

KNOCK-ON COSTS OF PANDEMIC

Why joint pain still afflicts the supply chain



If Canada is to improve the cold chain for its horticultural exports, then improvements are required at ports. Perishable produce relies on a mix of regulatory factors, global logistics services, smart transportation and warehousing infrastructure. Given the speed of global change, that's a near-term challenge. Photo courtesy of Vancouver Fraser Port Authority.

KAREN DAVIDSON

COVID may be in the rear-view mirror, but there's no analgesic balm for all the hand-offs from one supplier to another. Anecdotal evidence abounds of ongoing parts, equipment and sales delivery problems across the entire fresh produce industry. Together, these factors contribute to stubbornly high retail food prices.

"We were hamstrung by a tiny device measuring four inches by four inches," recalls Steven Roberts, director of produce sales for Vineland Growers' Cooperative, Jordan Station, Ontario. "It's the part that controls refrigeration coolers. The overseas supplier had the part on back order due to inflated production lead times."

Mario Masellis, vice president of sales and marketing for Catania Worldwide, has witnessed such pressure points firsthand as a global fruit importer of kiwifruit, citrus and other perishables. He points to an infographic (see page 3) released by the Canadian Produce Marketing Association

(CPMA) and Fruit and Vegetable Growers of Canada that details the effect that grower inputs – seed, fertilizer, packaging – have on the entire value chain.

"Every partner of that chain affects everyone in that chain," he says. "Think of the decisions that are made to deliver a fruit item to the retailer in the right punnet or mesh bag or bulk case, at the right weight, at the right time."

That's exactly why a perfect storm has pelted the produce industry in terms of geopolitical upheaval in Ukraine, calamitous weather events, historically high energy prices and rising wages for labour. Inflation is still stubbornly high in 2023. The Canadian Consumer Price Index rose 4.4 per cent in April from a year earlier, but grocery costs were up 9.1 per cent raising the spectre that interest rate hikes may not have peaked. Combined, these factors have resulted in produce prices that are now at record highs. Retailers trying to explain this complex global supply chain have received little empathy from either consumers or parliamentarians.

"Yes, the selling prices have changed but the margins haven't for retailers," says Masellis, explaining that recent record profits come from increased volumes relative to pre-pandemic sales. "There's been a lot of compromise from farm to plate to manage prices with cuts into everyone's margin. And all of these negotiations depend on your partnerships."

In today's context, those relationships span the world. Pointing to his company's kiwifruit purchases from New Zealand, Italy, Greece and Chile, Masellis explains, "Exchange rates have a huge bearing on whether a business transaction makes money, especially with delays in delivery time. For example, I may buy produce in euros, transport it in U.S. dollars and then sell in Canadian dollars."

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Minor use priorities PG 18

AT PRESS TIME...

Most Jamaican seasonal workers satisfied with living conditions

Claims of alleged abuse of seasonal agricultural workers were headline national news in August 2022. But those spurious claims of “systemic slavery” by the Migrant Workers Alliance for Change have been refuted by the Jamaican Ministry of Labour.

Karl Sumuda, Jamaican Labour and Social Security Minister, reported to his Caribbean island House of Representatives on April 27, 2023 that more than 70 per cent of respondents believe that the treatment from their employer was either “good” or “very good.” The report is based on a fact-finding team that conducted 70 farm visits across Canada. The visits were to employers.

Although some situations were noted as not perfect, the team found that most of the Jamaican employees of the Seasonal Agricultural Worker Program (SAWP) were satisfied with their working and living conditions. Sumuda footnoted that there were pockets of poor labour and industrial relations conditions, particularly outside of Ontario.

However, of the 9,249 Jamaican SAWP workers employed in Canada in 2022, the majority (6,508) are in Ontario. The province stands out in the report, both in terms of workers’ above-average satisfaction with the liaison services in that province, as well as the more positive ratings of workers’ reported



experience in that province compared to the national average.

“I am not saying that the place is perfect by [any] means, I am not saying it’s a perfect situation. But the fact of the matter is, when asked specifically if the farm owners treated them with respect, 87.1 per cent said yes,” Samuda said.

He informed that 73.7 per cent said they willingly worked on their days off in order to earn more money and not by force, noting that 2.5 per cent felt as if they were being forced. Approximately 93.6 per cent of workers said that they do not work when ill, and among those who work during illness, one in five workers said they did so because they feared losing their jobs.

Also, 35 per cent of respondents sought health care and of that number, one in 10 said they did not receive access to health-care. Some of the reasons cited for lack of access include non-acceptance of health cards by doctors and the exclusion of certain health services from coverage such as tooth extraction.

As it relates to transferring workers between farms, Minister

Samuda said that 85 per cent said they were never relocated during the period of their contract, and those who were transferred, said that this was typically due to the completion of work on their previous farms.

Sixty per cent said they worked exclusively in the fields, 8.8 per cent worked in greenhouses, and 7.6 per cent worked in packing houses.

The Minister noted that 70 per cent of the contracts ranged between five and eight months, but just under 30 per cent were on eight-month contracts. “We want to extend more on eight-month contracts, but that depends on the type of crops,” he said.

In terms of living conditions, Samuda said this varied across Canada, noting that most of the workers rated their situation as “good” and “very good.” “Seventy per cent of respondents gave positive reviews of their housing and living conditions, with 30 per cent saying they were excellent and 40 per cent saying they were very good. In terms of cooking facilities, 30 per cent said excellent and 48 per cent said very good. In terms of bathroom facilities, 24 per cent said excellent and 44.8 per cent said good.

“What we have found is that there were very few issues that rose to the level of what was described as a ‘slave-like’ environment, and I think a lot of the workers were a bit upset [by that characterisation],” said Robert Morgan, Jamaican minister without portfolio with responsibility for information.

NEWSMAKERS

The Canadian Produce Marketing Association (CPMA) held its biggest convention and trade show ever from April 25-27, 2023! More than 4,200 attended the Toronto event.



L-R: Steve Bamford, CPMA convention chair; Trevor Jones, MPP Chatham-Kent-Leamington; Mario Masellis, CPMA 2022-23 chair; Scot Davidson, MP York-Simcoe; Lianne Rood, MP Lambton-Kent-Middlesex; Ron Lemaire, CPMA president.

Heartly congratulations to the following CPMA award winners:

- Fresh Health Award – **Mucci Farms**
- Young Professional Award – **Greg Palmer**, Loblaw Companies Ltd.
- Lifetime Achievement Award – **Sam Silvestro**
- The Packer’s Produce Person of the Year Award – **Mario Masellis**, Catania Worldwide
- Best Island Booth Award – **EarthFresh** (booth 820)
- Best Inline Booth Award – **Highline Mushrooms** (booth 310)
- Best First-Time Exhibitor Booth Award – **Lucid Corp** (booth 1923)



EarthFresh booth

In post-convention news, CPMA announced that **Colin Chapdelaine** is the new 2023-2024 chair. A produce veteran of more than 25 years, he is currently the president of Berry Operations at Star Produce and has served on the CPMA Board from 2007 to 2012 and then from 2015 to present. He is also a member of CPMA’s Executive and Human Resources Committees and is currently the vice-chair of the Association’s Industry Technology Advisory Committee. He plans to prioritize crucial areas that significantly affect the industry, such as innovation and sustainability, while also addressing key supply chain challenges.



Colin Chapdelaine

Garlic Growers of Ontario held its annual general meeting in late April, re-electing **Joann Chechalk** as president for a three-year term. Joining her is **Martin Van Raay**, **Bob Romaniuk** and **Nathan Teetzel**.

The British Columbia Vegetable Commission has elected its 2023 board. **Derek Sturko** is chair. Directors are **Armand Vander Meulen**, greenhouse crops; **Natalie Veles**, independent; **Craig Evans**, independent. Newly elected directors are **Hugh Reynolds**, storage crops; **Kevin Husband**, storage crops; **Paul Guichon**, storage crops; **John Newell**, greenhouse crops; **Michael Minerva**, greenhouse crops.

Congratulations to **Pierre Petelle**, president and CEO, CropLife Canada. He was honoured at the annual Spring Dialogue Days for his 15 years of service to the organization.



L-R: Pierre Petelle and Dr. Lorne Hepworth

A new \$1-million research chair in an emerging field at the University of Guelph is intended to make agri-food production more efficient and ensure sustainable food production in Canada and around the world. **Dr. Tongzhe Li** has been appointed the Arrell Family Chair in Behavioural and Experimental Economics. She will support students and seed projects and enable the hiring of a lab manager for a growing research lab in the Department of Food, Agricultural and Resource Economics (FARE) within the Ontario Agricultural College (OAC).

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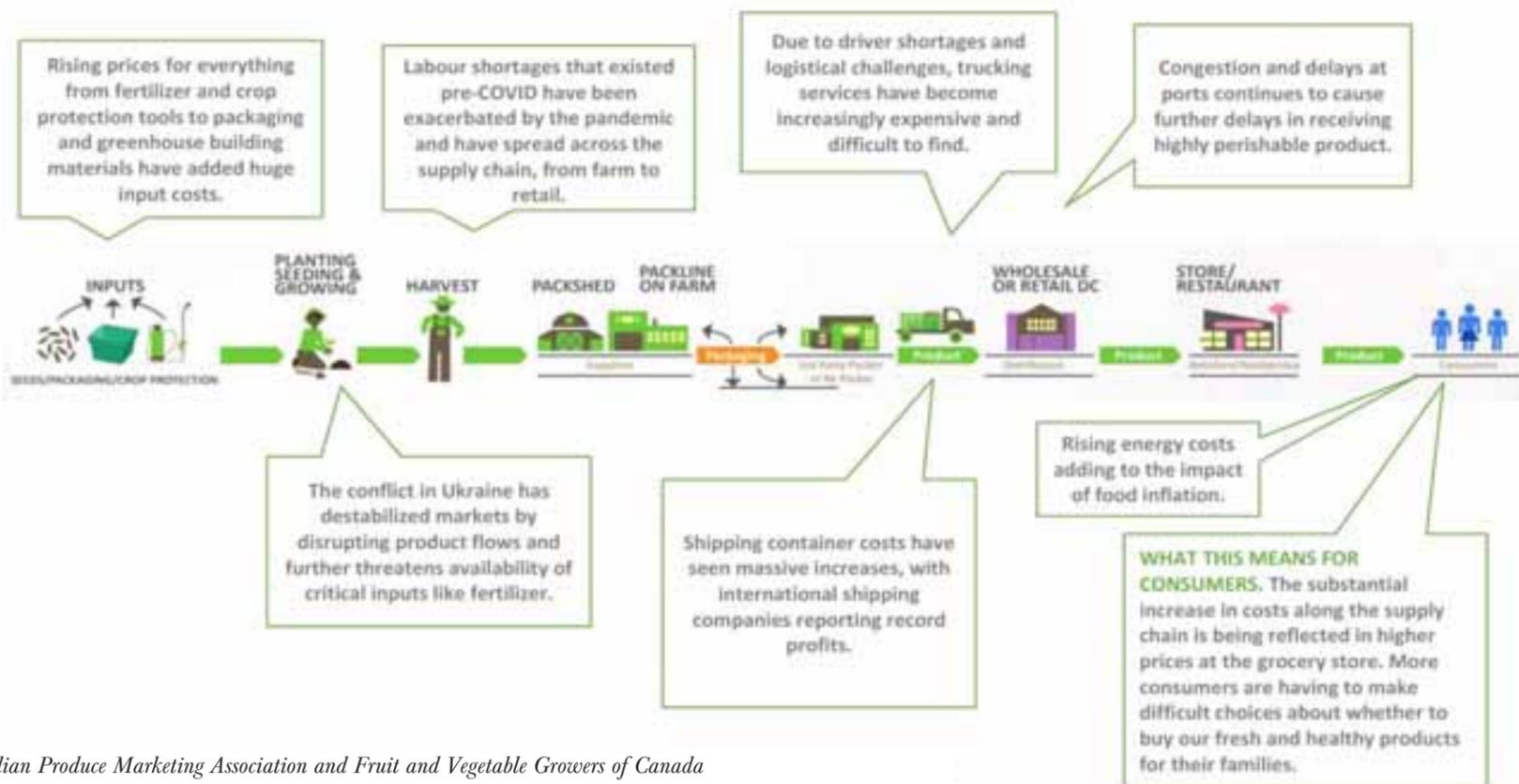
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COVER STORY

