

COLD CHAIN TECHNOLOGY

Cold comfort, the new standard in root vegetable storage



For potatoes and root vegetables, cold chain technology is improving. It took years of research in Europe but when John and Cristina Hambly, Gwillimdale Farms, committed to new storage facilities, the proof has been in better quality produce from their 1,200 acres of vegetables. Here, sales and plant operations manager Quinton Woods oversees the second phase of a storage facility near Bradford, Ontario that will be filled with onions and carrots in the fall of 2019. Photos by Glenn Lowson.

KAREN DAVIDSON

Fruit Logistica, Agritechnica, Interpom. The names roll off the tongue of Quinton Woods as if they were coffee shops down the road. In fact, they are globally recognized trade shows. The first two are in Germany and the last one is in Belgium.

As Canadian growers scout Europe for a competitive edge, these hubs have grown immeasurably as connectors to horticultural technology. John and Cristina Hambly, owners of Gwillimdale Farms, Bradford, Ontario and their sales and plant operations manager, Quinton Woods, have travelled to Europe six times since 2011 to settle on new storage

equipment.

These trade shows were the first window to several cooling systems, before travelling into the countryside to see storage facilities. Their quest took them to the northern town of Hardifort, France, not far from the Belgian border. That's where Klim'Top Controls has its headquarters for harvesting and post-harvest equipment for box and bulk storage. The promotional literature promising improved pack-outs of produce has proven to be very accurate, says Woods.

"We had the first unit in North America in 2018 for carrots and potatoes," says Woods. "There's always some skepticism in believing the sales pitch, but after one year of experience, we can say that our potatoes came out

with whiter colours in the spring of 2019. Packouts were increased by 15 per cent. We also saved tons of money in electricity costs. We are at 35 to 40 per cent of the electricity costs paid the year before."

Those savings have spurred the second phase of storage facilities, 42,000 square feet, to be constructed in time for onion and carrot harvest in September 2019. When complete, the side-by-side storages will hold 18,000 pallet boxes in a total of 87,000 square feet. The expectation is to cure onions faster and to store them longer into the spring season. The ability to store into June – and even July -- can reap dividends when selling to buyers who are short of local product before transitioning into new crop.

How do Klim'Tops Controls work?

In traditional storages, air is pushed through vegetable boxes. Condensers are on the ceilings. Air takes the path of least resistance, so it's very hard – and expensive -- to push cold air to the bottom of the pile to a set point for overwinter storage.

The Klim'Tops Controls system is built on the concept of pulling air through the pile. As Eric Clopaert, sales representative for Klim'Tops Controls explains, the system can pull in fresh cold air in the wintertime – free cooling – while maintaining a constant humidity rate in the storage.

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Prairie potato boom PG 5

Leek moth trials PG 6

Greenhouse innovation PG 12

AT PRESS TIME...

Mucci Farms acquires Orangeline Farms

The highly competitive greenhouse vegetable industry is witnessing consolidation with the August 21 announcement that Kingsville-Ontario based Mucci Farms has acquired controlling interest of Leamington-Ontario based Orangeline Farms. The deal includes 32 acres of greenhouses, a warehouse and 100 acres of land for future expansion.

"It's an exciting time for the company as we continue our aggressive expansion plans to increase our local and regional production," says Bert Mucci, CEO. "Consumers are demanding more local production, and we're listening. We also have plans in place to build on the additional land that was received as part of the agreement."

Founded in 2000 by the Kniaziew family, Orangeline Farms is an award-winning grower predominantly known for its unique pepper offerings grown under the Zing! Healthy Foods brand.

"In searching for growth opportunities for both Orangeline's staff and our ever loyal customers, the chance to partner with a world class organization like Mucci Farms was an easy decision to make," said Duffy Kniaziew, founder.

Mucci Farms will continue to use the Zing! brand for the foreseeable future.

In other news, Mucci Farms is



Orangeline Farms, Leamington, Ontario

expanding its footprint in Huron, Ohio. What started as a 60-acre project will be expanded to 75 acres with the purchase of more land. "The first 24-acre phase is in its second season of harvesting, and we'll be building two more identical ranges. Phase two construction is already underway," remarked Bert Mucci.

Mucci Farms is a vertically integrated fruit and vegetable grower that owns and operates 250 acres of tomato, pepper, cucumber, lettuce and strawberry greenhouses in Canada and the United States, with a partner-grower network of 1500 acres across North America. The organization makes sizeable investments in automation and technology. These investments include a significant acreage of grow lights that allow the company to grow locally 365 days per year, with an end goal of equipping 100 per cent of its hi-tech glass facilities with High Pressure Sodium and/or LED lights.

CanAgPlus AGM in Charlottetown

Starting in 2019, the annual general meeting for CanAgPlus, the not-for-profit corporation that owns and operates the CanadaGAP Program, will be held in different regions of the country to improve participation and facilitate engagement by members. The 2019 Annual General Meeting will be held in Charlottetown, PEI on Thursday, November 28 at 2:00 p.m. ADT, at the Red Shores Racetrack & Casino.

A town hall interactive session with members in attendance is scheduled to follow the AGM, says Heather Gale, executive director. Members will have the opportunity to ask questions and engage in an open discussion with CanadaGAP.

Members are invited to join the board of directors for dinner following the AGM, generously sponsored by Syngenta. The dinner starts at 6:00 p.m. at the Top of the Park restaurant.

Attendees must register for the AGM by October 14. For details, go here: www.canadagap.ca/events/annual-general-meeting/

NEWSMAKERS

The **Morris Gervais family**, a fruit and vegetable farm near Springwater, Ontario, is generously hosting Breakfast on the Farm for Farm & Food Care Ontario on September 14, 2019. The free event regularly attracts 2,000 visitors from 9 am to 1 pm. For a preview of the farm, get a ticket or to volunteer, go to: www.farmfoodcareon.org/botf-sept2019/

British Columbia's wine industry is mourning the unexpected passing of **Harry McWatters**, 74, a pioneer who witnessed 50 vintages in his career. He died in Summerland on July 23, about a year after his newest venture, Time Winery, opened in Penticton. He is best known for founding Sumac Ridge and See Ya Later wineries.



Quebec's greenhouse industry is saddened with the confirmation that **Stéphane Roy**, the president of the tomato growing company Savoura, and his teenage son **Justin** did not survive a helicopter crash. The wreckage and their bodies were found on July 25 after they went missing from a fishing trip on July 10. Roy founded Nouvelles Serres in 1995 and later, acquired the Serres Sagami, Saguenay, in 2000. In the field of greenhouse, organic and soft fruit production the 26-hectare company became one of the forerunners of the industry.

On July 3, a provincial court judge found Skye View Farms and **Alex and Logan Docherty**, Elmwood, Prince Edward Island, not guilty of charges laid against them under the federal Fisheries Act related to a fishkill in 2016. The judge ruled that fisheries officials failed to get a search warrant when they went on their property. The incident was related to torrential rains that fell on their farm when a storm cell stalled over their property. The Crown has filed a notice of appeal which will extend legal bills for months to come. "The PEI Potato Board and the provincial federation of agriculture continue to advocate for changes to the approach and to the regulations, which seem to have been designed for industrial polluters, rather than for farms and farmers," reports the PEI Potato News.

Jessica MacKinnon has accepted the position of acting manager, horticulture crops for OMAFRA as of August 12. She can be reached at 519-830-6507 or by email jessica.mackinnon@ontario.ca.

Valerie Gilvesy, Tillsonburg, has been appointed vice-chair of the Ontario Farm Products Marketing Commission for a three-year term. She has been a board member since 2016.

Best wishes to **Chris Duyvelshoff**, crop protection advisor, Ontario Fruit and Vegetable Growers' Association, as he is one of 21 emerging leaders to embark on the 19-month course for Advanced Agricultural Leadership Program. Class 18 starts September 15-19. He will be immersed in study tours that include understanding Canadian/American relations; understanding the federal government, globalization and trade; understanding intercultural communications and cultural intelligence.

The Quebec Produce Marketing Association has honoured **George Pitsikoulis**, president Canadawide Inc., with its 2019 Pillar of the Industry award. He and his brothers Nick and Michael operate the wholesale produce business based in Montreal, servicing Quebec, Ontario and the Maritimes.

Kudos to **Paul Moyer** and his company Clēan Works which recently received the Food Safety Innovation Award from the International Association for Food Protection. From his base near Niagara Falls, his new technology maintains the cold chain using a patented batch-ozone process that makes grapes, citrus, tender fruit, berries, melons and leafy greens safe to eat.

Condolences to the family and friends of **Ken Hincks**, founder of Wellington Produce Packaging (formerly Wellington Wood Products) at Mount Forest, Ontario. He passed on July 26, 2019 in his 85th year. He was well-known as a provider of packaging solutions to the horticultural industry. The company has been in existence for more than 80 years, with a satellite office in Leamington.













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COVER STORY

Cold comfort, the new standard in root vegetable storage



Quinton Woods (left) and Murray Jelly, farm manager for Gwillimdale Farms, inspect a field of transplanted onions at Bradford, Ontario as construction of new storage space proceeds in the background.



Murray Jelly (L) and Quinton Woods project volumes for the fall harvest in this new storage space cooled by French company, Klim'Top Controls.



Murray Jelly looks forward to using the new European-style bins manufactured by Polish company, Interagra. They will hold more volume of vegetables, thereby reducing the number of times bins have to be moved. He will use chalk paint on the non-metal board to indicate the origin of the field.

Continued from page 1

The system is fitted with the latest generation of electrically commutated motors (EC), making it possible to select different ways to pull down the temperature. The system contains hydrofluoro-olefin (HFO) fluid, a more environmentally friendly alternative that has low global warming potential.

One of the features is that the energy-saving option takes into account different electricity rates within the day and operates at the most efficient time. An Internet connection with the Klimweb system means that the owners can check on real-time temperatures and electricity consumption from any computer or smartphone.

