrospect, after just one season of apple storage, Hedges has a new appreciation for the steep learning curve. With nearly all apple varieties, they don't get any better in storage. Knowing the qualities of the apples at harvest time and how fast they have been cooled to proper temperatures are important factors in evaluating apple quality coming out of storage.

"If apples go into storage a little soft and overripe, they will never improve in the cold," says

Hedges. "It's been a large learning curve by apple variety. Some varieties such as Honeycrisp aren't kept at typical refrigeration regimes, requiring extensive management such as individual controls room by room."

On July 22, Hedges shared his venture with those on the summer tour of the International Fruit Tree Association. His orchard and storage were a timely stop to punctuate his career in apples. The association has not visited Ontario since February 1999 – virtually when Hedges got into the business.

Setting the new standard in CA storage

Unrivalled quality, from fruit growers roots



- Superior quality equipment
- Unbeaten energy performance
- Extreme reliability
- Small footprint
- Global operating company
- Local support and service

NITROGEN GENERATOR

- High purity output
- Most efficient energy to production ratio
- Low total cost of ownership



CARBON DIOXIDE ADSORBER

- Large range of capacities available
- Low energy consumption
- Patented low oxygen operation

ETHYLENE CONVERTER

- Decomposes to PPM and PPB levels
- No consumables
- Proven technology



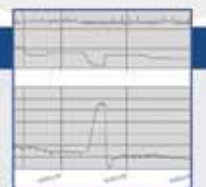
ATMOSPHERE CONTROL SYSTEM

- Control of O₂, CO₂, C₂H₄, temperature and humidity
- Centralized controls via easy to use software
- High accuracy sensors



DCA - FRUIT OBSERVER

- Based on chlorophyll fluorescence measurement
- Safe detection of lowest oxygen level
- Significant reduction of scald



BESSELING NORTH AMERICA
CONTROLLED ATMOSPHERE

110 Carr Crescent - Oliver BC - V0H 1T5
Canada
+1-250-462-3187
www.besseling-northamerica.com
migiel@besseling-northamerica.com



FOR YOUR PACKAGING SUPPLIES CALL US AT 1-519-863-5782.
AGRICULTURE / INDUSTRIAL PACKAGING

Shopping Bags, Biodegradable • Plastic pallet/wrap • Net wrap
Mesh Bags for Corn / Onions / Firewood
Cardboard boxes Waxed • Paper Bags for Potatoes
Wood Bushels and Baskets
Plastic Trays: Clamshells / Punnett Trays
Fibre Trays: 1pt / 1/2 pt

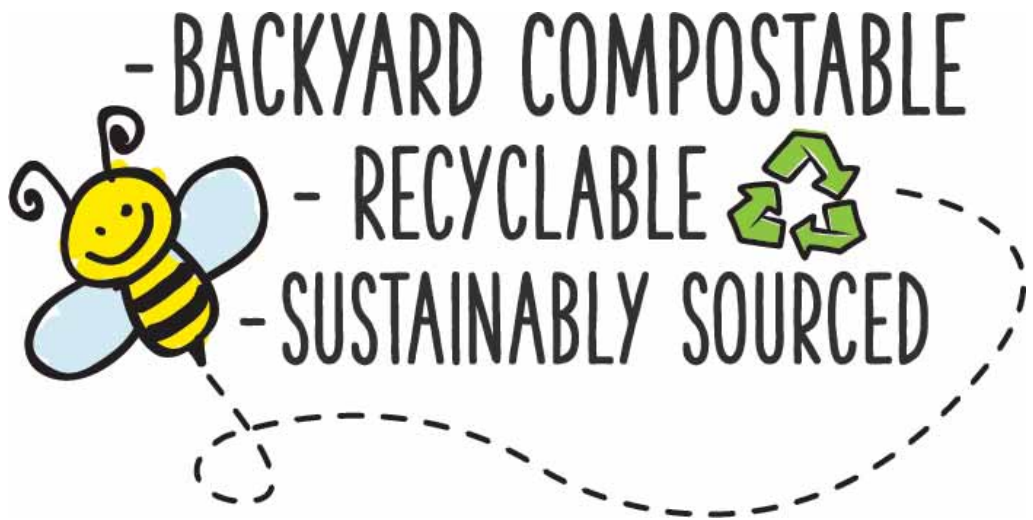


NNZ INC. EASTERN CANADA
3-136 Main Street, West Norwich, Ontario
Email: adejonge@nnz.ca