Why joint pain still afflicts the supply chain

CHALLENGES IN THE PRODUCE SUPPLY CHAIN IMPACTING THE PUBLIC



Source: Canadian Produce Marketing Association and Fruit and Vegetable Growers of Canada



“Friendshoring can shorten supply chains and cost but it is not traditionally a recipe for international growth. If this trend intensifies, the question is what strain could that place on our Canadian infrastructure and traditional trading patterns. ~ RON LEMAIRE

Continued from page 1

For Kirk Kemp, owner of Algoma Orchards, Newcastle, Ontario, choosing the right port of entry has never been more important. In spring 2023, he used the Port of Philadelphia to bring in Argentinian pears for a retail customer in the Greater Toronto Area.

Ocean freight costs have come down to close to pre-pandemic rates, but the choke point can be a port. It doesn't take long for any cost savings in seacans to be negated by delays in off-loading and trucking the last mile.

The CPMA's infographic detailing these dependent relationships conjures images of human anatomy. The hip and knee are connected both structurally and functionally. A tendon runs along the outside of the leg, connecting a band of muscles from the hip to the knee. When a problem develops in the hip, it can cause the knee to ache as well -- a phenomenon called referred pain.

Ron Lemaire, CPMA president, has observed this phenomenon in his role as chair of the Global Coalition of Fresh Produce, a group that coalesced in the cauldron of the pandemic. The impetus for

the coalition was negative consumer perceptions about the high costs of fruits and vegetables.

(<https://producecoalition.net/>)

“We want to preserve the share of voice for the global fruit and vegetable industry in a complex macro-economic environment,” says Lemaire. “Fruits and vegetables are too important to human health not to have policy makers of every stripe at the table. We need to engage all relevant industries whether that's energy, shipping, packaging, fertilizers or retail.”

The coalition plans to release results of a member survey in June 2023. A sneak peek shows that 60 per cent of the respondents reported that they have not been able to adjust the selling price in line with increases in operating or production costs. And just under 70 per cent say that ongoing impacts from production and shipping costs will not abate before the end of 2023.

“We have reached a tipping point as consumers do not want to pay more yet it is costing growers more to produce,” Lemaire says. “The pressures to spread these costs across our supply chain are insurmountable.”

Armed with these statistics, Lemaire hopes to convince policy makers about needed improvements to transportation networks. The vision is for integrated, multimodal transportation solutions. Ports play a big role because they are hubs for trains and trucks which transport goods to inland consumer markets. For starters, he'd like to create priority lanes for imported fresh produce to ensure quick offloading and transit from seaports.

As Lemaire shared with attendees to the CPMA convention in Toronto in late April, clearly there is some urgency to find solutions.

“In 2023, we are seeing the formation of two geopolitical blocs between East and West so the question becomes will this create a new cold war, with both blocs

having highly integrated commercial systems,” said Lemaire.

“We don't know what this will mean politically but in business we are seeing the growth of friend shoring, which is manufacturing in and sourcing from countries that are geopolitical allies. This can shorten supply chains and reduce costs, but it is not traditionally a recipe for international growth. If this trend intensifies, what strain will that place on Canadian infrastructure and our traditional trading patterns?”

Inarguably, the pandemic has laid bare the interconnectedness of the global produce chain. Lemaire's challenge -- and for those in leadership roles -- is to help calm the joint pain in the short term. However, major surgery is likely required to improve infrastructure in the mid-term.

Editor's note: for two sidebars, see page 12.

The Grower is “Digging Deeper” with Ron Lemaire, president, Canadian Produce Marketing Association, based in Ottawa, Ontario. He shares a global perspective of the challenges facing the supply chain and what adaptations could make the Canadian food system more flexible. This podcast is sponsored by Cohort Wholesale.



CROSS COUNTRY DIGEST

BRITISH COLUMBIA

Inaugural Canadian Cherry Month kicks off July 15

It's for good reason that the BC Cherry Association (BCCA) is launching Canadian Cherry Month July 15-August 15, 2023. Most of Canadian sweet cherries – 95% – are grown in British Columbia by more than 400 growers who market 20,000 tonnes each year. BC cherries are highly prized in export markets, but there's a hungry domestic market too.

"We are thrilled to launch the inaugural Canadian Cherry Month and to recognize the incredible contributions of cherry growers to Canadian agriculture, the economy and food supply," said Sukhpaul Bal, president of the BCCA. "We invite all

Canadians to join us in celebrating this delicious and nutritious fruit and to support our Canadian cherry industry by enjoying the best tasting cherries in the world."

From July 15-August 15, 2023, Canadians can participate in a variety of cherry-themed promotions across the country. There will be Canadian Cherry recipe contests, photo contests, and in-store retail cherry celebrations.

During Canadian Cherry Month, retail grocers are encouraged to participate in a national retail display contest. The BCCA will provide downloadable, customizable

marketing and messaging assets to support the program as well as great prizes for contest winners. To support the program, the BCCA will be executing a national consumer campaign comprised of contests, promotions, a digital ad campaign and PR campaign.

Cherries have a long and rich history in Canada, dating back to the late 1800s when cherry trees were first planted in the Okanagan Valley. Today, cherry farming has become an integral part of British Columbia's agriculture industry.

British Columbia's unique climate and rich soils in the Okanagan, Similkameen, and



Creston Valleys make it the ideal place to grow cherries. With a mild climate, sun-drenched summers, and ample irrigation, these regions are renowned for producing some of the world's finest cherries.

The BC Cherry Association (BCCA) represents growers,

marketers, packers, researchers and industry members. The BCCA sponsors research to grow and deliver top-quality cherries to markets around the world. To view the promotional video, link here:

www.youtube.com/watch?v=2G9gtIQx3uc

ALBERTA

University of Lethbridge researchers to improve sustainable potato production

Researchers from the University of Lethbridge have been awarded nearly \$250,000 through the Agriculture Funding Consortium to improve sustainable potato production by looking at ways to reduce disease in the field and in storage and to increase production while minimizing the use of resources.

Dr. Larry Flanagan, a biology professor, has received nearly \$50,000 to test six types of potatoes used in fry and chip processing for their water-use efficiency under typical growth and irrigation practices in southern Alberta.

"Our research will benefit the potato industry in southern Alberta by providing new information to producers," says

Flanagan. "The efficient use of water in crop production in an arid region like ours is an important goal for increasing sustainable potato production."

Flanagan and partners, Drs. Michele Konschuh and Dmytro Yevtushenko from University of Lethbridge and Dr. Jonathan Neilson from Agriculture and Agri-Food Canada, will apply stable isotope techniques to identify water-efficient potato varieties for use in crop production under expected future warmer and dryer conditions that will stress available water resources.

In a separate project, Yevtushenko, a biology professor, was awarded \$200,000 to develop and validate protocols to detect

potato pests and pathogens.

"Disease incidence in both the field and in storage remains a major limiting factor in sustainable potato production," says Yevtushenko. "The aim of this study is to develop diagnostic molecular protocols for fast and reliable identification of the major existing and emerging potato pests and pathogens in Alberta."

Yevtushenko and partners, Drs. Michele Konschuh and Jie Feng, a research scientist with Alberta Agriculture and Irrigation, will focus on identifying nematodes, which are parasites, and fungal diseases like pink rot, potato stem canker and black scurf, that are known to cause substantial potato losses in Alberta.

SCENE ON TWITTER

Michel Camps @cpfarmsltd · 9m
Replying to @NickFloeg

Quite the opposite here. Been mid to high 20's since planting now. This is 21 days after planting. We are rushing to get our final hilling done and getting the water going!



The researchers expect the study will generate data and lead to the implementation of new technologies that will maintain Alberta's reputation as a leading Canadian producer of top-quality potatoes and enhance the

profitability and sustainability of the potato industry.

Source: University of Lethbridge
April 13, 2023 news release

MANITOBA

Farm to School Fundraiser raises record amount for Manitoba schools & daycares

In the 2022-2023 school year, Peak of the Market Ltd.'s Farm to School program raised a record amount of \$285,431 for schools, daycares, and organizations across Western Canada. That's more than 400,000 pounds of produce delivered.

Since 2011, schools and daycares from Manitoba, Saskatchewan and Alberta have had the opportunity to sell Peak of the Market Ltd. vegetables through Farm to School and keep 50 per cent of their total sales for infrastructure improvements, community initiatives, upgrades to equipment and technology, and more. The program also

allows participants to donate a produce bundle to local food banks.

"Peak's Farm to School is a healthy and profitable fundraiser that promotes the importance of filling half your plate with vegetables," said Pamela Kolochuk, CEO of Peak of the Market Ltd. "We are proud to support our community through Farm to School and look forward to the upcoming year."

Registration for fundraising in the 2023-2024 school year opened on May 1, 2023. Schools, daycares, and organizations are encouraged to visit www.peakfarmtoschool.com for more information on how to

participate.

"Thanks for the Farm to School program, our committee was able to raise money to eventually add to our school yard as well as help families in need within our school and community," said Christèle Childerhouse, parent and member of the Farm to School committee at École Voix des Prairies. "Fundraising for such a small group is challenging but we are happy to report that this fundraiser has been our most successful."

Source: Peak of the Market May 2, 2023 news release



CROSS COUNTRY DIGEST

PRINCE EDWARD ISLAND

Cover cropping is big trend in Atlantic Canada's potato acres

At the start of Living Lab – Atlantic in 2019, fewer than 24 per cent of acres in potato production were planted with cover crops in the fall before planting potatoes. By the end of 2022 that number doubled to nearly 50 per cent and is expected to grow through peer-to-peer knowledge transfer led by Living Lab – Atlantic participants and funding available to farmers through the On-Farm Climate Action Fund.

Dr. Judith Nyiraneza, an Agriculture and Agri-Food Canada research scientist, co-leads the cover crop research that has spanned four years. While involving several farmers and other researchers, she also works with PEI Potato Board research and agronomy specialist Ryan Barrett and Brandon MacPhail from MacSull Farms Ltd.

Dr. Nyiraneza, Ryan, Brandon and other participating farmers recently completed Living Lab – Atlantic research activities that set out to “uncover” the ideal use of cover crops within potato cropping systems and how they can be planted several times throughout the year, with varying benefits to farmers and their soil.