European-style storage boxes will be more efficient

In other storage efficiencies, Quinton says that “Euro” bins will be used for the first time this fall to minimize movement of produce. Made of both hardwood and softwood, these bins weigh less than conventional bins, but have twice the holding capacity at 1.6 metres x 1.2 metres x 1.2 metres.

“With existing boxes, we staple a sticker to every box for traceability, but with Interagra


boxes, we can use chalk paint on the designated, non-metal chalkboard,” says Woods. “Again, we evaluated bins of all sizes at various shows in Europe and decided on this Polish company.

According to the company’s website (www.interagra.com), the boxes are expected to have a lifespan of 15 years or more.



As growers continue to invest in environmentally-friendly cooling systems, they also gain other rewards in paying less on electricity bills, and hence less carbon tax. Gwillimdale Farms is a timely example of how Ontario growers are paying carbon tax while also shouldering the load of securing financing for new technology.

The Grower goes “Behind the Scenes” of this cover story to interview Quinton Woods, Gwillimdale Farms, at Bradford, Ontario. State-of-the-art cooling technology for root vegetables has benefits of better quality produce and lower electricity bills. To listen, visit www.thegrower.org/podcasts.









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CROSS COUNTRY DIGEST

BRITISH COLUMBIA

Rain cracks the cherry crop

It's been a very poor season for cherries says Pinder Dhaliwal, president of the BC Fruit Growers' Association. A colder than usual February resulted in some winterkill, then a spring frost at minus 3°C further damaged blooms. The third blow was unseasonable rain in early July which caused cherries to split.

"Losses were anywhere from 30 to 50 per cent of the cherry crop depending on location and slope in the Okanagan Valley," says Dhaliwal. "There were 40 per cent splits in the Skeena

variety. If that variety smells rain, it splits."

If growers can afford the \$1,000 per hour costs, helicopters are contracted to blow off rain. Or cherry blowers are hitched to the back of tractors which go up and down orchard aisles. However, as Dhaliwal points out, a 70 hp tractor is the minimum needed. And decisions to invest in mitigating the effects of rain are difficult.

"If you've invested in one round of helicopters, do you go again in two days' time," says Dhaliwal. "Back to back rain

events hurt."

Later-maturing cherry varieties – Sentennial and Staccato – are now being harvested in August through to September. There will be fewer B.C. cherry exports this year as a result of climatic conditions – a disappointment given that the Japanese market had just opened in 2019.

"Overall, it's been a cooler summer," says Dhaliwal. "We had only two days in July that went above 30°C."



PRINCE EDWARD ISLAND

Blueberry company to expand markets

Jasper Wyman & Son Canada Inc, known for its processing of wild blueberries, will receive more than \$971,000 in funding under the Canadian Agricultural Partnership, AgriInnovate Program.

An additional repayable contribution of \$500,000 from the Atlantic Canada Opportunity Agency's Business Development Program was announced July 26.

This funding will be used to install new equipment to more efficiently and precisely sort produce, while removing up to 99 per cent of defective berries. The project will help the

company grow exports and sales, increase processing capacity, reduce water and energy consumption and hire additional staff.

The Government of Prince Edward Island will provide a \$194,000 grant through Innovation PEI to assist with the project.

"Our primary producers are the engine that drives the Prince Edward Island economy and Jasper Wyman & Son are one of the anchors of our blueberry industry," said Matthew MacKay, PEI minister of economic growth, tourism and culture. "They provide a



Photo caption: L-R , Wyman and Son VP and CFO Robert Marconi; Minister of Veterans Affairs Canada Lawrence MacAulay; PEI Minister of Agriculture Bloyce Thompson; and Wyman and Son President and CEO Anthony Shurman.

major boost to the local economy and important employment for the region. This project will put the company on the cutting edge of sorting technology and will improve efficiency for the operation."

In 2018 blueberries were

Canada's most valuable fruit export making up 58 per cent of total fruit exports with a farm gate value of more than \$243 million.

Jasper Wyman & Son Canada Inc., including its parent company, makes up the second

largest supplier of wild blueberries in the world. The company farms approximately 1,200 acres of wild blueberries in Canada.

Source: Agriculture and Agri-Food Canada July 26, 2019 news release

NOVA SCOTIA

Ocean Crisp Apple Company to install robotic equipment

Ocean Crisp Apple Company Inc., established in June 2017 with packing, juice/cider, and storage facilities in Kentville and Windsor, Nova Scotia, is advancing its operations with almost \$2.5 million in federal funding. The company is one of the largest single suppliers of premium variety apples in Nova Scotia.

An investment of \$1,978,157, is being provided under the Canadian Agricultural

Partnership, AgriInnovate Program. There is an additional contribution of \$500,000 from Atlantic Canada Opportunities Agency's (ACOA) Regional Economic Growth through Innovation (REGI) program.

The company, helmed by president Blake Sarsfield, will install first-in-Canada automated and robotic equipment that will increase capacity, improve efficiency and quality, and reduce water usage. Other



major Atlantic apple producers will benefit by being granted access to the advanced equipment, which will support the province in sending premium apple varieties, such as Honeycrisp, to high-value

export markets.

In 2017, the farm-gate value for apples in the Maritimes reached \$24.7 million, an increase of \$9.2 million from 2011 due to the success of high value cultivars such as

Honeycrisp and Ambrosia apples.

Source: Agriculture and Agri-Food Canada August 12, 2019 news release

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CROSS COUNTRY DIGEST

\$820 million of prairie potato plant expansions come on stream

KAREN DAVIDSON

A new chapter will be book-marked with hopes that the fall 2019 potato harvest meets demands of two new processing plants on the prairies. Investments total \$820 million in Manitoba and Alberta.

In Portage la Prairie, Manitoba, the J.R. Simplot plant expansion of \$460 million is on target for January 2020 says Dan Sawatzky, general manager, Keystone Potato Producers' Association.

Processing contracts increased in Manitoba from 46,846 acres in 2018 to 52,351 acres in 2019 to service the plant. The bulk of that increase was in the Assinboine-aquifer region encompassing Glenboro, Carberry and Shilo. With a timely rain in mid-August, the Manitoba potato crop is expected to achieve yields of 340 cwt/acre. When tablestock and chipping potatoes are included, Sawatzky says total acreage is nudging 70,000 acres.

Manitoba seed growers opted not to expand due to limited capacity in capital and land base. Processing seed acreage remains stable at 3,025 acres.

While several new potato storages were built in Manitoba in 2018, investment has not occurred at the same rate in 2019. The tough harvesting conditions of 2018 resulted in 5,200 acres frozen in the ground and another 4,000 acres of potatoes lost in storage.

"It's very tough to rebound with the loss of millions of dollars," says Sawatzky. "Margins are thin. Growers haven't been able to move ahead as expected to take advantage of the new plant expansion."

In Lethbridge, Alberta, growers are set to deliver potatoes to McCain and Lamb-Weston plants as well as the newly operational \$360 million Cavendish plant that's equipped with state-of-the-art equipment. A TOMRA Eco Steam Peeler is one example.

Alberta's potato growers have confidently increased from 53,500 acres in 2018 to 62,000 acres in 2019 reports Terence Hochstein, executive director, Potato Growers of Alberta. Of that total, 12,400 acres are in seed, 3,700 acres are in tablestock and the remaining 45,900 acres are dedicated to processing potatoes.

"Another 4,000 acres of processing potatoes are anticipated to be planted in 2020," says Hochstein. "All of this will happen on irrigated land in southern Alberta where farmers have increased water efficiencies in the last decade. This is not at the expense of

other crops. We are continuing our one-in-four-year rotations."

According to an August 15, 2019 report from the United Potato Growers of Canada, a hailstorm devastated about 3,000 acres of potatoes in the Taber, Alberta. It's not clear what will be salvageable. Hochstein confirms that yields are expected to be average on the remaining crop.

South of the border the \$250 million Lamb-Weston plant expansion in Hermiston, Oregon is up and running for



the fall 2019 crop. And more capacity, valued at \$300 million, will be added by McCain Foods in Othello, Washington in time for the 2021 crop. The growth is spurred by consumer demand for frozen potato products and French fries.

This overview sets up an interesting dynamic for price negotiations which will start in the fall of 2019. Growth brings its own set of challenges. In Alberta, cost of production increases are estimated at 7.5 per cent driven by costs of

capital expansion priced in USD. Labour costs -- \$15/hour in Alberta are the highest in Canada -- and the difficulties in retaining highly skilled staff remain an issue. Power prices are skyrocketing with storage costs rising every year.

"It puts growers in North America in a good position to request an increase," says Hochstein.



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ALLIUM PRODUCTION NEWS

A scattered start for leek moth in 2019



Figure 1. An adult leek moth on sticky card accented by the tip of a paperclip.

TRAVIS CRANMER

Leek moth (*Acrolepiopsis assectella*) is a destructive pest of Allium species including onions, shallots and chives, but prefers leeks and garlic. All parts of the plant including the leaves, stems, flower stalks, scapes, and bulbs are targeted. Feeding injury in leeks and green onions renders the crop unmarketable while in garlic the moth destroys leaves, bores into the scape and cloves and also creates an entry point for fungi or bacteria.

Leek moth was first detected in Canada near Ottawa in 1993 and has since spread west through Ontario, east towards the Maritimes (Québec, New Brunswick, Prince Edward Island), and south into the United States (New York and Vermont). During the 2018 season, leek moth was captured throughout southwestern Ontario and was identified as far west as Lambton and Chatham-Kent counties. So far, leek moth has not been detected in Essex, Elgin, Niagara or Bruce counties.

Managing leek moth -- once it is established -- has shown to be difficult. In areas with high infestations, floating row covers are often the most effective pest management strategy. Row covers are generally hard to implement over large acreages and must be applied prior to adult activity in each generation in order to be effective.