NNZ INC. WESTERN CANADA
Unit 107 - 2076 192 Street, Surrey, British Columbia
Email: Bcolquhoun@nnz.ca ph: 778.819.1139

FOCUS: STORAGE & CONTAINERS

No single solution to addressing single-use plastics



Towards a sustainable future

Developed with customers and the environment in mind, SUNSET offers a line of backyard compostable packaging. While most compostable packaging needs to be processed at a special facility, there are a limited number of those facilities in North America. To maximize impact, SUNSET has developed trays that break down naturally in backyard compost, empowering consumers to make a difference while at the same time increasing the odds of ideal end-of-life disposal. The compostable trays and film are also produced from renewable resources.

SUNSET recently became the first fresh produce company to join the Sustainable Packaging Coalition. Through this membership, the company has joined forces with other leading companies and thought leaders who believe in the power of industry to make packaging more sustainable.

The Canadian Produce Marketing Association (CPMA) has convened a Plastics Packaging Working Group which met in early July in Toronto. Representatives of 27 companies took part in a variety of educational workshops, research presentations and planning sessions, helping to form the vision and next steps

for the group.

Experts spoke about the general industry landscape related to plastic use, Canadian regulatory review, economic analysis, public opinion studies, the psychology of consumer decision making, and challenges and opportunities in both the current state of recycling and the current state of plastic

packaging. The group also heard an update on the Government of Canada's plastics initiative from Environment and Climate Change Canada.

The focus of the Canadian government to achieve a circular plastics economy which addresses prevention, recovery, clean-up and collection of plastics is extremely complex, not only within the fruit and vegetable sector but across Canada and internationally. Focusing discussion on the opportunities and challenges surrounding the government's goal to reduce single-use plastics identified unique challenges which the working group began considering during the workshop on July 9, 2019.

The presentations, along with the individual expertise and experience of the working group members, led to very robust discussions within break-out groups to begin framing a path forward on the topic of plastic packaging in produce. "All members of the CPMA Plastics Packaging Working Group displayed incredible professionalism while sharing their knowledge and insights at our first official working group meeting," said CPMA president Ron Lemaire. "This group brought to light the importance of plastics in our industry and the complexity of the issue. There will be no single solution to addressing single-use plastics and it will be vital that we work together to meet commitments being discussed regionally, nationally and internationally by governments."

penn
Refrigeration Ltd.
Since 1961

100% SATISFACTION GUARANTEED

Refrigeration (all types)
Heating
Air conditioning
Controlled atmosphere

18 Seapark Drive St. Catharines ON L2M 6S6
Tel: 905-685-4255 Fax: 905-685-0333
info@pennrefrigeration.com
www.pennrefrigeration.com

FREE COOLING EXPERTS

PLUG AND PLAY

KOOLJET
RELIABLE REFRIGERATION SYSTEMS

KOOLJET • (866) 748-7786 • www.kooliet.com

PLASTIC BASKETS

- MADE IN CANADA
- Strong durable plastic
- Sturdy handles
- Weather proof
- Reliable delivery

NEW COMPETITIVE PRICING

SHOULDice FARM INC.
www.shouldicefarm.com

www.shouldicefarm.com
613-838-4203 • shouldice1@bell.net

Naturally PROTECTIVE

Royal CONTAINERS

royalcontainers.com

FOCUS: STORAGE & CONTAINERS

Load damaged by transit temperatures

Q: We received a load of mixed vegetables from one shipper and only a portion of the load was showing freezing damage. The rest of the product pulped adequate temperatures and had no indication of freezing damage. How is it possible that the pulp temperatures can vary so much within the trailer?