At AAFC's Harrington

Research Farm, Dr. Nyiraneza studied full-season cover crops that are planted over an entire growing season then plowed into the soil in the fall, prior to planting a potato crop the following spring. She tested a broad range of crops including grasses, legumes, and a mixture of legumes and grasses and found that pearl millet returns the highest carbon input into the soil. Pearl millet and sorghum sudangrass were associated with lower risk of soil nitrate leaching and higher total potato yield.

In another study, Dr. Nyiraneza evaluated winter cover crops planted in early to mid-September prior to planting potatoes the following spring. She found that winter cover crops, such as winter rye or winter wheat, reduced both soil erosion and nitrate leaching proving to be beneficial to the environment. Not only does winter rye and wheat recover quickly in early spring, they can provide additional protection during snow melt when risk of soil erosion is very high. Plus, farmers can also harvest it as a second cash crop. If harvested, winter wheat yield ranged from 4.5 to 7.6 tons per hectare and winter rye ranged



“Cover crops offer many benefits such as reducing soil erosion, gathering valuable nutrients into its roots, reducing soil diseases and acting as a good source of carbon, a key indicator of soil health.”

- DR. JUDITH NYIRANEZA, RESEARCH SCIENTIST, AGRICULTURE AND AGRI-FOOD CANADA

from 3.2 to 5.1 tons per hectare.

Ryan Barrett has spent the last four years working with farmers, such as Brandon MacPhail, across the island to study fall-seeded cover crops. These cover crops are planted after harvest of a cash crop or after tillage to prepare for next year's crop. They include common grain crops such as barley or oats, as well as newer crops to PEI such as daikon radish. MacPhail and other participating farmers contributed to cover crop testing

and research by supplying the land, seed, equipment, time, and staff to undertake the crop management practice.

Along with researchers, they determined which crops to plant as cover, in which fields, and for which production crops to follow. Barrett used splash pans in cover crop fields to measure the soil's vulnerability to be moved through erosion. Splash pans were introduced by Dr. Nyiraneza and tested in previous studies. They are simple ways to

measure the soil particles splashed by raindrops. Nitrates in the soil were measured at different times throughout the fall, and soil health tests were performed before and after cover crops were grown.

The data that Barrett and participating farmers unearthed was a huge endorsement for cover crops.



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GREENHOUSE GROWER

How best to cool irrigation water



A research project at a southwestern Ontario greenhouse has found a sustainable method to cool the water that growers use to irrigate their greenhouse vegetable crops - improving both plant health and fruit quality in the process.

Using funding from the Greenhouse Competitiveness and Innovation Initiative (GCII), Under Sun Acres Inc. has identified that water from a greenhouse's stormwater management pond can be used to bring irrigation water to the ideal temperature the crops need, as opposed to using an electric or gas-powered cooling unit.

Irrigation water used for greenhouse crops is a combination of fresh water from natural sources such as wells and ponds, municipal sources, leach water that is disinfected and recirculated from within the greenhouse environment, and fertilizer. The ideal temperature for irrigation water is approximately 20-22°C throughout the growing season.

"Growers mix fresh water from the municipality with treated leach water to use for irrigation, but when it is 32°C in the greenhouse in the summer, the treated leach water is the same temperature," explains Lucas Semple of Under Sun Acres

Inc. "As you lower the temperature of the irrigation water, it increases the health of the plant by reducing plant stress."

A lot of greenhouses, including Under Sun Acres, already use water from their stormwater management ponds to cool the fresh water they get from municipal sources, but they have no control over the temperature of the treated leach water. Its temperature would stay high no matter how much the municipal water was cooled unless they use cooling units.

"We began pulling water from our pond and using a heat exchanger to cool the treated leach water, which lets us cool and control it," he says. "The unknown for us was the pond - how will the pond water react and is the pond cool enough throughout the summer, for example?"

On top of the heat exchanger equipment, Semple installed a series of temperature sensors in the pond to monitor water temperature at different spots and help track where to take the water from during the growing season for the best results. The key is not being too aggressive in extracting cool water from the bottom of the pond early in the season so the pond water will still be cool enough to meet their temperature requirements

during the hottest days of summer.

"This was a new process, and we don't know of anyone else using pond water in this way," he says. "Simply put, irrigation water temperatures are too high in the summer, and we've been able to prove that it does work to use pond water to cool fresh and treated leach water for greenhouse irrigation."

The size and depth and amount of rainfall have a large influence on cooling capacity of the pond. Semple found, for example, that the pond's average temperature can increase by up to 1°C after big rainfalls. They're now looking to cover the pond to reduce the impact of rainfall and solar radiation on its water temperature.

When greenhouse operators are planning to build a new stormwater retention pond, which is required for all site plan approvals, Semple encourages them to consider how else the pond can be used. This may require some additional design work related to volume and depth at the onset but can provide added future benefits.

Semple worked with researchers from the University of Windsor on the project, which he feels is one of the biggest benefits

from accessing GCII funding.

"Helping us make that industry-academic partnership for a plant health project like this was a really big outcome as a result of GCII," he says. "Any new project you're doing is a risk to the grower, and when there is risk, it greatly helps to have funding support through a program like GCII."

"Ontario's greenhouse growers have long proved that they are adaptable and at the leading edge of operational enhancements," says Lisa Thompson, Minister of Agriculture, Food and Rural Affairs.

"Through the Greenhouse Competitiveness and Innovation Initiative, our government is helping greenhouse growers find sustainable methods to increase efficiencies, reduce energy costs and protect the environment."

This project was supported through the Greenhouse Competitiveness and Innovation Initiative, a cost-share program funded by the Ontario government and delivered by the Agricultural Adaptation Council, on behalf of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

Source: Agriculture Adaptation Council

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SCAN ME

GREENHOUSE GROWER

How to spot seedless cucumbers under stress



Figure 1

DR. MOHYUDDIN MIRZA

Seedless cucumber is a fast-growing crop compared to tomatoes and peppers. One can start harvesting as early as 50 days from seeding while tomatoes take 100 to 100 days and peppers up to 130 days. Cucumbers, therefore, react quickly to changes in temperature, humidity, nutrition and stresses.

At press time, mid-May, we are currently dealing with hot temperatures and smoke in the western provinces and cucumbers are reacting by aborting cucumbers (Figure 1).

There are multiple signals these cucumbers plants are sending.

- Very dark and droopy leaves.
- Thick stems and also thick leaves
- Very dark green leaves
- Fruit abortion, as if the plant

suddenly decided not to feed the cucumbers

Understanding these signals and corrective actions:

1. Plants are very vegetative. Thick stems, dark green and thick leaves, leaves not in “prayer” mode. The “prayer leaves” term is used where leaves are spread and the strong petiole is upward looking. They appear to be oriented in such a way that they are trapping maximum sunlight.
2. These plants became more vegetative due to cooler night temperatures in February. So adjust night temperature to 20-21°C and day temperature to 22-23°C.
3. From a plant viewpoint, any food made through photosynthesis is being sent to roots, shoots and flowers but not enough food is being sent to the fruits.

4. The picture above indicates how plants reacted to the grower’s management practices.

5. The fertilizer program in the above case was more heavy in ammonium nitrogen compared to nitrate nitrogen. Avoid ammonium-based fertilizers especially where water is used as a growing medium and also in hydroponics systems.

6. Figure 2 shows how the plant was sending a large portion of food resources to massive roots. In figure 3 you can see the leaf coming out of a node where fruit has developed. Remove this leaf and also check your night temperature. It is probably cooler than the recommended range. Another vegetative signal.

Growers must be aware of many strategies to make plants vegetative or generative. If you



Figure 2



Figure 3

want good harvests, then you must keep a balance between these two growth stages.

Dr. Mohyuddin Mirza is a greenhouse industry consultant based in Edmonton, Alberta.

Pure Flavor publishes spring e-magazine

Headquartered in Leamington, Ontario, Pure Flavor is sharing the power of greenhouse growing year-round in the brand’s quarterly Live Deliciously eMagazine. The 10th edition of the award-winning series explores how the brand’s advanced greenhouse tech enables the growing of fruits and vegetables consistently year-round, regardless of weather conditions and location.

“We want to show consumers what’s behind the glass so they can see how we are growing forward with state-of-the-art technology and sustainable growing practices”, said Chris Veillon, chief marketing officer. Throughout the eMagazine, readers can learn more about how Pure Flavor practises climate-friendly growing in its greenhouses, reducing its

environmental impact and enhancing its social responsibility — a message that resonated during recent Earth Day celebrations in late April. People who download the eMagazine can also meet some of the people behind the magic: the dedicated growers and crop specialists who work hard to produce high-quality vegetables every day.

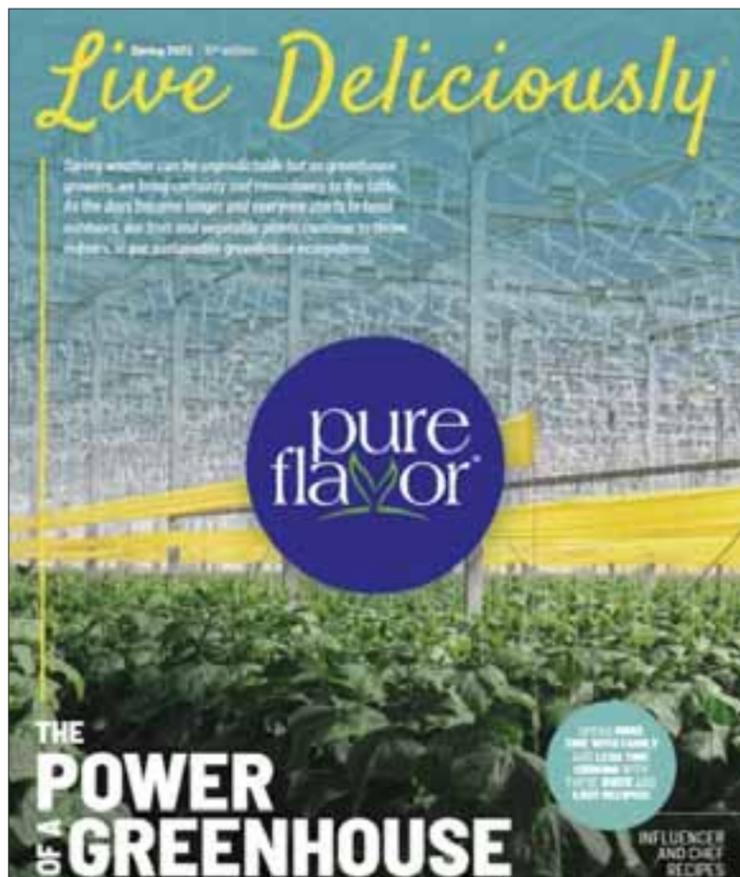
“We want to build trust and confidence in our brand by informing and empowering consumers to make smart choices when buying fresh produce,” continued Veillon. “We believe that when consumers know exactly how their food is grown and meet the passionate people working in our greenhouses, they can enjoy it more and benefit from its freshness and quality.”