The efficacy of insecticide applications is difficult to assess. Leek moth larvae are often found near the plant's meristem or in the stem or scape which makes it difficult to make contact with an insecticide. As the larvae grow older, they venture out onto the leaf which makes them more vulnerable to the insecticide application. Not all female leek moths lay their

eggs the same day, or in the same week, which makes it even more difficult to time an insecticide application. Population peaks vary based on many factors and this year we found fields that were relatively close to each other had different peaks in the leek moth captures.

The best way to determine the level of leek moth pressure in your field is to monitor using a pheromone trap lined with a removable sticky card (Figure 1). Traps and lures can be purchased from Cooper Mill Ltd (ipm@coopermill.com) and Distributions Solida (info@solida.ca). Order Delta 1 traps with removable liners and mount the trap in the field at the end of April as adult moths emerge from overwintering spots when night temperatures reach 9.5°C. Place at least two traps per field, near the field perimeters, as this is where the highest leek moth numbers are usually observed. Each trap requires at least 14 sticky cards for the season and if the pheromone lure is changed every three weeks, you would require approximately five lures per trap. Extra traps are always a good idea, as traps are sometimes lost or damaged.

This year, more than 10 conventional and organic garlic and leek fields were monitored in southern Ontario (Figure 2). There was no clear peak flight of male moths early in the season as there has been in previous years. Many regions in southwestern Ontario experienced a cool, wet spring which likely influenced the first flight of overwintering adults.

Insecticide applications are best when targeted at the second generation of leek moth larvae which was between the first week of June to around mid July this year. If the number of overwintering moths trapped was low and minimal

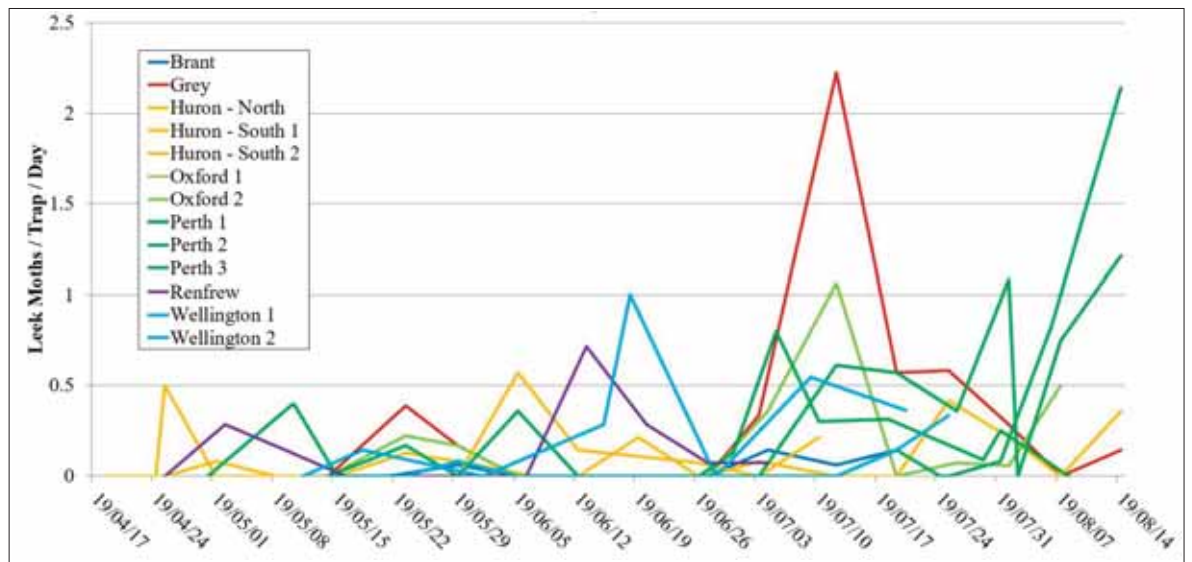


Figure 2. Leek moth counts from multiple traps in garlic and leek fields in various Ontario counties in 2019. No clear peak flight of male moths early in the season as there has been in previous years.

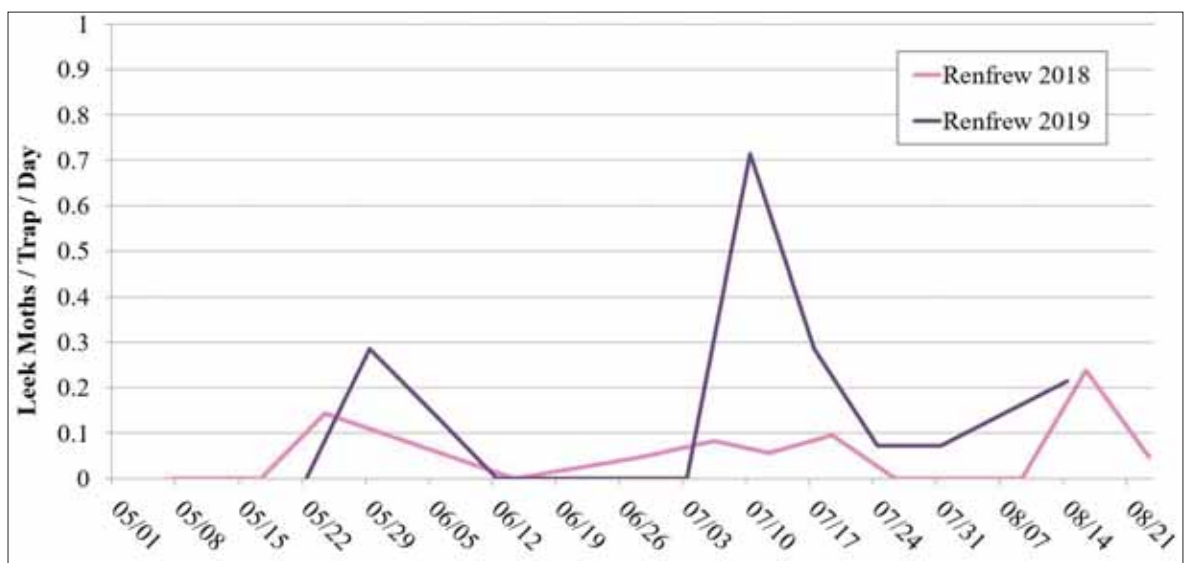


Figure 3. Leek moth counts at a field site in Renfrew county. With no conventional insecticides applied, the level of captured leek moths doubled in 2019 (purple) compared to 2018 (pink) at a site in Renfrew county.

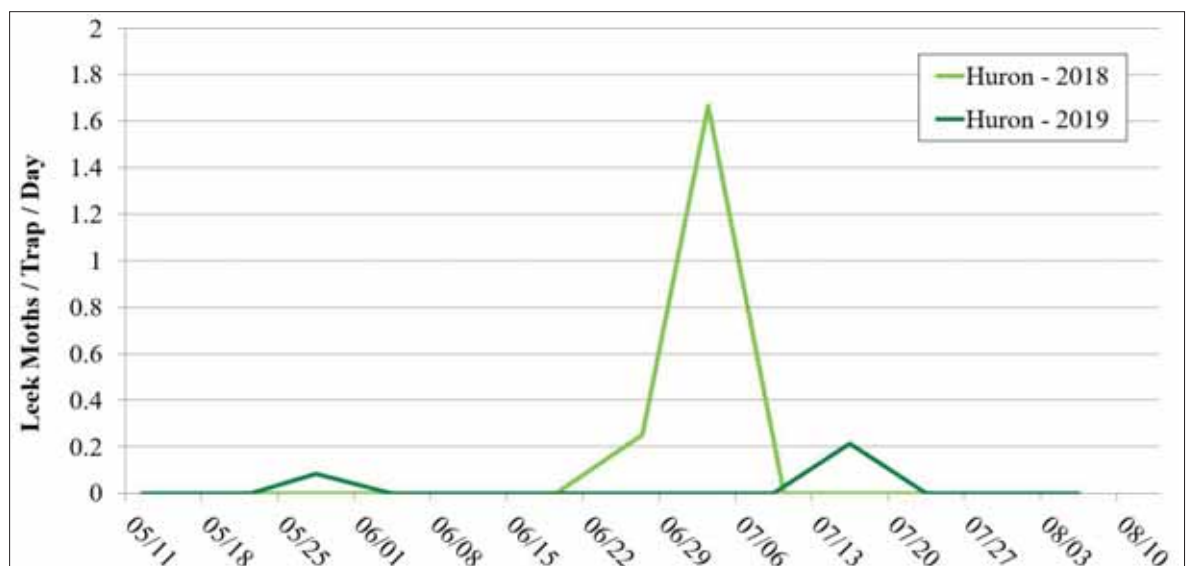


Figure 4. Leek moth counts at a field site in Huron county in 2018 (light green) and 2019 (dark green). Two insecticide applications were applied after the second peak in June 2018 corresponding to peak moth counts using sticky cards. Research suggests that timing insecticide applications directly after peak insect captures have the best chance at reducing leek moth populations.

damage by first generation larvae was seen in the field, a single insecticide application 10 days after the peak of the second flight would be most effective. If the damage to the crop was moderate to severe the previous year, and/or the trap counts of overwintering moths were high and damage by first generation larvae was observed in the field, two insecticide applications may be necessary. Two applications will target the most larvae if they are applied three days after the date of peak moth capture and the second treatment 14 days later. Currently, Matador 120EC, Bioprotec CAF, Delegate WG and Entrust are registered for leek moth management in garlic

in Canada. These insecticides are most effective when they make contact with the larvae.