A: To understand how this could have happened, we begin by reminding you that trailers are responsible for maintaining temperatures during transit. They are not meant to cool down or warm up the product. Three main reasons come to our mind that could cause freezing damage to only a portion of a load: a) Product loaded warmer than the reefer unit set temperature; b) bad loading pattern blocking the airflow or blocking the air chute; or, c) poor trailer insulation or extreme weather conditions.

a) Product loaded warmer than the set temperature

The BOL indicates temperatures are to be maintained at 33°F. The product at loading is pulping 38°F; the freezing point is 30.5°F. The reefer is set at 34°F degrees on continuous mode. When this occurs, the return air sensor is going to start picking up the temperature of the product (38°F) and the message to the reefer unit would be that it needs to lower the discharged temperature immediately to lower the temperature in

the trailer. Therefore, the product exposed directly to the discharge air from the chute may exhibit freeze damage because the discharged air temperature could be lower than the freezing point of the product.

b) Bad loading pattern blocking the airflow or blocking the air chute

A loading pattern that does not allow the air to circulate properly may result in the return air sensor reading temperatures above the reefer unit set point, therefore sending the message that cooler air needs to be discharged. Normally a blocked air chute will result in warmer pulp temperatures at the front of the truck and cooler pulped temperatures at the back of the truck. This is because as the front of the truck begins to warm up, the reefer unit believes it needs to expel colder air, and thus the product nearest to the end of the chute gets chilled.

c) Poor trailer insulation or extreme weather conditions

Product loaded too close to the walls on a trailer with poor insulation may create freezing damage to pallets nearest to the sides of the trailer. This could be the result of harsh temperatures during the winter or hot outside temperatures during the summer. Similar to the previous example, to compensate the reefer unit will usually discharge cooler temperatures or warmer temperatures

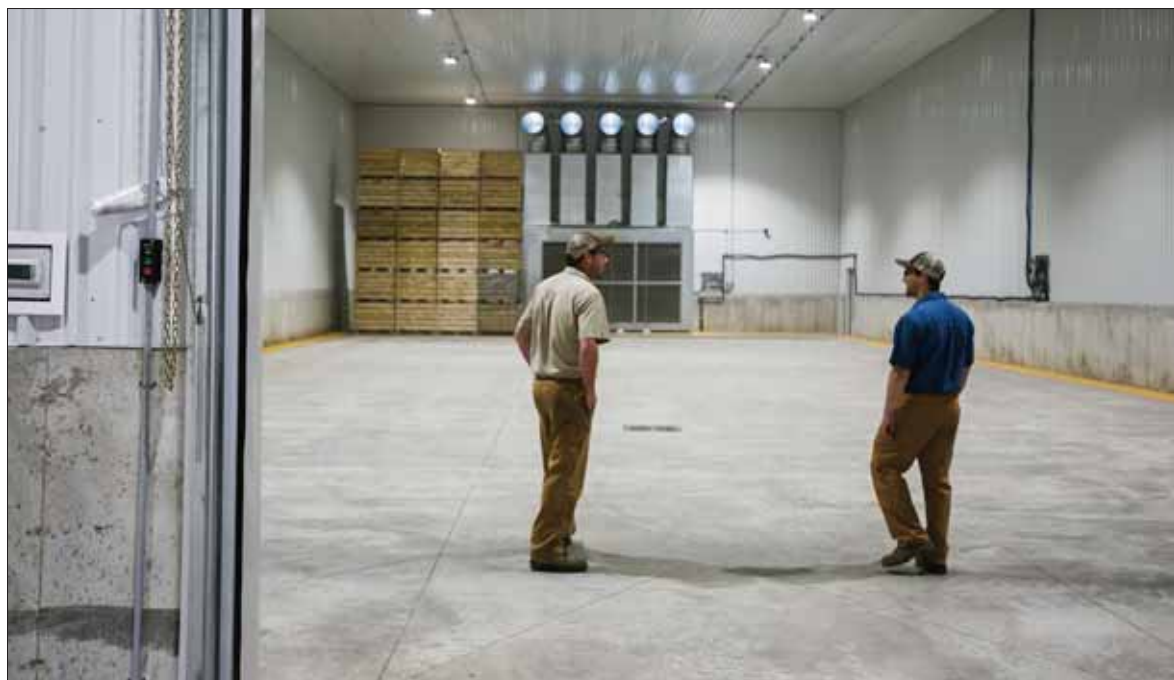


than the set point in order to correct the problem. For instance, if a truck travels through the northern U.S. or Canada during the winter and it is not properly insulated, there is a strong likelihood that the pallets closest to the exterior walls could experience some freezing damage. Conversely, despite proper trailer insulation, sometimes extreme

weather conditions such as severe cold or intense heat may influence the temperatures inside the trailer.