The eMagazine offers tips and recipes for the Ultimate Spring

Brunch, which is especially helpful with Mother’s Day around the corner, as well as plant-based eating tips, recipes, and more. With contributions from influencers across North America, the edition aims to inspire readers with mouth-watering recipes, such as a Vegan Shakshuka recipe from Hope Monaco, meal planning tips from registered dietician nutritionist Chelsea Leblanc, and tips for creating a positive relationship with food for wellness from Evelyn Arguelles.

To access the eMagazine, visit <https://www.pure-flavor.com/live-deliciously/> and download it for free, or download it on your eReader using Apple Books or Google Play Books.

Source: Pure Flavor May 8, 2023 news release



PERSPECTIVE

Labour section has its work cut out: defraying housing costs, expanding source countries, navigating TFW programs



BILL GEORGE

My name is Bill George. I'm a grape grower from Niagara and past chair of both Ontario Fruit and Vegetable Growers' Association (OFVGA) and the Grape Growers of Ontario.

At the annual general meeting this past February, I agreed to take on the role of serving as the OFVGA's labour section chair. Labour has always been a high priority file for this organization, and although the turmoil of the COVID years is now largely behind us, there is no shortage of activity to keep me, our committee members and OFVGA's labour policy advisor Stefan Larrass busy.

Here are some of the key issues that we're currently working on:

Making the case for public investment into the edible horticulture sector

Local employees are increasingly difficult to find, so many growers rely on international workers to make up a significant portion of their on-farm workforce. Growers must provide housing for their international workers in Canada, and both the government and the public have increasing expectations about the quantity and quality of amenities that these accommodations should provide.

These amenities come at costs to growers that can't be recovered through the marketplace. These are costs that negatively impact the financial viability of farm businesses. That's why we are developing a white paper that makes the case for public

investment into the edible horticulture sector and highlights the importance of targeted government investments to support farm employers with these kinds of unrecoverable costs.

Exploring additional source countries for Ontario employers of international farm workers

Our committee is in the early stages of exploring options for expanding Ontario grower access to reliable, high-quality workers from countries in Central America and beyond. This includes documenting what has worked well in the past, such as the significant expansion in recent years of the ag stream of the federal Temporary Foreign Worker (TFW) program for workers from Guatemala.

We've heard from growers that they value the certainty and the reliability of the processes in place for hiring offshore workers from well-established source countries such as Jamaica, Mexico and Guatemala. At this year's annual meeting, growers provided clear direction to work with our industry partners to explore additional countries that could be sources of offshore workers with the same level of reliability, convenience and quality as the existing set of countries.

It's important that we continue to expand our labour pool to address the growing need for international workers. However, it's also about managing risk to our sector to ensure growers have options in case access to any existing source countries is interrupted or diminished because of changes in worker availability or unilateral changes in a country's policies towards Canada's international worker programs.

Sharing knowledge with growers

We are aware of the great level of interest among growers, and in some cases their HR staff, to learn more about recent features of the ag stream TFW program, and how fellow growers are using those in their

businesses.

We hosted a well-attended farm panel on this topic at the Ontario Fruit and Vegetable Convention this past winter, and more sessions are planned. Work is also underway on the development of online resources that could be used by new and existing users of the TFW program to help them navigate various employer processes in the TFW program.

And we welcome your input! If you have ideas on topics or specific TFW program processes that you feel could benefit from an educational session or an online resource, please contact Stefan Larrass at slarrass@ofvga.org.

Ongoing issues

And of course, our section also deals with ongoing labour issues as they come up. A recent one has been the release of a fact-finding report by the Jamaican government into working conditions on Ontario fruit and vegetable farms.

The independent taskforce that conducted the investigation and wrote the report validated what our industry has been saying for years – although there is always room to do better, a large proportion of Jamaican farm workers have a positive view of the Seasonal Agricultural Worker Program (SAWP), and the vast majority of Ontario farm employers using the program are operating within its parameters.

Furthermore, the report

categorically stated that there was no evidence to support activist claims that the program's working conditions were akin to systemic slavery. It was these dramatic allegations that triggered the thorough investigation of SAWP by the Jamaican government last year.

Through our More than a Migrant Worker initiative, we are also making a concerted effort to promote the many positive aspects of our government-regulated international worker programs and that these workers have rights and protections that vulnerable undocumented workers without legal work permits do not have.

Bill George is chair, labour section, Ontario Fruit and Vegetable Growers' Association.

WEATHER VANE



Amanda Dooney, Suncrest Orchards, values her Jamaican temporary foreign workers like family. New housing was built for them two years ago at the farm near Simcoe, Ontario. Photo by Glenn Lowson.

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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

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THE GROWER

THE URBAN COWBOY

Make automation technology relevant to growers, says report



OWEN ROBERTS

- Horticulture adaptation to fit automation
- Sector scans of available technologies and top needs for different crops
- Specific applications such as automated de-leafing, automated crop-lowering
- System integration

The participants noted the high cost of research overall as a major impediment to the sector, with its inherent challenges. For example, high variability among crops or growing regions means large data sets and extensive data

collection times are required. Some have harsh environments, requiring expensive, robust electronics.

But all challenges aren't confined to the lab.

Participants cited problems connecting with growers during automation technology development. They said many growers are not willing to participate in trials due to potential liabilities, high financial cost and time commitment. As well, they noted how horticultural industry connections – and indeed, those

throughout the agri-food sector -- are made by word of mouth and personal relationships.

"That makes it difficult for new entrants in the market to build trust," according to the report.

Finally, they said technology is sometimes not seen as necessary. Nonetheless, they seem determined to stake a place in the sector.

"As the sector matures, an opportunity exists to understand and address challenges and make a strategic and coordinated effort

for the next five years and beyond," the report concludes. "The time is ideal to increase collaboration, data sharing and identify business and partnership models for successful validation and implementation of automation technologies in supporting the horticultural sector."

Owen Roberts is a past-president of the International Federation of Agricultural Journalists and a communications instructor at the University of Illinois.

Five years ago, advancements in automation in horticulture were mostly a dream.

But so were the likes of university assignments that write themselves, hit songs performed by computers and virtual fitness instruction from your home treadmill.

Technology continues to find new niches, right across the board. And that presents a huge opportunity for growers and processors who take action now and capitalize on the potential, according to a new report from the Vineland Research and Innovation Centre.

Earlier this year, the centre brought together 26 horticulture stakeholders, including nine from The Netherlands and three from the U.S., to discuss the state of horticultural automation.

Their goal was to understand challenges and opportunities facing automation, how the companies see the best opportunities and how they can be connected to enhance impact for the sector.

Most of them and the 22 companies they represent were not even in business five years ago. They're seeing the present and the future through a new lens, including the need to collaborate to validate automation technology.

"Validation is about building trust for your technology, demonstrating not only its functionality but also its usefulness and reliability while providing a return on investment," according to the Vineland report, which was issued in March 2023.

"Growers can then see [automation technology] for themselves to ensure it meets their expectations before investing financially and operationally," according to the report.

However, many industry professionals did not feel new technology development was the domain of conventional research institutions. Instead, they said, such institutions should instead focus on optimizing technology and developing tools such as data management software and public data sets to streamline efforts.

Besides technology validation and product demonstrations, the participants cited these research needs:

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NEW TECHNOLOGY

Blue Mountain Fruit Company hosts open house for state-of-the-art packing plant

KAREN DAVIDSON

Years in design and months in construction, Blue Mountain Fruit Company can now boast one of the most advanced apple packing operations in the country. Marius Botden, president, and his wife Irma have led the family-driven business through the pandemic to new success in Thornbury, Ontario.

“About 60 per cent of the throughput is from the family’s own apple orchards, with 40 per cent derived from neighbouring farms,” explained Botden at the May 12, 2023 industry tour.

Not so long ago, in 2001, the pair immigrated from the Netherlands with the dream of building a legacy for their children. As owners of Botden Orchards Ltd., they brought new management practices: high-density orchard plantings, precision GPS planting, drip irrigation, eco sprayers and advanced pre-sorting and grading systems. They also negotiated the rights to become exclusive



Gerbe Botden, orchard manager, Blue Mountain Fruit Company, stands in front of 24 flumes. In the background is a sorted apple bin that’s being transported by a Greefa iBin crane to be stacked with other graded fruit of the same size and quality.

growers of the Red Prince apple in Canada, importing rootstock from their nursery in the Netherlands.

By 2013, Botden Orchards became a fully integrated operation as a grower/packer/shipper with the acquisition of Blue Mountain Fruit Company. A new milestone was achieved in 2017

with the acquisition of Binkley Apples.

Irma Botden explains, “The second generation is fully engaged in the operation with Gerbe Botden as orchard manager, Gitty Botden as plant coordinator and Sacha Botden as production manager ensuring philosophical continuity.”



This robotic arm plucks the right-sized Red Prince apple for a nesting carton.

Highlights from the tour include:

- Greefa automatic tray packer, IQS Performance plus external quality grading on Geosort 4 lane pre-sort line
- Haley Manufacturing Inc., automatic tray inserter, pouch

bagger, poly bagger

- TOP Inc., robotic apple bags loader
- Blue Mountain Fruit Company Inc., gravity box drops, case conveyance with vision technology

COMING EVENTS 2023

- June 1-2 Dispute Resolution Corporation Annual General Meeting, Whistler, BC
- June 5-11 Ontario’s Local Food Week
- June 7 Ontario Produce Marketing Association Annual General Meeting & Summit, Rockway Vineyards, St. Catharines, ON
- June 10 Garlic Growers Association of Ontario Field Day, Farm of Felix Furmanek, Arthur, ON
- June 11 Ontario Agricultural Hall of Fame Induction Ceremony, GrandWay Event Centre, Elora, ON
- June 13-15 GreenTech, RAI Amsterdam
- June 15-16 United Potato Growers of America Crop Transition Conference, Minneapolis, MN
- June 27 Ontario Tree Fruit Technology Day, Simcoe, ON
- June 27 – July 3 International Federation of Agricultural Journalists World Congress, Olds, AB
- June 28 First Annual Ontario Potato Board Industry Social Golf Tournament, Nottawasaga Inn Resort & Conference Centre, Alliston, ON
- July 5 Potato Growers of Alberta Grand Opening Head Office, Taber, AB
- July 6 Potato Growers of Alberta Golf Tournament, Taber Golf Club, Taber, AB
- July 13 Haskap School, Agriculture Building, University of Saskatchewan, Saskatoon, SK
- July 14 Haskap Research Tour, Horticulture Research Field, University of Saskatchewan, Saskatoon, SK
- July 19-21 Federal-Provincial-Territorial Agriculture Ministers’ Meeting, Delta Hotel, Fredericton, NB

RETAIL NAVIGATOR

What's trending at 2023 trade shows



PETER CHAPMAN



A resurgence of trade shows in 2023 proves that the industry is hungry for face-to-face engagement. In April, the Canadian Produce Marketing Association (CPMA) event in Toronto hit a historical record with more than 4,200 attendees. SIAL, a food and beverage show in Montreal, was also well attended in May.

Here are my topline from attending CPMA and SIAL.

Sustainability is still very important. Many different packaging ideas are available. Mesh baskets in produce, paper bottles (with a liner) and compostable plastic wrap were all interesting. The end result is good for the environment but more work is required to make these options efficient in a high-volume plant situation.

CPMA had an entire section dedicated to innovation. Attendees could speak to people from these businesses and get a better understanding of the innovation. They were all together which made it easier than searching the trade show floor.