In 2019 several of the same fields from the previous year were monitored and differences in the adult moth populations were recorded. With no conventional insecticides applied, the level of captured leek moths doubled in 2019 compared to 2018 at a site in Renfrew county (Figure 3). However, exclusion nets at this field site have shown to be quite effective at eliminating insect damage. At a field site in Huron county, two insecticide applications were applied after the second peak in June 2018 corresponding to peak moth counts using sticky cards (Figure 4). Traps counts at

this location suggest that the level of leek moths present are much lower here than they were in 2018.

Work is being conducted to evaluate a parasitic wasp as a biocontrol for leek moth. Releases of *Diadromus pulchellus* in Ontario have been conducted by researchers at Agriculture and Agri-Food Canada (AAFC, Dr. Peter Mason's lab) over the last decade. Early research shows that *D. pulchellus* overwinters in Ontario and its impact in reducing leek moth populations in a commercial setting is currently being evaluated.

Continued on next page

OFVGA ISSUES AND ACTIVITIES

Gearing up for a busy autumn season



GORDON STOCK
SENIOR POLICY ADVISOR &
GOVERNMENT RELATIONS,
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In addition, the OFVGA will be looking to see each party's position on the current business risk management suite, single-use plastics and trade.

Ontario government summer activities

Although the Ontario government does not sit until after the federal election, Ministers and Members of Provincial Parliament have been busy working on announcements and meeting with constituents. The Ontario Ministry of Agriculture, Food and Rural Affairs is no exception, making at least a dozen announcements from the beginning of July to mid-August. The focus includes everything from Foodland Ontario retail display winners, Excellence in Agriculture awards, funding offered through the Canadian Agricultural Partnership and everything in between.

As Ministers and MPPs begin to come back to Queen's Park, the OFVGA is looking forward to reconnecting with the government and establishing relationships with MPPs, some of whom were granted new portfolios in June during the cabinet shuffle. Congratulation letters were sent to those with new portfolios back in July.

Ontario blue box modernization

Ontario recently completed an initial investigation phase with advisor David Lindsay to look at how to improve Ontario's blue box program. The main changes being contemplated are how to

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

Federal election approaching

On October 21, Canadians will be heading to the polls to elect the government that will lead the country for the next four years. In the lead-up to the election, the OFVGA has been working closely with its national partner, the Canadian Horticultural Council, to ensure some key priorities are top of mind with the federal political parties on the election trail.

From OFVGA's perspective, the top priorities include improving water monitoring and product usage data available to the Pest Management Regulatory Agency for its re-evaluation program, financial protection for produce sellers, and strengthening foreign labour programs, such as the Seasonal Agricultural Worker Program.



Photo by Glenn Lowson

transition the program to be fully funded by brand owners and how to increase recycling rates in Ontario, which has stalled in the 60 per cent range.

The OFVGA submitted a response to this consultation, outlining concerns around the need to consider food safety, industry competitiveness and appropriate implementation timelines. The full submission can be found at www.ofvga.org/news. Mr. Lindsay's summary report was released in August and although it outlines a high-level plan to move to a program that is fully funded by industry, it acknowledges many hurdles that need to be overcome and suggests an implementation timeline of six years.

As this was only the beginning of this process, the OFVGA will remain engaged as the province determines specific changes to the blue box program.

Unwanted pesticide collection

CleanFarms is holding a collection drive for unwanted pesticides and livestock medications in a number of locations between September 20 and October 1, 2019. Farmers are encouraged to gather up their obsolete products and bring them to their nearest collection site on the designated day. For more details on what will be accepted, how to transport the materials and specific dates and times, please visit www.cleanfarms.ca.

Farm machinery on roadways

A brief reminder that the Ministry of Transportation of Ontario (MTO) has a guide available for specific rules regarding moving farm equipment between farms on public roadways. Farmers are encouraged to read, understand and follow the guide to ensure the safety of other motorists and farm employees. The guide can be accessed on the MTO website, searching for "Farm Guide

Farm Equipment on the Highway."

A revised guide is being written in consultation with the Ontario Federation of Agriculture to address more recent changes such as driving under the influence and distracted driving. Any concerns farmers have with how the rules are enforced are encouraged to contact the OFVGA.

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

A scattered start for leek moth in 2019

Continued from last page

Always observe a three-year or more crop rotation and avoid planting near infested areas from the previous season if possible. Collect and destroy any scapes or stems that show any sign of leek moth damage including the pupae (Figure 4). After the crop is harvested, check for small, two mm-wide holes in the sheath of the garlic bulb and cloves and cull any that you find. Burying plant debris after harvest will also reduce pupae and larvae populations.

If you are a grower of garlic, onions, Brassicas, potatoes, carrots, tomatoes, peppers, sweet corn or cucurbits, you might be interested in an IPM Scouting Workshop in Kemptville October 29th and 30th. Register by calling the Agricultural Information Contact Centre (AICC) at 1-877-424-1300. The garlic portion will focus on production as well as pest management while most of the remaining

information will focus mainly on pest identification and management. Agenda with times for the different crops will be released shortly. E-mail travis.cranmer@ontario.ca if you have any questions.

We are also hosting a Garlic Production and Pest Management Workshop this winter in Guelph. Topics include purchasing clean seed, row spacing and crop density, cultivar selection, crop insurance options, choosing the right equipment, crop rotation, processing, leek moth management, garlic viruses as well as information on bulb and stem nematode and other garlic diseases. If you or anyone else you know would like to attend the garlic workshop this December, please register by calling the AICC at 1-877-424-1300.

Travis Cranmer is a vegetable crops specialist for OMAFRA.



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CHAIR'S PERSPECTIVE

Preparing for the unpredictable



BILL GEORGE JR.
CHAIR, OFVGA

unpredictability at the feet of climate change is not the topic of this column, but there's no doubt that our new reality is one of more extreme weather events.

Our hot temperatures are hotter than they've generally been in the past with records being broken in many parts of the globe this year already, and when we get rain, we get more of it during shorter time periods than what we've long considered as "normal."

The big question for us as growers in the short term is what this does to our ability to manage our crops – and longer term, what this climatic unpredictability could mean for food security and our ability to feed ourselves.

But the unpredictability we're facing isn't just limited to the weather. We've also been riding a rollercoaster with respect to our trade environment. Political turmoil in the U.S., the new trend towards politics by tweet and the disruption of long-standing global trade relationships are all taking their toll on the Canadian economy as well.

Sometimes it's a direct hit,

like when the U.S. levied tariffs on Canadian steel, and other times we are just collateral damage in larger upheaval such as growing tensions between the U.S. and China. The challenge is the uncertainty of not knowing what might come next and when. The underlying message for growers in all of this is that we need to be prepared – and yes, that can be difficult when you don't know exactly what to prepare for.

So what is your grower organization doing about this?

We're making sure we continue to have strong relationships with our provincial and federal governments so that when the next crisis hits, political leaders know who we are and how they can help us weather the storm. For example, that includes lobbying for robust safety nets programs and other support systems, such as financial protection legislation that ensure growers are paid for the produce they sell, that can help farm businesses while our industry works to address longer-term solutions.

Those longer-term solutions include diversifying our trade relationships beyond just our

traditional partnerships with the United States – and we have more available opportunities before us than we've had in a long time. For example, we have a new free trade agreement with the 28-member European Union as well as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) between Canada and 10 other countries in the Asia-Pacific region. OFVGA members, such as the Ontario Greenhouse Vegetable Growers, are actively participating in international missions to build new trading relationships.

The OFVGA provides directors, staff support and financial contributions to the Canadian Horticultural Council (CHC) to ensure a strong national voice for our sector. I serve as a director on the CHC board, OFVGA board members Brian Gilroy and Jan VanderHout are CHC's president and first vice-president respectively, and other Ontario representatives serve on CHC's committees.

OFVGA was at the table during the lengthy trade negotiations with the United

States and Mexico to revamp the North American Free Trade Agreement to make sure officials were aware of the challenges of perishable horticultural products.

As OFVGA chair, I represented Ontario horticulture at the recent federal-provincial-territorial ministers of agriculture meetings in Quebec City and will be attending the United Fresh Washington Conference, a produce-industry advocacy event in Washington D.C., this month.

The very global nature of our markets makes it important for us to build relationships beyond our provincial borders and keep on top of developments in other regions that may well have impact on what we do in our fields, orchards, vineyards and greenhouses.

In many ways, we're in uncharted waters and it can be difficult to predict what the future will bring. But the OFVGA will continue to do its best to represent the needs of Ontario fruit and vegetable growers – and if you have thoughts, ideas or suggestions, we'd be pleased to hear from you.

To say that this year has been a challenging one in farming would be an understatement. There are few growing seasons in my farming career that have seen the wildly swinging weather patterns we have been experiencing and are continuing to deal with as 2019 progresses.

An extremely wet spring with prolonged cool temperatures got us off to a slow start, regardless of the crops we grow, and now many areas of the province are dealing with the exact opposite problem – not enough rain. Whether or not we can lay the blame for this

WEATHER VANE



Thanks to these summer students, invaluable research is conducted at the Muck Crops Research Station at Bradford, Ontario. As part of the farm crew, they assist agricultural technicians in plot layout, seeding, transplanting, weeding, harvesting, evaluation of research samples, recording data, doing calculations and data entry. All are returning to university. At the very far left, Alex Balduckie, Lakehead University; Johanna Bronsveld, University of Guelph, Ridgeway Campus; Christine Dervaric, University of Guelph. Best wishes in your studies! Photo by Glenn Lawson.

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THE GROWER

URBAN COWBOY

Here's an event – and take-home messages – that consumers understand



OWEN ROBERTS
U OF GUELPH

late spring, a federal private member's bill to declare a national local food recognition day tied to Thanksgiving failed to get past the Senate. The bill stalled with unusually little attention, and with no cheering one way or another from the agriculture sector.

It was in a tough spot. On one hand, it could hardly be faulted for getting behind anything from Ottawa that drew more attention to farming and food production.