Source: Dispute Resolution Corporation July 17, 2019 newsletter

Coming up in September . . .



Gwillimdale Farms has built a large storage facility for root vegetables near Bradford, Ontario. Farm manager Murray Jelly (L) and Quinton Woods, sales and operations manager, inspect one of the rooms that will store potatoes this fall. Photo by Glenn Lowson.





P: 519-373-9679 F: 519-599-2609
Email: 27west@bmts.com

We manufacture standard fir plywood bins and half bins.
 Right now we have some inventory of both sizes.
 We also sell a complete line of parts.
 All bins are stenciled according to purchasers wishes.
 Please don't hesitate to call us!!!





KLIM'TOP[®]
CONTROLS



Manufacturer of Crop Storage Equipment
for Potatoes, Carrots, Onions, Cabbages and more



**Refrigeration, Re-heating, Ambient,
Humidification, Internet Remote Controls...**

Canada: John HAMBLY [905] 953-6624
Head Office : +33 28 588 981
Email: info@klimtop.eu
www.klimtop.eu

MARKETPLACE WORKS

advertising@thegrower.org
866-898-8488 x 221

EQUIPMENT

**TURBO-MIST
NEW & USED
400, 500, 600 GAL
TALL SPRAY TOWERS
TRADES ARE NEEDED**



BIN CARRIER FOR FRUIT AND VEGETABLES



HYDRAULIC TILT AND LOAD - 5 BINS - WOOD AND PLASTIC
USED: Arthur Bin Carrier \$3,300
Votex 3-PH. 8 1/2 FT Mower, like new \$5,800

DON ARTHUR ORCHARD EQUIPMENT
(519) 599-3058 donarthur3@gmail.com Thornbury, ON

PLUG TRAYS



Make the smart choice.
Reusable EPS trays

 **bpgrower.com**
BEAVER PLASTICS

1-888-453-5961 growerinfo@beaverplastics.com



greenhouse innovation

This year's Canadian Greenhouse Conference is slated for October 9 and 10. Get ahead of the curve by advertising your booth number. Let growers know about your state-of-the-art solutions – in genetics, growing media, lighting, water management and monitoring systems.

As a bonus, **The Grower** newspaper will be distributed in attendees' totes.

Booking deadline: August 16, 2019
[get pricing >>](#)

Book before August 1 and save 10% off the price of your ad. Discounts apply to ads booked at 2019 Media Planner rates.

866-898-8488 x221

IRRIGATION

CALL ABE FIRST FOR BETTER PRICES, MORE CHOICES, FAST, AND FRIENDLY SERVICE. BUY A DIESEL ENGINE PUMP UNIT FROM THE DIESEL MECHANIC.



NEW IRRIGATION PUMP UNITS ON TRAILER

- Cummins 4 cyl & 6 cyl
- John Deere, 4 cyl & 6 cyl
- Iveco 4 cyl & 6 cyl
- Kubota & Deutz etc.
- Perkins-Cat

Rovatti / Cornell / Berkeley Pumps, etc. And many more new or used up to 550 HP.

We build them all big or small. Also couplers, hoses, clamps, for suction, camlock, ringlock, bauer etc.

A. KOOLMEES

R.R. 1, Otterville, ON N0J 1R0
(519) 879-6878
Fax: (519) 879-6319

CLASSIFIEDS

For Sale: Used wooden apple bins. Algoma Orchards. 905-242-6141

Wanted: Plastic vegetable/apple bins. Approximately 4ft x 4ft. Contact Raymond at 519-235-0141 ext. 247.