Processed products are coming to the market 'less processed.' We had a period where plant-based protein products were the rage, but many were very processed. Although consumers were excited to get protein from different sources they were concerned about the amount of processing. Products this year involve less processing and will be merchandised frozen.

Air fryers are popular kitchen appliances. We saw some products developed specifically for consumers who want to cook in their air fryer. Alternative Kitchen had plant-based protein products that taste really great and have the right mouth feel.

Trade shows deliver a return when you put in the effort

Any trade show is an investment in time, resources and money – even when it's local and no airfare is required. To get the best return, homework is required before the show, during the show and after you return to work.

Before committing to any show, you should define your purpose for attending. A list of

defined goals should guide your decisions. It is also a good checklist to assess your success and your return on investment.

Your goals can be one or a few of the following:

- 1) Find new customers to grow your sales
- 2) Find a broker to represent you in the market
- 3) Find a distributor
- 4) Check out your competition
- 5) Look for new packaging or marketing ideas
- 6) Re-establish relationships with existing customers
- 7) Look for ingredient, packaging or other input suppliers
- 8) Learn from the content sessions at the show
- 9) Explore opportunities with suppliers for logistics or other channel partners
- 10) Introduce new ideas, flavours or concepts to gauge industry feedback

Remember, you probably can't do it all so identify the priorities that will benefit your business the most. Once you know why you are attending it is beneficial to think about some strategy to ensure you come home with the sales or other resources for your business.

For more on trade show strategy, go to Contributors at www.thegrower.org.

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 SKUFood. Peter works with producers and processors to help them get their products on the shelf and into the shopping cart.

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FOCUS: SUPPLY CHAINS

Why ports matter to Canadian horticulture

KAREN DAVIDSON

For British Columbia cherry growers, global trade is so important that the Asian Moon Festival is on their calendars. This year's September 29th date in China, Japan, Korea, Malaysia and Singapore is the equivalent of Canadian Thanksgiving – a mid-autumn festival that revolves around feasts shared with family and friends. That's precisely the peak of market timing for late-maturing varieties of B.C. cherries.

"The Asian market is very important to us," says Richard Isaacs, commercial director, Global Fruit, B.C. "We ship to 30 countries around the world, with much of our volume either shipping out of the Port of Vancouver or flying out of the airport. Where possible we like to ship by ocean freight to arrive later in the seasonal markets, giving our customers an extended cherry selling campaign and improving returns to our growers. The temperature is also maintained much better throughout the supply chain when we use ocean containers compared to air freight, which is critical for the quality of the fruit."

During the COVID pandemic, the 2021 and 2022 seasons were challenging as supply chains broke down with reefer containers out of position, boats congested at ports and scant equipment and labour available for unloading. Transit time from the Port of Vancouver to Shanghai, for instance, could be more than four weeks with delays in unloading.

As a result, Global Fruit sent fewer cherries by ocean, pivoting to markets in the United States and Canada. "We have always maintained a very strong customer base in North America," explains Isaacs, "and during the pandemic this proved to be a very important strategy as there were fewer flights to Asia and ocean freight costs shot up while transit times increased and reliability dropped dramatically."

"2022 was better in terms of availability of ocean freight equipment, but there were still delays and high costs. 2023 will not be a return to normal, but we hope to service Asia with ocean freight with rates that are more reasonable with fewer delays and faster transit times door to door," predicts Isaacs.

One refrigerated container, with capacity for 3360 x 5kg kilogram boxes of cherries, is valued at anywhere from \$150,000 to \$200,000 depending on the size of the fruit, the variety and the time of the season.

The Moon Festival is well-timed in 2023 for B.C. growers to harvest and pack premium cherries for transport and distribution in the two weeks leading up to the holiday.

In another development, export-facing commodity growers were happy to hear that on April 20, the Canadian government greenlighted a major new container terminal, the Roberts Bank Terminal 2 in Delta, BC. About 30 kilometres south of the central port, the expanded terminal will increase capacity by up to 60 per cent. The Port of Vancouver, already Canada's largest port, processed 141.4 M metric tonnes of cargo in 2022. The numbers are staggering for raw resources such as prairie wheat, metallurgical coal, woodchips and potash/potassium-based fertilizer. These numbers dwarf the shipments of horticultural products. According to the Port of Vancouver's 2022 Statistics Overview, released May 1, 2023, the movement of outbound horticultural products totalled 35,538 metric tonnes – down about nine per cent from the previous year.

The need for expedited processes for cold-refrigerated produce exports is evident.

The Roberts Bank Terminal 2 project has been in the works for more than a decade to accommodate the interests of



Roberts Bank Terminal 2 in Delta, BC

various stakeholder groups. But with more than \$275 billion of trade handled by the Vancouver Fraser Port Authority every year and forecasted demand to grow by the early 2030s, capacity must be built.

"Any expansion of the Port of Vancouver will improve opportunities for us, if that means more boats leaving more often," says Isaacs.

Ports on call on eastern seaboard

KAREN DAVIDSON

How many growers have ports on their speed dial? Not many, but their brokers do.

Algoma Orchards, headquartered in Newcastle, Ontario has occasion to use the Port of Philadelphia. Recently, their container of Argentinian pears arrived in the Port and the goods were trucked to the Greater Toronto Area for repacking. Look at a map and it's clear that the fastest route is through the United States and not through the Port of Montreal.

"We do this to fulfill the need

of a retail customer," explains Kirk Kemp, owner, Algoma Orchards. "Ports are very important to us."

Philadelphia is one day away by truck from eastern Canadian importers. Located on the Delaware River, it's the number one fruit gateway in the United States with an extensive network of refrigerated warehousing servicing reefer cargo. According to its website, last year 36 per cent of its 7.4 million tons of cargo arrived by temperature-controlled containers.

PhilaPort, as it's known, is home to the Philadelphia Wholesale Produce Market, the

world's largest fully-enclosed, fully-refrigerated wholesale product market. Of note is a 18,000 square-foot recycling and waste processing facility that services the market. It provides environmentally-friendly recycling of cardboard, pallets and plastic packaging materials as well as sanitary discharge of organic waste.

Philadelphia is not the only eastern seaboard port handling perishables. The Port of Halifax is gaining traction with local exporters beyond seafood. One example is Scotian Gold Cooperative which is entering its fourth season exporting apples to South East Asia. Headquartered in Coldbrook, Nova Scotia, the cooperative's 50-plus grower members are taking advantage of new markets in such countries as Vietnam and Singapore.

As Katie McNeill, Scotian Gold's key account manager, explains, "Being one hour away from a growing international port has been key to our ability to export many containers within a post-harvest window. We can have fresh apples packed and at



the pier within one business day. There have been challenges with transit times from the Port of Halifax, but as the volume continues to increase from this region, more lanes and container lines have become available."

These developments aren't a surprise to Ron Lemaire, president of the Canadian Produce Marketing Association. In mid-May, he returned from a trip to Morocco and Spain, observing, "It's no longer the case that importers/exporters are looking to provide a season's worth of fruit. Business is so competitive that if there's an opportunity to supply a two-week opening, a deal can be struck."

And ports are a key link. In

Morocco, the ports of Tangier Med and Casablanca are the hubs for exporting agricultural produce -- an important fact given that 13 per cent of Morocco's GDP is attributed to agriculture. In Spain, the giant shipping and logistics line Maersk has expanded its ocean network via the key hub port of Algeciras with the scheduled port rotation being Gijón-Bilbao-Algeciras.

"These services go beyond ocean and also includes intermodal, logistics and services products and customs house brokerage, to name only a few," says Diego Perdones, Maersk.

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FOCUS: SUPPLY CHAINS

Port of Montreal anticipates growth in cold chain capacity



In 2021, the global market size for cold chain logistics was US \$266.81 billion. A study conducted by Precedence Research predicts the total market size could more than triple by 2030, reaching more than US \$948.24 billion, with an average annual growth rate of 15 per cent.

North America alone represented approximately 37 per cent of the global market share in 2021, or US \$99 billion. The value of the Canadian market is estimated at US \$35 billion and, according to a recent study by Mordor Intelligence, the Canadian cold chain logistics market is expected to show an average annual growth rate of 3.5 per cent on the horizon of 2028.

An important link in the global supply chain

The refrigerated products market is influenced by the rapid growth of the world population (particularly in Asia and Africa), growing urbanization, improving living standards, and the emergence of a middle class.

The perishable products market is dominated by the fruit trade, estimated at 42 per cent, in which bananas occupy the primary position. This is followed by fresh vegetables (21%), cold cuts (19%), seafood (14%), and dairy products (2%).

Global trade in perishable products represents about 208 million tons. About 90 per cent of perishable products are transported in refrigerated containers equipped with motors to generate cold and provide air circulation. Reefer containers allow flexibility in the preparation and packaging of perishables, the size of shipments, the frequency of turns, and in intermodal transfers.

Montreal, a cold chain hub

The Port of Montreal is the leading port in Atlantic Canada in the distribution of fresh, chilled, and frozen products. It plays an important role in the distribution chains of perishable products in Québec, Ontario, Western Canada, and the Midwest of the United States, particularly those that use

maritime transport to do business with overseas markets. Port of Montreal container terminal carriers have access to a storage capacity of 1,710 refrigerated containers. The port is firmly positioned in the handling of perishable products, with transport streams estimated at 3 million tonnes per year. The Port of Montreal handles an average of 410 refrigerated containers per day.

With a new container terminal located in Contrecoeur on the south shore of the St. Lawrence scheduled to be commissioned in the last quarter of 2026, the Port of Montreal will strengthen its position by increasing the supply of perishable products on a global scale.

A booming market

The growth of the cold chain market creates business opportunities to attract high value-added merchandise. The market for perishable products is on the rise, and the use of refrigerated containers is steadily becoming more important. This increase is attributed to increased consumer demand for fruits and vegetables that cannot be grown in their home market. But other factors come into play, including the growing number of trade routes, the expansion of e-commerce, and the global rise in the disposable income of developing countries.

Moreover, the range of perishable products is expanding rapidly with the need to refrigerate sensitive electronic parts and computer chips in transit.

There is also a modal shift of heat-sensitive goods from air to maritime transport. The capacity of refrigerated containers deployed by the world's 10 main container shipping companies on regular lines is estimated at 2.5 million containers. The weight of maritime transport of perishable products internationally represents 146 million tonnes, or the equivalent of 3,500,000 containers. Trade should continue to grow by 4 per cent per year to reach 7 million TEUs (Twenty-Foot Equivalent Unit) by 2030.



However, the cold chain is an energy-intensive industrial activity. The development of refrigerated containers requires specific equipment both on board ships, where hundreds of electrical outlets must be functional, and in port container terminals which have locations for the electrical supply of containers. It is estimated that around 35 per cent of the energy consumption of port terminals supplies cold chain infrastructures. Global growth in demand for perishable products and expanding global supply chains are expected to dramati-

cally increase energy demand and carbon emissions. Refrigerated containers account for a large part of a port's energy bill, hence their importance in port energy policy towards a low-carbon cold chain.

Conclusion

Cold chain stakeholders face significant challenges in maintaining the fluidity, safety, and security of perishable products. Canada's success in this high value-added market relies on a combination of regulatory

factors, global logistics services, smart transportation, and warehousing infrastructure.