But on the other hand, Thanksgiving was already being looked after by...well, by Thanksgiving. Agriculture realized the growing season is what needed to be celebrated across the country -- the way producers usher it in, the way chefs and restaurants present it, and the way consumers celebrate it. We're collectively immersed in the growing season in August, when Food Day Canada is recognized, and so many fruits and vegetables are ready.

If there's going to be a National Food Day officially declared by Ottawa – and there should be -- it should be in August.

This year, the August civic



holiday weekend weather couldn't have been better in southwestern Ontario for eating outdoors. We started breakfast on our back porch with peach and blueberry pancakes drizzled with maple syrup, and finished with a pork BBQ at my daughter and son-in-law's farm near Thamesville.

It reminded me that summer is about access to food. And the take-home lesson is that food is about more than nutrition. Food has a huge feel-good factor that

provides comfort and some measure of social unification during turbulent times – like the ones we're in now. Municipalities need all the help they can get from initiatives that bring people together under a common theme, and food can do it.

But now that Food Day Canada has passed for this year, agriculture must keep its foot on the gas. Agriculture touches society daily, in a way other sectors don't. That means it has multiple opportunities to remind consumers of the value it provides.

Unfortunately, it doesn't have nearly enough financial or human resources available to do so. So it needs help from the likes of Toronto Mayor Tory, and federal agriculture and food minister Marie-Claude Bibeau, who used the August event to speak about instituting a national food policy.

That's fine. Her perspective raises the profile of Canadian producers, who need all the help they can get. This year, besides late planting woes, there's the unanticipated trade wars with the U.S., as well as sanctions that farmers face from

China.

These sanctions have primarily hit canola and pork producers. But their ramifications are everywhere. Case in point: Marcel Rheault, co-proprietor of Rheault Distillery in Hearst, had lined up buyers in China last fall for his award-winning Loon vodka – at about the same time Canada detained Chinese business executive Meng Wanzhou at the request of the U.S. where she is wanted.

"After that," he told me, "the business connections we'd made in China stopped sending us emails, and stopped answering ours."

Canadians can be made to understand why agriculture and food in this country constantly needs their support and help, and why it's in their best interest to buy Canadian. Says Food Day Canada funder Anita Stewart, food laureate for the University of Guelph: "For those who truly believe in our nation, shopping is a political act."

Thank goodness for Food Day Canada's role in reminding the country about agriculture's many contributions – and the challenges it faces -- every day.







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BITS AND BITES

Alliston: new potato variety



After a decade of development and field trials, Quebec breeder André Gagnon has named a potato variety after

the spud capital of Ontario. It is scab-resistant and tastes a lot like Yukon Golds.

The potato is round to oval

shaped, has smooth skin and white flesh, with an early maturity and resistance to the common scab, the most common potato disease in the province.

The process to develop and register the potato with the Canadian Inspection Food Agency took a decade says Dr. Eugenia Banks, a consultant to the Ontario Potato Board. She has conducted trials for three years.

Potato variety development is a long and tedious process, that starts in the field but continues to the lab for taste tests.

"I have seen a few varieties that made it all the way through the rigorous selection process only to fall victim to problems with fusarium dry rot or some other issue that never surfaced despite all the years of testing," says Banks.

The variety was on display at the August 22 Ontario Potato Field Day at HJV Equipment in Alliston.

Also on display was a new Grimme field loader which had just arrived from Germany, the first one in North America. Depending on harvest conditions, a single trailer of potatoes

can contain up to 20 per cent soil/trash. This can amount to as much as 1,000 tons per 100 hectares, according to studies by Grimme. The new field loader is designed to reduce this trash content saving both time and money by limiting the amount of trash on the static grading line during harvest.

Four large wheels on a tandem axle help to keep ground pressure to a minimum while ensuring a smooth ride during road transport. The field loader has output of 120 tonnes/hour depending on soil type, crop and conditions.

COMING EVENTS 2019

- Sept 7-8 Stratford Kiwanis Garlic Festival, Stratford, ON
- Sept 10 Berry Growers of Ontario Twilight Tour, Thames River Melons, Innerkip, ON
- Sept 10-12 Canada's Outdoor Farm Show, Woodstock, ON
- Sept 14 Farm & Food Care Ontario Breakfast on the Farm, Barrie Hill Farms, Springwater, ON 9 am to 1 pm
- Sept 15 Toronto Garlic Festival, Artscape Wychwood Barns, Toronto, ON
- Sept 16-18 United Fresh Washington Conference, Grand Hyatt, Washington, DC
- Sept 18 Grape Growers of Ontario Celebrity Luncheon, Club Roma, St. Catharines, ON
- Sept 18 Ontario Produce Marketing Association Golf Tournament, Lionhead Golf & Country Club, Brampton, ON
- Sept 17-21 International Plowing Match, Verner (Municipality of West Nipissing), ON
- Sept 19 What's Growin' On, Vineland Research and Innovation Centre, Vineland Station, ON
- Oct 5 Soupfest, Ansnorveldt Park, Bradford, ON
- Oct 9-10 Canadian Greenhouse Conference, Scotiabank Convention Centre, Niagara Falls, ON
- Oct 17-19 Produce Marketing Association Fresh Summit, Anaheim, CA
- Oct 21 Federal election
- Oct 24 Farm & Food Care Ontario Harvest Gala, Guelph, ON
- Oct 27-29 Advancing Women in Agriculture Conference, Sheraton on the Falls, Niagara Falls, ON
- Nov 1-10 Royal Agricultural Winter Fair, Enercare Centre, Toronto, ON
- Nov 6-9 North American Strawberry Growers' Association European Tour, Netherlands and Belgium
- Nov 13-14 Canadian Centre for Food Integrity Public Trust Summit, Saskatoon, SK
- Nov 15 Ontario Produce Marketing Association Annual Gala, Universal Event Space, Vaughn, ON
- Nov 19-21 Potato Growers of Alberta Conference and Tradeshow, Sheraton Red Deer, Red Deer, AB
- Nov 28 Canadian Agricultural Hall of Fame induction ceremony, Fairmont Le Chateau Frontenac, Quebec City, QC
- Dec 3-4 GrowCanada Conference, Calgary, AB

What's Growin' on in Vineland

If you're an apple grower, you'll be interested in the latest apple breeding research to be showcased at the September 19 open house of the Vineland Research and Innovation Centre. The open house is scheduled for 6 pm. Go to the Victoria Avenue Research Farm off Victoria Avenue at Vineland Station. Deadline: September 18. Register by September 18 at <https://tinyurl.com/yyxm5680>



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RETAIL NAVIGATOR

Where do your consumers shop?



PETER CHAPMAN

Use your consumer profile

Using your consumer profile, determine where your products have the best chance of selling. There are many segments of the market and consumers are more demanding all the time. Producing products without considering the consumer (end user) and the customer (retailer) will be frustrating for you and your customers. When you determine the best place for your products to sell, you will be more aligned with the people you are selling to.

Consider the following scenarios:

You have defined the consumers likely to buy your product as being larger households, looking for lower prices and the more basic or popular items. They are busy people and food is not really an exciting part of their day. The lower their grocery bill, the better. You should be trying to sell into the discount stores. A second option would be warehouse clubs or large superstores.

Perhaps you pack in larger sizes and your business is set up to ship full pallets. You get excited about efficiencies and this is appealing to a value-conscious consumer. They buy larger amounts in each shop and they prefer sizes that might not be available at conventional stores. This would lead you to focus on warehouse clubs or perhaps the large superstores.

Some consumers are more knowledgeable about food. They like to find new items and devote the time to interesting recipes. These are shoppers who would be shopping at specialty stores, conventional stores or perhaps farmers' markets. If you are a producer focused on more premium items and trying to introduce new varieties and perhaps a mix of specialty items, this is your segment of the market.

Often we see producers selling to different market segments, which might be right for their business. Just remember, the category manager or buyer in the conventional store will have different priorities than the person working at a discount chain. This can increase your marketable yield, as some stores are looking for larger sizes in big bags whereas others might want smaller sizes or bulk.

Your consumer profile should lead you to the right locations to sell your product(s).

Consumers are always changing. We see more focus on their level of engagement regarding packaging; this was not even a consideration for many consumers a few years ago. Some retailers are moving faster than others on this issue so if

consumers are telling you it is an issue for them and you are making investments to initiate change, determine where they shop and approach these retailers with your innovation. Retailers should be hearing the same thing and be looking for the innovation you bring to the market.

The sales process in your business will be much more rewarding when you determine where your consumers shop. You will be aligned with your customers and much more likely to deliver the best results.

If you have any questions about understanding where consumers are likely to buy your products please give me a call at (902) 489-2900 or send me an email at peter@skufood.com. Next month we will discuss how to increase the alignment you have with your customers by understanding them better.

WHAT'S IN STORE?

Plant-based protein

It is incredible to see the shelf space devoted to plant-based protein in stores. You can find the largest number of SKUs at Whole Foods, as their consumers would certainly embrace many of these products. These trends seem to happen faster all the time and product distribution to a wider consumer segment also grows to meet the demand.

The well-publicized launch of the Beyond Meat Burger is



These are fresh patties available at Loblaw. Interesting how they promote these fresh patties in the dairy section to appeal to consumers looking for cheese for their burger or perhaps an alternative to dairy protein.

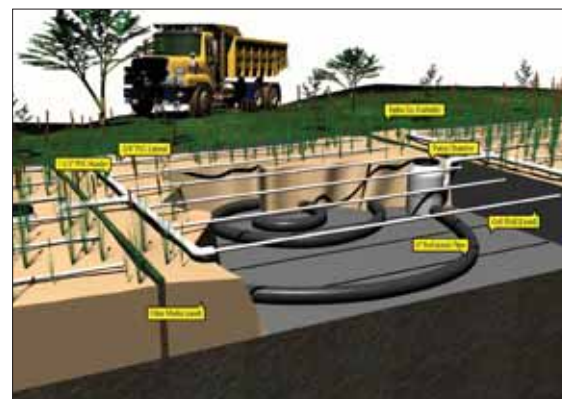
just one example. There is a shift in what consumers are buying and eating. Every time we see a category grow like this there will be winners and losers. Most retailers try to maintain the policy of de-listing an item every time they list a new one so there will certainly be some products coming out of the assortment to make room for the new plant-based protein items.