October 2019



New Equipment & Technology

Horticulture is rapidly moving towards more labour-saving equipment, robotics and wireless technology. This issue will be an ideal editorial package to introduce what's new and to kickstart purchase plans for 2020.

Booking deadline:
September 16, 2019

SEED, ROOTSTOCK & ORCHARD SUPPLIES



HASKAP

EDIBLE BLUE HONEYSUCKLE

Visit our website for information about our varieties, pricing, research, and production guide.

Plants for sale at
www.phytocultures.com
admin@phytocultures.com | 902.629.1229



Farm | Orchard | Vineyard | Berry Trellising

PWP
PRINCETON WOOD PRESERVERS LTD.

Kiln Dried Pressure Treated Round Wood Posts and Rails.



www.pwppost.com

Preferred Supplier for BC Ministries & Parks Canada.
Guaranteed Life Expectancy of 25 years if not damaged or altered before or after installation.

Contact Greg Ardiel 705-443-7613



Providing quality apple trees for 40 years.

- Bench graft
- 9 month bench
- KNIP tree
- Top grafting existing orchard

Brian Van Brenk
31760 Erin Line
Fingal ON, Canada
N0L 1K0
519-902-6353
www.vanbrenk.ca
brian@vanbrenk.ca



QUALITY FRUIT TREES

- APPLE on M9, B9 and M26
- Peach on Bailey
- PEAR on Quince

* Custom Budding Available
ORDER NOW FOR BEST SELECTION

WARWICK

ORCHARDS & NURSERY LTD
7056 Egremont Rd. R.R. #8
Watford, Ontario
N0M 2S0

warwickorchards@brktel.on.ca
Tel: (519) 849-6730
Toll free: 877-550-7412
Fax: (519) 849-6731

CHANGE OF ADDRESS?

866-898-8488 x221
advertising@thegrower.org

CROP PROTECTION

Resistance management – more important than ever



CHRIS DUYVELSHOFF
CROP PROTECTION ADVISOR,
OFVGA

As with any crop, insects, diseases, and weeds found in horticulture production can and do develop resistance to their controls. This is evident by a reduction or complete failure of control using an effective crop protection product when appropriately applied under label conditions. The nature of specific resistances can be complex but most importantly resistant individuals pass on these characteristics to their progeny thus making resistant populations.

The resistance challenge is not new or unique to growers of horticulture crops. However, the diverse nature of the crops and target pests and the reduced availability of active ingredients makes resistance management particularly challenging for this sector. Few field crops have the duration and intensity of pest pressures faced by many horticulture crops. The marketability of horticulture crops is so impacted by quality that even lighter pressure that may not limit biological yield may be intolerable. Both of these factors mean more applications per season are usually required for horticulture crops, promoting selection pressure and leading to greater resistance potential.

Contributing to the resistance management issue in horticulture is often reduced availability of active ingredients. The size of the crop protection market for minor use crops in Canada limits direct registration activity. Though the Minor Use Program does contribute, it cannot fully compensate for all gaps. A further complication is

the cancellation of existing active ingredients as a result of the Pest Management Regulatory Agency re-evaluation program.

Cancellations can be quite justified as a result of human health or environmental concerns. Updated data that might mitigate risks however simply may not be developed in re-evaluations for minor use crops due to the small potential return.

In the big picture, the number of tools is simply getting more limited, especially factoring in current resistance across many pests. For fungal disease control, multi-site fungicides such as captan, chlorothalonil, and mancozeb have long been part of the control strategy. They are valued not only for their disease control spectrum but the very low risk of resistance developing. Numerous highly effective single-site fungicides were introduced along the way with resistance reported in many products over time. Resistance management efforts have suggested tank mixing single-site fungicides with a multi-site to delay the onset of resistance. While effective, changing regulatory requirements have now severely limited or eliminated this strategy.

The introduction of the neonicotinoids which brought systemic and long-lasting insect control along with low mammalian toxicity were great innovations in many production systems. Re-evaluation decisions have begun to restrict or eliminate uses of neonicotinoids due to environmental concerns. Their predecessors in organophosphates and pyrethroids – which have already had many instances of resistance – are also facing increasing regulatory pressure. Other insecticidal groups will be forced to take on more of the load in the near future, notably the diamides and spinosyns.