Port of Montreal May 2, 2023 news article written in collaboration with Professor Claude Comtois, Interuniversity of Research Center on Enterprise Networks, Logistics and Transportation, University of Montreal.

An advertisement for Property 300 SC Fungicide. At the top, there is a logo consisting of a stylized flame or leaf shape in orange, yellow, and green, with the word 'PROPERTY' in bold orange letters below it, and '300 SC Fungicide' in smaller blue text. Below the logo, the text 'Residual Vapour Effect' is written in white on a dark blue background. To the right of this text are images of various fruits: a strawberry, a bunch of purple grapes, and a cluster of blueberries. The main body of the advertisement features a large photograph of a vineyard with rows of grapevines stretching into the distance under a warm, golden sunset sky. The text in this section reads: 'Property fungicide provides exceptional control of Powdery Mildew in grapes through fast acting translaminar activity complemented by a long-lasting vapour effect for exceptional bunch and canopy coverage.' Below this text, in small font, it says 'Property is a registered trademark of Ishihara Sangyo Kaisha, Ltd.' At the bottom right, there is the 'BELCHIM CROP PROTECTION CANADA' logo, which includes a stylized leaf icon and the company name. The website 'www.belchimcanada.com' is printed at the bottom left.

New research leads to improved anthracnose management in peppers

AMANDA TRACEY & KATIE GOLDENHAR

Anthracnose in Ontario field peppers has changed in some regions. Anthracnose has historically been caused by the fungal pathogens that are endemic to Ontario and mainly infect ripe fruit (Figure 1). The disease has typically been controllable through the use of fungicides applied on a 14-day interval starting after fruit set. Since 2020, a new anthracnose species, *Colletotrichum scovillei*, has been reported in multiple Ontario counties and caused severe crop loss (up to 60% in some fields). This new species is aggressive and causes severe disease when not controlled through earlier and more frequent fungicide applications.

This new pathogen, *Colletotrichum scovillei*, has been reported in South Carolina, Ohio, Brazil, China, Indonesia, Japan, Malaysia, South Korea, Taiwan and Thailand. *Colletotrichum scovillei* is part of the *C. acutatum* species complex, which can cause symptoms on immature fruit. *Colletotrichum scovillei* hosts are primarily within the pepper family.

Symptoms

Colletotrichum species are known to have latent infection periods, meaning they infect flowers or developing fruit and do not show symptoms until weeks after when conditions are favourable. *Colletotrichum scovillei* can cause lesions on small, immature fruit as well as mature fruit. Fruit without any visible lesions (between 1-5 cm) were sampled from an infected field and found to be already infected with *C. scovillei*. Infected fruit can have one or more soft, sunken lesions covered with salmon-coloured spore masses (Figure 2).

Biology and spread

Colletotrichum species may overwinter on infected pepper fruit left in the field or on infected plant material at the end of the production season. Additionally, if crop debris remains on equipment or irrigation lines, this may serve as an overwintering source for the pathogen. Pepper anthracnose usually starts out as a 'hot spot' in the field and then fans out directionally with the prevailing wind and driving rain. The spores of *Colletotrichum* species are spread short distances through splashing water, rain, irrigation, driving winds and equipment/people. The spores are not spread long distances via wind. Hot weather along with

afternoon and evening showers are ideal conditions for anthracnose development.

Management

Cultural controls for anthracnose should include:

- Starting with clean transplants
- Scouting regularly and removing infected plants, including plants surrounding the diseased one, as soon as symptoms are seen
- Rotating away from peppers, ideally a three-year rotation, can help reduce inoculum pressure
- Avoiding the use of overhead irrigation can help reduce the leaf wetness period needed for infection
- Working in infected fields last to avoid spreading the disease to healthy fields
- Mulching/mowing down remaining plant debris after harvest and then incorporating into the soil as soon as possible to allow for the soil microorganisms to break down the residue
- Cleaning and disinfecting equipment including irrigation hoses, baskets, tractors, trucks, wagons, etc. before storage

Other management strategies could include host resistance. Based on a report from South Carolina, there are some varieties including 'Roulette,' 'Red Ember,' 'Aiji Rico' that show tolerance to the disease. None of these cultivars are suitable to Ontario production, however it does demonstrate that there may be some genetic resistance in commercial cultivars that could be incorporated into northern cultivars.

Fungicide applications targeting this new anthracnose need to start at flowering and continue on a seven-to-10-day interval until harvest. Make sure the sprayer is well calibrated and the fruit is receiving adequate coverage. Table 1 outlines the fungicides registered in Canada for pepper anthracnose.

Fungicides that contain a group 11 (Cabrio and Quadris Top) are heavily relied on for anthracnose control and there are many *Colletotrichum* species that infect horticulture crops that have become resistant to these fungicides. To maintain the use of these products, fungicide resistance management strategies need to be used.

In programs in which applications of group 11 are made with both solo products and mixtures, the number of group 11 containing applications should be no more than 50 per cent of the total number of fungicides applied per season. For example, if you are using 10 applications to control



Figure 1. Anthracnose caused by *Colletotrichum coccodes* and/or *C. dematium*.



Figure 2. Anthracnose caused by *Colletotrichum scovillei* on banana, bell, and jalapeño peppers.

Table 1. Fungicides registered on field peppers for the 2023 field season for anthracnose. Note that captan is an Emergency Use Label for the 2023 season.

Active ingredient(s)	Product(s)	FRAC Group	Maximum # of applications per year	Pre-Harvest Interval (days)	Expected efficacy (0=none, 3=excellent)
captan	Captan 80 WSP	M	3	3	3
pyraclostrobin	Cabrio	11	6	0	2-3
azoxystrobin + difenoconazole	Quadris Top	11 & 3	3 ¹	1	2-3
difenoconazole + pydiflumetofen	Miravis Duo	3 & 7	2 ¹	0	1-2
difenoconazole + benzovindiflupyr	Aprovia Top	3 & 7	4 ^{1,2}	1	3
benzovindiflupyr	Aprovia	7	4 ²	1	3
fludioxinil + cyprodinil	Switch Button	12 & 9	3	0	3

¹ only 4 applications of any difenoconazole containing product per year

² only 4 applications of any benzovindiflupyr containing product per year

anthracnose, a maximum of five applications containing a group 11 should be applied. Ideally, only 1/3 of the spray program should include a group 11 fungicide.

In 2022, Dr. Cheryl Trueman and Kevin Dufton from the University of Guelph conducted a fungicide efficacy trial on the Ridgetown campus with support from industry partners. All treatments started at flowering and continued on a seven-day schedule except for one program which continued on a 14-day interval. Jalapeño peppers

inoculated after the first fungicide application were harvested five times and assessed for anthracnose (% fruit with at least one lesion).

Figure 3 shows the efficacy of individual fungicides and three programs. Key learnings include: (i) multiple registered fungicides with different FRAC groups were effective on *Colletotrichum scovillei* including Cabrio (group 11), Aprovia (group 7) and Switch (group 9 and 12); (ii) Captan (group M) was effective and should be considered for ongoing management for disease control

and to reduce the risk of fungicide resistance in group 11 and 7 products - noting that this is currently an emergency use label; (iii) a program with Canadian fungicides was as effective as the positive standard of the U.S. program which relied heavily on chlorothalonil; (iv) it is important for fungicide applications to start at the flowering stage and continue on a seven-day schedule as the 14-day application program did not provide adequate control.

Continued on next page

ONTARIO VEGETABLE NEWS

New research leads to improved anthracnose management in peppers

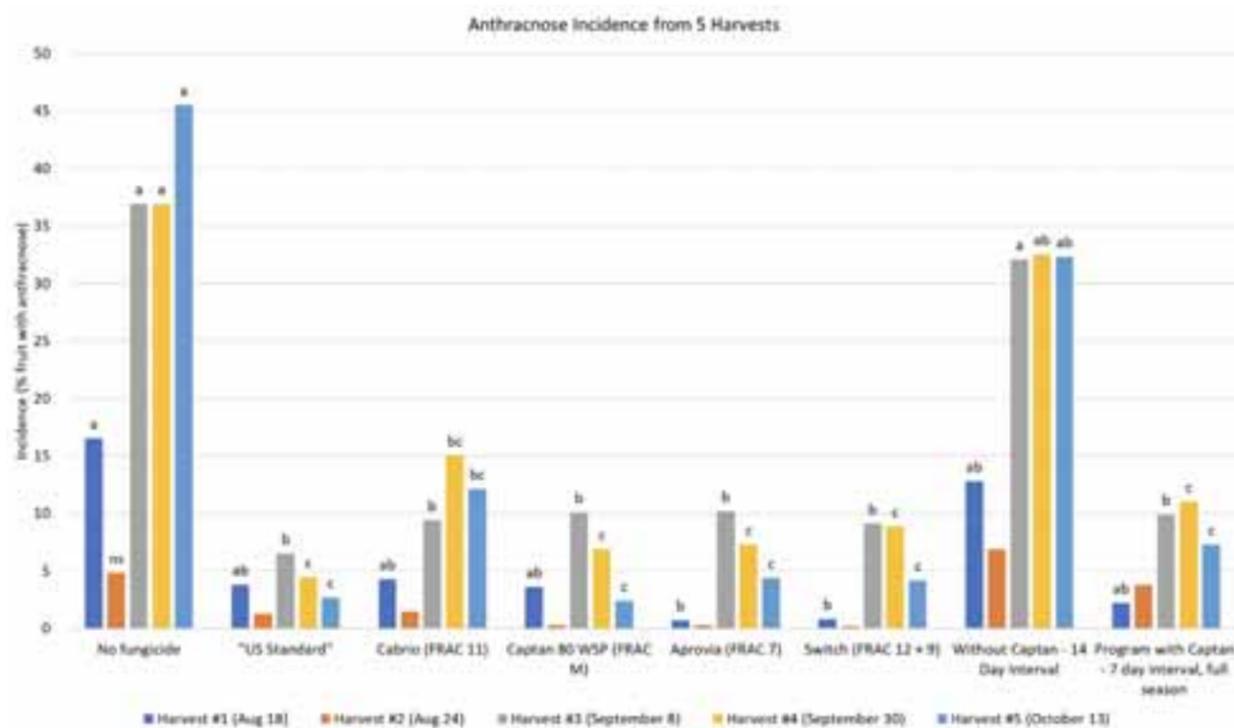


Figure 3. Average anthracnose incidence from 5 harvests from a pepper trial in Ridgetown, Ontario.

Week	Product (FRAC group)
1 (first flowering)	Quadris Top (11+3)
2	Switch/Button (12 + 9)
3	Captan (M) + Cabrio (11)
4	Aprovia (7) OR Aprovia Top (7+3)
5	Switch/Button (12 + 9)
6	Cabrio (11)
7	Aprovia (7) OR Aprovia Top (7+3)
8	Switch/Button (12 + 9)
9	Quadris Top (11 + 3)
10	Captan (M)
11	Aprovia (7)
12	Cabrio (11) + Captan (M)

Table 2. An example fungicide program for control of pepper anthracnose for the season. Fewer or more than 12 applications may be needed, depending on field history, variety, weather, etc. Always consult product labels before use.

Continued from page 14

Table 2 provides an example of a fungicide program based on the fungicide efficacy trial and should be used only as a reference for those managing this new anthracnose caused by *Colletotrichum* species. These fungicides are also effective on the other *Colletotrichum* species present in Ontario that may still cause disease on peppers.