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

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AQUA Treatment Technologies Inc. designs and installs the 'AQUA Wetland System' (AWS) for tertiary treatment of many types of waste water including sanitary sewage, landfill leachate, dairy farm & abattoir wastewater, greenhouse irrigation leachate water & mushroom farm leachate water (i.e. manure pile leachate) and high strength winery washwater.

The 'AQUA Wetland System' is operated out of doors and can achieve year-round tertiary treatment of wastewater. This sub-surface, vertical flow constructed wetland consists of sand & gravel beds planted with moisture tolerant plant species. Water is pumped vertically from cell to cell. There is no open or standing water. Treatment occurs through physical filtration & biological degradation. Plants shade & insulate the cells, cycling nutrients while preventing algae growth. There is no production of sludge.



The AWS has been approved for use by the Ontario Ministry of Environment through over 40 Environmental Compliance Approvals. Recently the Region of Niagara began approving the AWS for treatment of 'small flow' winery washwater i.e. < 10,000 liters per day. Other agencies who have issued approvals include Health Canada, USEPA and OMAFRA. Recent projects include:

- 1) treatment & re-use of greenhouse irrigation leach water at greenhouses in Niagara & Haldimand
- 2) treatment of winery wastewater at Greenlane Estates Winery & numerous other in Niagara
- 3) treatment of landfill leachate at sites in Pembroke, Niagara and Alabama

For additional information please contact Lloyd Rozema at 905-327-4571 or email lrozema@aqua-tt.com



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MAKING MOVES

Recent closing of multiple trucking companies should be on your radar



JENNIFER MORRIS

The news for truck companies in the last few months has been grim. News of bankruptcies and closings have been on the rise. But why should this news be on the radar for food companies?

Transportation is integrated into every part of our society and trucking is more than a

\$800 billion business in North America. Any disruption to this industry will indeed affect all others.

First, why are there so many closures?

2018 was a pretty good year for trucking companies -- rates were up and the amount of freight available was good. This led to companies buying more trucks and hiring additional drivers. However, those good times were short-lived and now the market is very slow and companies have not been able to keep the cash flowing.

There are many theories as to why the trucking industry is struggling -- everything from it's part of the business cycle to it being a casualty of the current U.S./China trade war to Amazon and its freight brokerage with unreasonably low rates.

Regardless of the cause, it is an issue and it will continue for a while before the industry possibly rebounds.

Potential domino effect

The closures are not just of small mom-and-pop shops but substantial ones with many employees and drivers. So far thousands of drivers have lost their jobs in what is being referred to as a "blood bath." In the first quarter of 2019, approximately 100 more trucking companies failed than in the previous time frame in 2018. Also in July 2019, the number of trucks purchased fell to its lowest level in almost 10 years. Companies such as small trucking parts businesses and mechanics could be affected in the wake of these large bankruptcies.

Effects in the world of produce

So far the low freight rates are likely a blessing for all the produce companies looking to move their wares. However, there is a difference between competitive and unreasonably low. There is a cost to running a lane and once a rate drops below that, carriers cannot maintain the service level they may have in the past. The other issue is now that some companies have gone out of business and drivers leave the industry for more consistent employment, when product starts moving again at 2016 levels and beyond, we will be looking at a substantial shortage of capacity.

How to keep ahead

Make sure you are having conversations with your main

group of carriers. Make sure that they are being paid a reasonable rate. Make sure that shippers and receivers in your supply chain are doing their part and making sure drivers are loaded and unloaded in a timely manner. These simple gestures will make your company a desirable partner when the business is booming again.

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

FOCUS: GREENHOUSE INNOVATION

Middle East will be site of Green International Ventures

Mastronardi Produce Ltd., North America's leading grower and distributor of greenhouse produce, and visionary John Paul DeJoria have selected the Middle East as the first market in which to develop the world's largest and most technologically advanced indoor farming project.

The newly formed company, Green International Ventures LLC (GIVE), will make locally

grown fresh produce more widely available around the globe via its proprietary Advanced High-Density Farming System. This will be the first project for the groundbreaking GIVE venture, and it will reduce the Middle East's dependence on imported food, create a sustainable source of local employment and significantly increase the region's non-petroleum-based exports.

"As pioneers in the greenhouse industry, we are passionate about increasing access to local, sustainably grown fruits and vegetables," says Paul Mastronardi, president and CEO, and the fourth-generation family member to lead Mastronardi Produce. "Our first location in the Middle East will allow us to reach more than half the world's population in less than eight hours, and this is

just the start. Look for more global locations as we continue to scale to meet the growing need for food security, safety, and sustainability."

GIVE will also support the integration of modern AgTech initiatives into the local farming community and expand knowledge of sustainable agricultural techniques by establishing a permanent Research and Development facility in the region.

"It has long been my passion to help feed the world's population," says John Paul DeJoria. "The introduction of this revolutionary model in the Middle East is the first step of many towards increasing global access to sustainably grown fruits and vegetables."

All GIVE projects use innovative Advanced High-

Density Farming Systems that incorporate a multitude of cutting-edge growing systems, such as water-saving irrigation and energy-efficient lighting, and they take advantage of advanced automation and robotic devices, AI processes for predictive analysis, and real-time crop and soil monitoring.

Produce grown in these innovative AgTech systems will be marketed under the SUNSET brand. Known for award-winning flavour, innovation, and packaging, SUNSET's many exclusive labels include Campari, the world's first branded tomato, and the uniquely colourful Aloha pepper.

SUNSET of Holland will be the first distributor for the GIVE partnership.

Source: Mastronardi Produce

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FOCUS: GREENHOUSE INNOVATION

A digital tool for precision growing

Grodan, part of the ROCK-WOOL Group, has now launched e-Gro in the North American market. E-Gro is a software platform for data-driven precision growing, giving growers smarter insights into the greenhouse to fully optimize cultivation. E-Gro was officially launched in the Netherlands during the HortiContact trade show in February of 2019 and was awarded the Concept Innovation Award at GreenTech in June 2019.

In the greenhouse, the decisions that growers make today have a major impact on tomorrow's results. Smart innovations such as cloud solutions and Internet of Things applications are connecting the

greenhouse, while AI learning and Big Data are allowing growers to level up their cultivation. But, merging all these available tools and data to support decision-making is complex and time consuming. That is, until now.

After the successful introduction of the E-Gro app, Grodan is taking the next digital step with the e-Gro software platform. e-Gro supports a grower's knowledge, experience and growing strategy with valuable insights and smart recommendations based on the root zone, climate, crop and harvest data. Growers are in control, with 24/7 visibility into the greenhouse environment, anywhere and everywhere, to make informed decisions to



maximize the harvest.

With the e-Gro launch, Grodan is now at the forefront of the digital greenhouse transformation worldwide. Data-driven cultivation via an intelligent software platform is now becoming a reality. E-Gro can be linked to the most common climate computer systems and is available for

smartphone, tablet and desktop.

Grodan has been at the forefront of crop optimization for 50 years, with a strong focus on precision cultivation. After the development and successful introduction of data-driven technologies in the greenhouse such as the Grodan Water Content Meter (WCM), the Grodan 6-Phase advice model

and GroSens MultiSensor, the renewed e-Gro platform is the next step in data-driven precision growing.

Learn more at www.grodan.com/e-gro

Source: Grodan August 12, 2019 news release

Testing a scouting robot

KAREN DAVIDSON

The Guelph Intelligent Greenhouse Automation System (GIGAS) is an integrated robotics system for automating the most labour-intensive tasks in a vegetable greenhouse. For growers, that's harvesting and de-leafing.

However, using a robot in a greenhouse is very challenging due to many factors such as the high intensity of plants resulting in lots of overlap, the required speed of operation and high initial costs. To overcome these challenges, GIGAS adopts an innovative data-driven design that monitors every plant in a greenhouse.

This level of detail goes beyond precision agriculture to micro-precision agriculture. Due to feedback from stakeholders such as the Ontario Greenhouse Vegetable Growers (OGVG) and OMAFRA, GIGAS was expanded to include other important tasks such as scouting for diseases, monitoring plant growth and enhancing labour efficiency.

"The sector is not all the same," says Moussa. "There are small growers with six acres and then big growers with layers of management. Both need to know how many tons of production will be produced for the various marketing channels at any given time." A prototype of a scouting robot is currently in field testing in a commercial greenhouse in Leamington, Ontario. Results will be known in the spring of 2020.

"The overall objective of this proposal is to build on the current GIGAS scouting prototype and previous research in harvesting and de-leafing to develop and field test an

autonomous integrated prototype for a harvesting/de-leafing robot," explains Dr. Medhat Moussa, School of

Engineering, University of Guelph. The project is funded through the Canadian Agri-Science Cluster for

Horticulture 3 along with the Canadian Horticultural Council and industry contributors. Moussa has been working

with the greenhouse industry for nine years, engaging with stakeholders on their need

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FOCUS: GREENHOUSE INNOVATION

Smart lighting is on the horizon

KAREN DAVIDSON

In a recently conducted McKinsey consultants' study, agriculture rated in the lower ranks in terms of adopting digitization at a rate of only 10 per cent. Horticulture is about to change that reputation as more growers adopt LED lighting in greenhouses – equipped with cameras.

“This is the perfect moment to combine lighting and cameras,” says Jeff Bisberg, CEO of Illumitex. “It’s the catbird position in the greenhouse to see everything.”