Resistance to herbicides in weeds has been the more prominent issue among field crops certainly. However, horticulture crops have had their share of difficulties such as linuron resistance in pigweed as



Colorado potato beetle

one example. The appearance and spread of weeds with resistance to multiple herbicide groups is also becoming of greater concern. Adding to the challenge, horticulture crops lack the herbicide resistance traits such as glyphosate, glufosinate, or dicamba found in some field crops, limiting their use. Perennial crops have the further problem of limited tillage and rotation options.

We know resistance management is a particular challenge in horticulture. What can we do about it? The classic recommendations of course still apply. Use scouting and diagnostic services to confirm pest presence and pressure where appropriate. Rotate groups of crop protection products. Rotate crops, if possible, to avoid repeated exposure of the same active ingredients over time. Use alternative controls such as tillage for weeds and netting for insects. These methods have been proven and remain important.

But they probably won't be enough. Resistance continues to develop, following the processes of evolution. Dynamic scouting methods that provide feedback on existing resistance will certainly help, such as the quick tests for herbicide-resistant weeds being developed in Ontario and Quebec. These tests would allow a grower to test small weeds for herbicide resistance in season with a quick turnaround. An alternative mode of action can then be used on the same

weeds to prevent further spread of resistance by pollen and seed.

For longer-term sustainability, it's clear that more tools are necessary. More biological crop protection products are being used than ever in multiple crops. Having followed several trials, I can say that efficacy in field production can be highly variable. I have seen complete failures and also excellent control. Efficacy is typically more consistent in rotation with conventional products. They offer a different mode of action and take some selection pressure off the remaining effective conventional groups. The U.S. IR-4 program – equivalent of Minor Use – has recently created a new category of research called integrated solutions to explore conventional and biological combinations. Managing resistance is a key focus of this program.

Cucumber beetle was one of the first integrated priorities selected in the program debut in 2018. With few solutions, especially without neonicotinoid seed treatments, this a perfect fit for exploring integrated control.

Integrated control measures are critical to maintaining effective crop protection with fewer tools and growing resistance. New effective methods must be welcomed. Our future strategies must have resistance management as a principal factor or we face a tough road ahead.

Other insecticidal groups will be forced to take on more of the load in the near future, notably the diamides and spinosyns.



EFFECTIVE
FLEXIBLE
CONVENIENT

www.belchimcanada.com



PHOSTROL

Phostrol is an extremely systemic and highly unique phosphite fungicide that has both a direct and indirect effect on harmful oomycete diseases on a broad range of crops. Phostrol provides effective, convenient & flexible preventative protection against a variety of diseases including downy mildew, late blight, root rots and septoria leaf spot.



BELCHIM
CROP PROTECTION CANADA

HONEYCRISP

Too Much Bitter Pit? Too Little Storage and Shelf Life? Talk to Us...



The Right Information. The Right Products. The Right Programs.

Reducing Bitter Pit in Honeycrisp while increasing storability and shelf life requires more than just the right product, it requires the right information. The right information builds a complete nutrient program that is required to successfully grow this challenging variety and realize its significant profit potential.

Agro-K Can Show You...

- Which forms of calcium reduce bitter pit rather than increase its potential
- How the right nutrients at the right time can reduce bitter pit and increase storability
- Which nutrient mixes improve size without increasing bitter pit
- The appropriate spray intervals for foliar calcium
- To achieve the right nutrient ratios for less bitter pit and better shelf life
- How to design programs to help manage crop load
- How to take into account various soil situations
- The intelligent way to design a soil nutrient program

Your local source in Ontario and Atlantic Canada for Agro-K products



AGRO-K CORPORATION
8030 Main Street, NE • Minneapolis, MN 55432
www.agro-k.com

Rick de Jong - 778-215-6723
*Science Driven Nutrition
Science Driven Solutions*

© 2019 Agro-K Corporation



Underhill's Farm Supply - 519-866-3632



The Agromart Group - 902-895-2857



Sprucedale Agromart - 519-934-2340