Pepper growers should keep anthracnose top-of-mind as planning continues for the 2023

field season. Reach out to Amanda Tracey (amanda.tracey@ontario.ca) or Katie Goldenhar (katie.goldenhar@ontario.ca) for any questions or concerns regarding this disease.

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Amanda Tracey is an OMAFRA vegetable crop specialist with responsibility for tomato, pepper, eggplant, sugarbeet and table beets. Katie Goldenhar is OMAFRA plant pathologist – horticulture crops.

Ontario Garlic Grower Association to host field day



The Garlic Growers' Association of Ontario is hosting a field day Saturday, June 10th hosted by Felix Furmanek near Arthur, Ontario.

Equipment from multiple suppliers will be on display, along with products from fertilizer and pest control product suppliers. The agenda includes a tour of a new garlic curing and storage facility along with a cultivar trial. Agenda items include updates in tank mix policies, CanadaGAP, mechanization, weed control, Fusarium management as well as updates about the SPUD Unit's

clean seed program.

Registration starts at 10 am and the agenda starts at 10:30 am and goes until 3:30 pm. Lunch will be provided. The field day cost is \$35 for GGAO members, \$45 for non-members and is payable at the door by cash or cheque. Furmanek Farms is located at 8818 Wellington Road, Arthur, Ontario, and all are welcome to join, rain or shine.

Please register for the field day by going to www.garlicgrowersofontario.com or by calling 416-567-7323.

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GOVERNMENT NEWS

Funding opportunity for Ontario processors and growers who pack fruit

The Ontario Agri-Food Energy Cost Savings Initiative is designed to support competitiveness, profitability, growth and long-term sustainability of agri-food processors by implementing technologies and processes to increase energy efficiency in their operations. This cost-share initiative is intended to help agri-food processors lower their overall operational costs to be more competitive and sustainable. Funding from this initiative will be used to support projects that prioritize reducing greenhouse gas emissions by investing in new technology, equipment, as well as building or facility modifications to help achieve this goal.

Eligibility

To be eligible for the initiative you must be a processor in the agri-food sector undertaking activities that promote energy efficiency that result in the reduction of overall operational costs. Further details on eligibility and applications process can be found in the initiative guidelines.

The program defines eligible processors as:

A Person that is a business in the agri-food supply chain; a slaughterhouse/abattoir; agri-food-processor (such as food, beverage); bio-processing company (such as food, industrial); packing house (such as washing, packing, chopping or other changes to product); pet food and fertilizer manufacturer; food/agricultural commodity/bioprocessor waste company;

excluding commissary (such as ready to eat counter), brewpub, brand owners.

Funding Level

A Recipient is eligible to receive 20% of Eligible Costs up to a maximum of \$300,000 in funding per Project under the Initiative.

Application period

Applications will be accepted until June 5, 2023.

Eligible activities

The following activities are eligible under the Initiative:

a. purchase or modification of equipment and technology that improve energy

- efficiency
- b. purchase or modification of water use equipment and technology that improve energy efficiency
- c. purchase of energy monitoring controls and equipment and technology
- d. building envelope energy efficiency improvements including:
 - i. renewable energy
 - ii. lighting
 - iii. ventilation
 - iv. heating
 - v. refrigeration
 - vi. water heating and cooling

More information, including program guidelines and application forms can be found at: www.ontario.ca/page/agri-food-energy-cost-savings-initiative.

Bill C-280 passed at Second Reading, a major win for the produce industry

The Fruit and Vegetable Growers of Canada (FVGC), the Canadian Produce Marketing Association (CPMA) and the Fruit and Vegetable Dispute Resolution Corporation (DRC) are thrilled to announce that Bill C-280, the Financial Protection for Fresh Fruit and Vegetable Farmers Act, has been passed at Second Reading in the House of Commons. This significant milestone, reached May 17, marks a crucial step forward in ensuring the financial security of the fruit and vegetable sector.

Bill C-280, championed by Member of Parliament (MP) Scot Davidson, aims to establish a

deemed trust, a vital financial protection mechanism for fresh produce sellers in Canada. This mechanism will help secure payment in the event of buyer bankruptcy, providing stability and support to the industry while safeguarding Canadian food security.

“The successful passage of Bill C-280 at Second Reading is an extraordinary milestone, and we wholeheartedly express our appreciation to MP Scot Davidson for his commitment in propelling this legislation forward,” expressed Rebecca Lee, executive director of FVGC. “For more than three decades, the

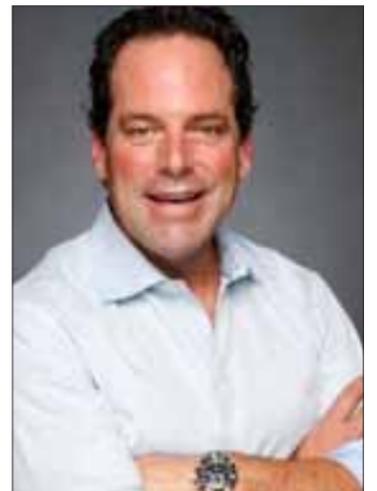
fresh produce sector has tirelessly advocated for the implementation of a financial protection mechanism. Today, we find ourselves closer than ever to realizing our long-standing goal. This achievement marks a significant leap towards ensuring the security and prosperity of our industry.”

The deemed trust proposed by Bill C-280 mirrors the successful model employed in the United States. It presents a financially feasible solution that imposes no additional burden on the government. By establishing this trust, fresh produce sellers can continue to contribute to local

economies across the country, while providing Canadians with safe and nutritious fruit and vegetable products.

The perishable nature of fresh produce, coupled with common industry payment terms, leave sellers unable to recover losses when faced with buyer bankruptcy. The recent case of Lakeside Produce in Leamington, Ontario, serves as a reminder of the urgent need for a financial protection tool to safeguard this essential sector and uphold food security in Canada.

To learn more, please visit www.protectproducesales.ca.



Legislation aims to exempt specific farming practices from carbon tax

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Bill C-234, which aims to exempt specific farming practices and associated fuels from the carbon tax, has passed Third Reading in the House of Commons and will proceed to the Senate.

Although the carbon tax’s primary objective is to reduce emissions, growers and farmers face a lack of practical options to reduce their emissions from fuel or machinery. This makes the carbon tax a financial burden without resulting in any reduction in emissions.

Growers pay a carbon price on essential farming activities such as irrigation, and maintaining

appropriate temperatures of greenhouses, among other activities. Bill C-234 would provide an exemption, limited to on-farm fuel use for these necessary farm practices, allowing farmers to invest their money instead in the efficiency of their operations.

Bill C-234 will now go before the Senate where it will be debated and voted on.

You can learn more here: <https://agcarbonalliance.ca/vote-for-bill-c-234/>.

Source: Fruit & Vegetable Growers of Canada May 15, 2023 hort shorts

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CROP PROTECTION

Results from the National Pest Management Priority Setting Exercise



JOSH MOSIONDZ

Following a three-year virtual hiatus due to the COVID-19 global pandemic, Agriculture and Agri-Food Canada's Pest Management Centre (AAFC-PMC) held its 21st annual national pest management priority setting workshop in a much-anticipated return to an in-person format in Gatineau, Quebec from March 21 – 23. The exercise was broken into three workshops, one per day, focusing on entomology, pathology and weed science over the course of the three days.

The meetings brought together a wide range of participants from across Canada, the United States, and other international partners including Brazil and the Netherlands. Participants included university and federal researchers, crop extension specialists, private consultants, provincial specialists, provincial minor use coordinators (PMUCs), registrant representatives, Pest Management Regulatory Agency (PMRA) and AAFC-PMC staff, growers and grower organization representatives.

The meetings were held to review the top priorities identified by each of the provinces' horticultural and ornamental crop industries to establish the top national priorities for the minor crops sector. Priorities which were selected in the final 'A' round will guide AAFC-PMC's field research program as research projects in the 2024 season and eventually support future minor use label expansion submissions sent to PMRA once complete. The goal of the workshops was to elevate 35 'A' priorities for capacity analysis consideration – eight mainstream and two organic projects per discipline, plus five regional

Table 1: Selected 'A' priorities for the 2023 workshop. Lines that are bolded will move forward as PMC projects in 2024 while those that are italicized were chosen as an 'A' priority but will not move forward at this time.

CROP	PEST(S)	PRODUCT SOLUTION	ACTIVE INGREDIENT SOLUTION	REGISTRANT
WEED SCIENCE PROJECTS				
Sweet Potato	Grassy Weeds	Arrow	clethodim	ADAMA
Pepper (field)	Broadleaf Weeds	Prowl H2O	pendimethalin	BASF
Strawberry	Grassy Weeds	Arrow	clethodim	ADAMA
Cranberry	Weeds	Elevore	halauxifen	Corteva
Field Conifers (incl. Christmas Trees)	Broadleaf Weeds	Starane	fluroxypyr	Corteva
Raspberry	Broadleaf Weeds	Lontrel	clopyralid	Corteva
Cucumber (field)	Grassy Weeds	Prowl H2O	pendimethalin	BASF
ENTOMOLOGY PRIORITIES				
Rutabaga	Flea Beetles	Sivanto Prime	Flupyradifurone	Bayer
Hemp, industrial	Cutworms	Pounce	Permethrin	FMC
Nectarine	Plum Curculio	NoVil	Metarhizium robertsii isolate CPD6	Crop Defenders
Hazelnut	Filbert Bud	Mite	Magister Fenazaquin	Gowan
Kalettes	Aphids	Exirel	Cyantraniliprole	FMC
Ornamentals (Greenhouse)	Aphids	A20262B / Elestal Neo	Spiropidion	Syngenta
PATHOLOGY PROJECTS				
Carrot	Cercospora Leaf Spot	Captan 80 WSP	captan	ADAMA
Cucumber (Greenhouse)	Powdery Mildew	Kinoprol 20SC	ipflufenquin	Nippon Soda Co. Ltd.
Honeysuckle, edible (Haskap)	Powdery Mildew	Gatten	flutianil	OAT Agrio Co. Ltd.
Strawberry	Neopestalotiopsis fruit rot	Allegro	fluazinam	ISK Biosciences
Strawberry (Greenhouse)	Powdery Mildew	Property	pyriofenone	Syngenta
Hops	Diapotha Leaf and Cone Blight	Folpan	folpet	ADAMA
Tomato (Greenhouse)	Botrytis grey mould	Kinoprol	ipflufenquin	Nippon Soda Co. Ltd
Fescue (established for seed and forage)	Stem and leaf spot complex	Veltyrna	pyraclostrobin + mefentrifluconazole	BASF
REGIONAL UPGRADE PROJECTS				
Greenhouse Ornamentals (MARITIMES)	Powdery Mildew	Adavelt	florylpicoxamid	Corteva
Rutabaga (QUEBEC)	Cabbage Maggot	Delegate	spinetoram	Corteva
Ginseng (ONTARIO)	Debudding	Ethrel	ethephon	Bayer
Dill, Seeds (including Caraway and Coriander) (PRAIRIES)	Labelled Weeds	Lorox L	linuron	Tessenderlo Kerley Inc.
Caneberries (Greenhouse)	Cane Botrytis	Fontelis	penthiopyrad	Corteva
ORGANIC PRIORITIES				
Basil (field)	Bacterial Blight	Kocide 2000-O OR 3000-O (pending registrant input)	copper hydroxide	Cosaco
Grape, wine	Spotted Lanternfly	Biotitan	Beauveria Bassiana ANT-03	Anatis Bioprotection
Cranberry	Blackheaded Fireworm	Madex HP	Baculovirus	Andermatt

selections at the end of the workshops.