Illumitex, a Texas-based company, has been helmed by Bisberg since 2017, and no one knows better how disruptive new technologies can be. Years ago, as a recent graduate, he witnessed the death of Polaroid as digital cameras came on the scene. When he became CEO of the company founded in 2005, Bisberg decided to shift focus to horticulture with a unique selling proposition: LED lighting installed with digital cameras.

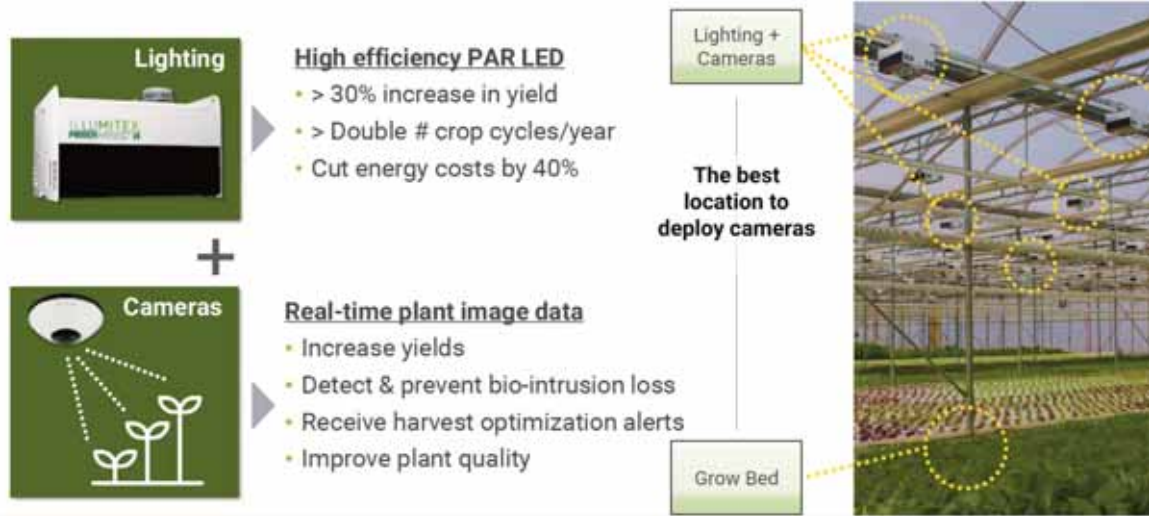
“Horticulture is ripe for new

innovation,” says Bisberg. “Lighting is food for plants and we can increase productivity with more crops per year.”

Until lately, inputs have been measured by growers but the output data have been missing. Photos – taken every hour -- can be used to estimate fruit yields, to analyse fruit colour or to calculate pest pressure. Algorithms combined with machine learning can provide actionable data in real time. This means growers now have the ability to pinpoint problem micro-patches in mammoth-sized greenhouses and to take remedial action.

Concurrently, the rise of cannabis fuelled by outside investors, has changed the dynamics of the greenhouse sector. A small increase in yield – even just one per cent -- with such a high-value crop can translate into significant dollars. The learnings from cannabis are now being transferred to digitizing greenhouse vegetables.

As Bisberg explains, the biggest cost for greenhouses is lighting, but Illumitex can add value with cameras. The tipping



“This is the perfect moment to combine lighting and cameras. It’s the catbird position in the greenhouse to see everything.”

~ JEFF BISBERG, CEO OF ILLUMITEX

point for rapid rates of adoption of new technology is usually about 10 per cent.

“We’re very close to the tipping point in LED adoption in horticulture,” says Bisberg. “We’re breaking the boundaries of what lighting can do.”

What Illumitex is piloting this fall in the U.S. is a FarmWatch system with the sophistication of camera that can detect insects in millimetres. The technology can distinguish the difference between a gnat, thrip or spider mite. By the same token, the

images can also identify beneficial insects. Think of FarmWatch as Google Earth for your farm.

Another more sophisticated program is Digital Scout which can scout every millimeter of your farm every hour. It may detect a colour pattern that indicates wilting. With this knowledge, the solution may be as simple as fixing a stuck valve in a specific grid of the greenhouse. The third program is HarvestBoost which can help improve productivity on the farm.

What’s very important to the Illumitex story is that all the data is “containerized” so that it is stored to the Cloud through Amazon servers and not commingled with other growers’ data. Several layers of security have been built into the system. At the same time, the grower has the ability to share with research partners.

“This technology was not possible even three years ago,” explains Bisberg. “This is ground truth imagery.”

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FOCUS: GREENHOUSE INNOVATION

Preview of Canadian Greenhouse Conference

October 9-10, 2019

KAREN DAVIDSON

Never has it been more important for the greenhouse industry to gather and share technology and ideas. The pace of change is breath-taking on a month-to-month basis, whether it's the integration of artificial intelligence or new invasive pests.

This year's Canadian Greenhouse Conference is scheduled for October 9 and 10, 2019 at the Scotiabank Conference Centre in Niagara Falls, Ontario.

The October 9 Vegetable Production program kicks off with Xiuming Hao, Agriculture and Agri-Food Canada (AAFC) scientist at Harrow, speaking about the latest developments in lighting greenhouse vegetables. He's followed by Jason Lanoue, University of Guelph researcher, on the effects of wavelength specific lighting and CO2 concentration on primary gas exchange and carbon export in tomatoes.

"Irrigation strategies in relation to light" will be presented by Andrew Lee, The Grodan Group, UK.



The topic of what's new in vegetable disease control will be presented by Genevieve Marchard, AAFC Harrow. Food supplements to enhance biocontrol agent activities will be presented by another AAFC Harrow researcher, Rose Labbe. Wednesday's program ends with Kirsten Leiss, Wageningen University, talking about plant resilience in greenhouses.

For those growers in greenhouse strawberry production, a slate of topics will be kicked off by Eric Boot, BVB Substrates on fert-irrigation in soft fruits in

substrates. David Gadoury, Cornell University in New York State, will talk about suppression of diseases and pests and the application of UV light. Marc van Gennip, Genson Quality Plants, will address European strawberry production systems.

The October 10 program – specifically Artificial Intelligence (AI) and Automation – will be of interest to greenhouse vegetable growers. The opportunities and challenges of AI for greenhouses will be presented

by Kenneth Tran, Microsoft Research, Redmond, Washington. He's followed by Quade Digweed, AAFC Harrow, who will address how to prepare for AI in terms of data collection and management. Navigating data contracts will be the topic for Brian Hendel, Splice Digital, based in Windsor, Ontario.

Don't miss the topic stream on "Water." Christopher Weisener, University of Windsor, will update the situation on phosphorus in the Great Lakes. Russel Hurst,

CropLife Canada, will talk about pesticides in water.

Throughout both days, a trade show from 9 am – 4 pm will present the latest services and products in greenhouse production.

The ever-popular bus tour, sponsored this year by Svensson, will take place in the Leamington, Ontario area on October 8. The tour is capped at 80 registrants. Pre-registration is required by September 6. For details, go to: www.canadian-greenhouseconference.com/attendee-information/bus-tour

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CROP PROTECTION

Domestic governments clash on crop protection



CHRIS DUYVELSHOFF
CROP PROTECTION ADVISOR,
OFVGA

A confusing trend has been unfolding in recent years as increasingly we see federal regulatory decisions on crop protection products being challenged by individual provinces or states. This is happening both in Canada with the Pest Management Regulatory Agency (PMRA) and the United States with the Environmental Protection Agency (EPA). It is especially true in jurisdictions with large urban populations. Despite having far fewer resources than their federal counterparts, provincial/state governments are regulating in direct conflict with the feds. Surely, voter pressure a little closer to home has some influence in these decisions. The inconsistency in decision making, however, is muddling things for both growers and consumers alike.

California listed glyphosate under its state Proposition 65 law in July 2017. This is the law that requires statements often seen on consumer products stating “WARNING: This

product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.” California’s actions were a result of the International Agency for Research on Cancer’s (IARC) classification of glyphosate as “probably carcinogenic to humans.” Products containing glyphosate for agricultural use in California would be required to include the Proposition 65 warning statement on their packaging.

The problem was the IARC classification is not supported amongst any regulators. As was stated by PMRA back in January, “no pesticide regulatory authority in the world currently considers glyphosate to be a cancer risk to humans at the levels at which humans are currently exposed.” The EPA also disagrees with the IARC assessment. Just recently, EPA published a letter indicating that it deems California’s glyphosate warning to be a false and misleading statement.

Furthermore, it considers any glyphosate products bearing this warning to be misbranded and noncompliant with U.S. federal laws. It seems for now that federal authority will prevent California from putting cancer statements on glyphosate labels, but almost surely appeals will follow.

Another state/federal controversy has been unfolding around the insecticide chlorpyrifos. Chlorpyrifos is an organophosphate insecticide and also happens to be currently proposed for cancellation on food use in Canada by PMRA. Back in 2007, environmental



and farm worker groups petitioned EPA to ban all food uses of chlorpyrifos. After EPA initially proposed cancellation, it made a decision in March 2017 not to ban the agricultural use of chlorpyrifos, and extend the decision timeline to 2022 to develop a complete risk assessment. After several appeals, in April 2019, EPA was ordered to make a decision on chlorpyrifos within 90 days. In July of this year, EPA announced a final action denying the 2007 petition and maintaining current uses of chlorpyrifos.

Now, despite the fact that chlorpyrifos remains federally registered in the U.S., several states have enacted or are considering statewide bans on its use. California, New York, and Hawaii are among this list. Attorney generals from a coalition of states are now suing EPA for “not protecting Americans.” The only certain thing about this chlorpyrifos controversy is that it is far from over. While state and federal politics and the litigation culture of America explain some of the happenings in the U.S., Canada has not been immune to

this type of divergence between federal and provincial regulations.