The opening day of the workshop was focused on entomology, and began with

participant introductions, welcoming remarks from PMC staff and executive director Marcos Alvarez, and featured a moment of tribute where

colleagues past and present came together to remember the memory of the late Gavin Graham, former provincial weed management specialist and

PMUC for New Brunswick.

Continued on next page



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CROP PROTECTION

Results from the National Pest Management Priority Setting Exercise

Continued from page 18

The workshops commenced following a short break, and by end of day, resulted in the selection of six mainstream priorities, two below the day's target of eight priorities, and two organic priorities for capacity consideration.

Day two focused on pathology and began with similar introductions, then featured a PMRA update and question period with acting executive director Frédéric Bissonnette. The priority setting process began, and then had a break between sessions just before lunch to celebrate 20 years of partnership between AAFC-PMC and stakeholders. The break featured an address from AAFC associate deputy minister Suzy McDonald highlighting many of the key accomplishments of the organization in the past 20 years.

The workshop resumed after the lunch hour, then concluded with a full eight mainstream priorities being chosen, along with one organic priority for later capacity consideration.

Finally, the last day of the workshop was focused upon weed science, beginning with opening remarks and introductions, and a thank-you session recognizing the

contributions of Ian Gardiner, longtime submissions manager for AAFC-PMC who is retiring later this year following more than 22 years of public service. The workshop itself moved quickly, with seven mainstream priorities being chosen, and selection of the five regional upgrades occurring all before the scheduled lunch break, marking conclusion of the 2023 workshops far ahead of schedule.

Continuing from last year, the capacity analysis process first introduced in the 2022 Priority Setting Workshops occurred throughout the month of April following the end of this year's meetings. This process was implemented to ensure projects are completed in an efficient, and timely process in the coming years according to several factors including: staffing resources, funding, and the number of ongoing projects already underway for a particular crop, crop availability in residue crop zones across Canada, whether a selection would support a crop group registration, selected solution product availability, selected pest pressure, registrant support conditions, new, invasive, or emerging pest status, whether or not the priority was selected as an 'A' priority but not taken on in 2022, and 'category A' new use project statuses.

Following this capacity analysis process, a total of 18 projects were intended to remain as final picks broken into 11 mainstream projects, two organics, and the five regional upgrades. Attendees were able to narrow their selections below the elevations target with a total of 29 projects being raised to an 'A' following careful discussion and negotiation, thus resulting in fewer projects needing to be analyzed. However, following discussions during the capacity analysis process between PMUCs, AAFC-PMC, and PMRA staff, several efficiencies within the projects selected this year were found and three additional projects were selected by AAFC-PMC for a total of 21 projects going forward for research. This marks 13 mainstream selections, five regional upgrades, and two organics projects being committed to by AAFC-PMC. A further seven projects are expected to be selected as joint projects between the U.S. IR-4 project and AAFC-PMC at the IR-4 workshops scheduled for September and October 2023 including a piloted process of selecting one environmental horticulture program to partner on, in addition to six food uses.

Thus far, AAFC-PMC has committed to returning to a virtual selection process in winter 2024 in an effort to preserve

programming funds while targeting a return to another in-person meeting in winter 2025. Project capacity for 2024 is expected to be confirmed closer to the meetings in late fall or winter 2023–2024.

The attached table summarizes the projects agreed upon as 'A' priorities for the 2023 workshop. Lines which are bolded indicate projects which will move forward as AAFC-PMC projects in 2024. Lines which are italicized were not selected as part of the piloted capacity analysis process; certain projects not selected may still be elevated as a 2024 project if the project aligns with those set at the IR-4 selection OR if AAFC-PMC cannot find six projects which align with Canadian growers' needs during the workshop.

Ideally, the projects selected this year will have their data requirements completed and submitted to the PMRA by AAFC-PMC with a target of submission by 2028. Subsequent registration decisions for these submissions are expected from PMRA one to two years following submittal.

Josh Mosiondz is OMAFRA minor use coordinator.

Captan receives emergency use registration in Ontario field peppers

Ontario pepper growers will have a new weapon in their arsenal to control strains of anthracnose in their fields in 2023. ADAMA Canada has obtained an emergency registration for Captan 80 WSP, a fungicide that has proven effective in managing Anthracnose including the new Colletotrichum Scovilei strain.

"We know that Anthracnose can devastate a pepper crop and the new Colletotrichum Scovilei strain has proven to be even more aggressive," said Drew Thompson, area business manager for Ontario for ADAMA Canada. "We're pleased to see the emergency registration granted in time for the 2023 crop year."

According to the Ontario

Ministry of Agriculture, Food and Rural Affairs (OMAFRA) the Colletotrichum Scovilei strain is particularly worrisome because it led to more than 80 per cent of fruit in infected fields showing at least one lesion by late August.

Captan is a water-dispersible granule sealed within individual water-soluble pouches. The pouches and pesticides will dissolve readily in water for use as a spray. It is a Group M4 fungicide which is unique in that it currently has no known resistance. OMAFRA recommends applying Captan a maximum of three times per year along side other fungicides as part of a complete program.

"Captan is a great illustration of our product innovation as well as our commitment to respond

quickly to the needs of Canadian farmers," said Rob Bahry, research and development manager for ADAMA Canada. "We encourage growers to reach out to their retailers or ag extension specialists to discuss the use of Captan this season."

ADAMA Canada asked the Pest Management Regulatory Agency for permission to register Captan as an emergency use. This is an extension of the 2022 emergency use for the same product. For more information, including the new label with recommended uses, visit the product page: <https://bit.ly/3VdJhdN>

Source: ADAMA Canada April 25, 2023 news release



Anthracnose damage in field peppers.

Resistant weed testing is available for the 2023 field season

KRISTEN OBEID

Resistant weeds are becoming the new norm in weed management for many Ontario farmers. This is a reminder that genomic resistant weed testing will be available again at no cost to the grower due to funding from the Fresh Vegetable Growers of Ontario, the Ontario Processing Vegetable Growers, Bayer Crop Science Canada, and Syngenta Canada Inc. It is important to get suspected resistant weeds tested on a field-by-field basis. This ensures that you have a resistance profile for each field.

There are now 26 different genetic tests available to Ontario growers, plus two species differentiation tests. The Amaranthus species differentiation test has been instrumental in identifying waterhemp and hybrids of waterhemp with other pigweed species.

In Ontario there are 22 different herbicide-resistant weed species. The common trend is that there are more

species that are multiple herbicide-resistant, or resistant to more than one herbicide group. Of particular concern is waterhemp that has been found to be five-way resistant to herbicide groups 2 (Prism, Pinnacle, Pursuit), 5 (Lorox, Gesagard, Sencor, Sinbar), 9 (glyphosate), 14 (Authority, Chateau, Eragon, Valtera) and 27 (Armezon, Callisto, Laudis, Shieldex) in seven counties in Ontario – Chatham-Kent, Elgin, Essex, Lambton, Middlesex, Northumberland and Stormont/Dundas/ Glengarry. This brings the total counties with herbicide-resistant waterhemp in Ontario to 18. Waterhemp is no longer just a field crop problem, it has also been found in several horticulture crops – asparagus, peppers and sweet corn.

With genetic testing we do not have to wait for the weeds to go to seed, we just need a piece of leaf tissue about the size of a quarter from 10 different plants in the field. So as soon as you notice your herbicide not working, take the samples. This can occur right after planting or anytime throughout the growing season.

Why is it so important to get your weeds tested? It's

simple. The number and distribution of herbicide-resistant weeds in Canada is increasing rapidly in all crops and the cases of multiple herbicide resistance are becoming the new norm. These tests can be completed in under two weeks. Having diagnostic tests available to quickly confirm the presence of herbicide-resistant weeds will improve the timeliness of management and prevent their spread which will increase the lifetime of current herbicides for as long as possible.

Our only defense against herbicide-resistant weed species is to scout for and test suspected populations as soon as possible.

To obtain sample collection kits and protocols please contact: Kristen Obeid, OMAFRA weed management specialist for horticulture crops on twitter @WeedProfesh, by email: kristen.obeid@ontario.ca or text or cell 519-965-0107.

Kristen Obeid is OMAFRA weed management specialist.

Optimize Fruit Bulking with “Science Driven Nutrition”™



Growers have four main windows of opportunity to maximize their harvest as the apple crop's nutritional needs change through the season. Apple bulking, when fruit cells expand and the apple increases in size and weight, is an important opportunity to impact fruit development. Growers who use Science-Driven Nutrition™ to better understand their apple crop can support optimal growth and an enhanced marketable yield.

A proper nutrition plan ensures cohesiveness throughout the growing season. Bulking is the period of time when growers must focus on facilitating the production and movement of sugars into the cell structures. During cell division, the crop timing prior to the fruit bulking window, growers increased calcium applications to support fruit cell development and fruit firmness. When this opportunity to introduce calcium into the fruit ends four-to-six weeks post petal fall, maintenance applications using products like Agro-K's **Vigor Cal™** or **Calcium 7%**, are required to support tree growth and fruit firmness.

In addition to supplemental calcium, the apple tree requires an increased amount of energy to support the rapid leaf expansion and shoot growth that occurs at this time. Agro-K's **AgroBest 9-24-3** is an excellent source of phosphorous, which is a key nutrient behind the energy driving healthy cell development. Zinc assists with the leaf and vascular tissue development on the new growth, while magnesium, manganese, sulfur and iron synergize to maximize chlorophyll production and photosynthesis. Agro-K's **Zinc Plus +5** is a great example of foliar products containing multiple micro nutrients designed to support leaf development and function during fruit bulking.

Potassium, which helps to move sugars throughout the plant and regulates plant moisture through the opening and closing of the stomata, is one of the most important nutrients during this time. The apple crop's potassium needs increase exponentially during the summer months. Fruit color, weight and uniform maturity at harvest all hinge on maintaining proper potassium levels during cell bulking with products like Agro-K's **KDL** and **Potassium 0-0-6**. Excessive nitrogen, an inhibitor to fruit color, must also be avoided during this crop window.



Science-Driven Nutrition™ was developed to help growers manage the apple's diverse and complex nutritional needs by following the **Agro-K's Five R's**: The Right nutrient applied at the Right time in the Right form in the Right mix targeting the Right location in the plant. This approach maximizes effectiveness and minimizes fertilizer waste.

During apple bulking, Agro-K's soft foliar products ensure producers don't inadvertently create fruit lenticel cell damage, a problem that inevitably worsens over time. Agro-K's **Vigor** and **Dextro-Lac** product lines are designed to safely improve crop performance by enhancing nutrient uptake and utilization. Using soil testing, sap analysis, fruit sampling and other tools, growers determine which products will be most helpful for their unique orchard.

For more information on using Science-Driven Nutrition™ to help your crop flourish throughout the season, visit www.agro-k.com.

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