One of the more recent examples would be Ontario’s Class 12 regulations regarding neonicotinoid-treated corn and soybean seed. Back in July 2015, regulations took effect that now require grain growers to have a field pest assessment completed before planting neonicotinoid-treated seed. This was largely presented and sold as a measure to protect pollinators. However, PMRA’s decision in April 2019 for two of the major seed treatments including clothianidin and thiamethoxam concluded that “Health Canada completed a thorough risk assessment for seed treatment uses of clothianidin and thiamethoxam which determined negligible risk to pollinators.” Class 12 regulations remain in place in Ontario in spite of the federal conclusion.

Now, I’m all for regulation of crop protection products, for the safety of workers, consumers, and the environment. But why are we fighting ourselves on how we do it? We have a highly

competent federal regulatory body in Canada with the PMRA, as is the EPA in the U.S., which have hundreds of specialized staff whose mandate it is to protect Canadians from unacceptable risks from crop protection products. Clearly, they aren’t rushing their decisions. Yet provincial and state governments, along with smaller scientific and regulatory departments reviewing less extensive datasets, reach opposite conclusions.

Unfortunately, I suppose it comes down to politics. As growers here in Canada, we should be proud and supportive of our federal regulatory system. As much as it has its own challenges – as have been written in many Crop Protection columns – it is still much better than a provincial alternative. Provincial governments all applying different standards on which crop protection products can and can’t be used would be a disaster for horticulture. For Canada, let’s try and leave domestic politics out and let PMRA do its job regulating crop protection.

CHC field tour promotes dialogue with government regulatory officials

The Canadian Horticultural Council organized a crop protection field tour for August 20. This was an important day for dialogue with guests from the Pest Management Regulatory Agency, Canadian Food Inspection Agency and Agriculture and Agri-Food Canada, including the Pest Management Centre. Other guests included CropLife Canada and Ontario Greenhouse Vegetable Growers.

The group of almost 50 visited four

Ottawa-area farms and greenhouses: Dentz Orchards and Berry Farm, Iroquois; Mountain Orchards, Mountain; SunTech Greenhouses, Manotick; and Rideau Pines Farm, North Gower.

Thanks to the grower hosts who gave tours of their fields and equipment and answered lots of questions. Commodities featured were: raspberry, strawberry, tomato, apple, cucumber, and mixed vegetable production.



SunTech Greenhouses, Manotick, ON. Photo by Chris Duyvelshoff



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CROP PROTECTION

Rainfastness of insecticides on fruit

WENDY McFADDEN-SMITH and KRISTY GRIGG-McGUFFIN

In view of the frequent heavy rains in many regions this season, understanding rainfastness of insecticides is important to ensure proper efficacy. The following information has been adapted from John Wise, Michigan State University. For the complete article, refer to www.canr.msu.edu/news/rainfast_characteristics_of_insecticides_on_fruit. Note that some products listed in this article may not be registered for use in Canada. Check with your local supplier or refer to the 2018-2019 Publication 360: Guide to Fruit Production and 2019 Supplement for a complete list of registered products.

According to Wise, the impact of rain on an insecticide's performance can be influenced by the following:

- Penetration into plant tissue is generally expected to enhance

rainfastness.

- Organophosphates have limited penetrative potential, and thus considered primarily surface materials.
- Carbamates and pyrethroids penetrate the cuticle, providing some resistance to wash-off.
- Spinosyns, diamides, avermectins and some insect growth regulators (IGR) readily penetrate the cuticle and move translaminar (top to bottom) in the leaf tissue.
- Neonicotinoids are considered systemic or locally systemic, moving translaminar as well as through the vascular system to the growing tips of leaves (acropetal movement).
- For products that are systemic or translaminar, portions of the active ingredient move into and within the plant tissue, but there is always a portion remaining on the surface or bound to the waxy cuticle that is susceptible to wash-off.
- Environmental persistence and inherent toxicity to the target pest can compensate for wash-off and delay the need for immediate re-application.



Photo by Wendy McFadden-Smith

- Organophosphates are highly susceptible to wash-off, but are highly toxic to most target pests, which means re-application can be delayed.
- Carbamates and IGRs are moderately susceptible to wash-off, and vary widely in toxicity to target pests.
- Neonicotinoids are moderately susceptible to wash-off, with residues that have moved systemically into tissue being highly rainfast, and surface residues less so.
- Spinosyns, diamides, avermectins and pyrethroids are

moderate to highly rainfast.

- Drying time can significantly influence rainfastness, especially when plant penetration is important. For instance, while two to six hours is sufficient drying time for many insecticides, neonicotinoids require up to 24 hours for optimal penetration prior to a rain event.
- Spray adjuvants that aid in the retention, penetration or spread will enhance the performance of an insecticide.

The tables found at <https://onfruit.ca/2019/08/16/rain>

fastness-of-insecticides-on-fruit/ can serve as a guide for general rainfastness to complement a comprehensive pest management decision-making process.

Wendy McFadden-Smith is tender fruit and grape IPM specialist for Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Kristy Grigg-McGuffin is horticultural IPM specialist for OMAFRA. Reprinted with permission @Queen's Printer for Ontario, 2019.

Revolutionary bio-insecticide now registered for drench application

Canadian growers looking to protect their Brassica crops from harmful pests taking a bite out of their profit margins have a new control option. Corteva Agriscience is delivering another innovative pest management solution: Success insecticide with spinosad active, now registered for drench application.

Benefits of spinosad

Produced through the fermentation of naturally occurring bacteria (*Saccharopolyspora spinosa*), spinosad is effective on flies and their maggots, while also providing systemic activity in certain crops if applied at root level. Success is safe to many beneficial insects, making it a valuable control tool and perfect fit in integrated pest management systems, especially for Brassica transplants.

Success is effective on target insects through both ingestion and contact exposure. Research trials have shown that it acts within minutes, causing the exposed insect to stop feeding.

Complete control of exposed insects is generally expected within one to three days — comparable with other synthetic insect control products and much faster than most traditional biologicals. Yet, Success provides up to two weeks of control.

Success insecticide possesses some leaf-penetrating

characteristics, has low odor and degrades rapidly in the environment, primarily through photolysis.

Spinosad drench application methodology

Applications of Success should be timed to occur when pests are still young and small — when they're most vulnerable — prior to when the insects reach a damaging level as indicated by scouting.

Success insecticide must reach the roots of Brassica plants in order to be effective against cabbage maggots. Follow the below application guidelines:

- Water the plant first to prevent the leaves from absorbing Success
- Apply 12.5ml of Success per 1000 plants
- After application, water again to ensure the product reaches the roots
- Success should be applied 24 hours to the plants before being transplanted
- Please refer to the label for more information

Now registered for drench application in Brassica crops, Success insecticide is a perfect addition to any integrated pest management system. Success is active on several important insects, with a unique mode of action, and is safe to beneficial insects, in addition to possessing an excellent

environmental profile in terms of safety to humans, mammals, birds, aquatic organisms and groundwater.

The active ingredient in Success is spinosad, the first of a revolutionary class of insect

control products called Naturalyte. These insect control products are natural metabolites derived from living organisms. To learn more about Success insecticide, please visit: www.corteva.ca/en/

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Diagnosing blueberry cankers

ERICA PATE

As I write this in August, blueberry growers across Ontario are busy harvesting the 2019 crop. It has been a good season so far, but like every year, there are always a few challenges and pests to deal with. Some of the issues can become more evident during harvest as the plants are under more stress from fruiting, including diseases such as Phomopsis canker and twig blight.

There are several stem cankers and diseases that can affect blueberries, and it can be challenging to determine what the issue is. Fusicoccum canker and Phomopsis canker will both result in rapid wilting and dying of the blueberry canes, and the leaves will turn reddish-brown and remain attached to the cane. This year we identified Phomopsis canker and twig blight. Pictures to help diagnose this disease are below. Fusicoccum cankers are distinct, elliptical lesions. Phomopsis cankers have less defined lesions than Fusicoccum cankers, and are usually flattened and elongated on the stem. Phomopsis canker



Figure 1 Blossom collapse from phomopsis twig blight

and twig blight are caused by the fungus *Phomopsis vaccinii*. The fungus is spread during cool, wet weather beginning at bud swell. Phomopsis twig blight causes blossom clusters to collapse (Figure 1) twig blights (Figure 3-4) and then develops down the stem, causing stem dieback (Figure 5 and 6). Symptoms can appear suddenly, with rapid wilting of the canes, and can often show up on a single cane on a plant (Figure 6). Look for a sunken area at the base of the cane to confirm Phomopsis canker. If you are seeing Phomopsis symptoms in your field, prune out and burn the diseased

canes. Avoid damaging canes as this can make the plant more susceptible to infection. Fungicides can also be applied from green-tip to petal fall. Cool, wet weather in the spring can cause Phomopsis spores to spread and cause infection, so plan fungicide applications in the spring based on the plant stage and the weather conditions. Thorough pruning can also contribute to Phomopsis management by increasing airflow in the canopy and reducing leaf wetness, which is needed for infection to occur.

Erica Pate is fruit crops specialist for OMAFRA.



Figure 2 Dieback of infected stems



Figure 3 Phomopsis twig blight



Figure 4 Phomopsis canker and twig blight



Figure 5 Phomopsis canker and twig blight



Figure 6 Phomopsis canker infecting a single stem

Exirel label expanded to include Spotted Wing Drosophila control on strawberries

Product	Crops	Rate	Preharvest Interval	Restricted Entry Interval	Max # applications/year	Re-treatment interval
Exirel cyantranilip- role 100 g/L Group 28 Reg. #30895	Bushberries	1-1.5 L/ha	3 days	12 hours	3-4 (max. 4.5 L/ha)	5 days
	Caneberries	1-1.5 L/ha	1 day	12 hours	3-4 (max 4.5 L/ha)	5 days
	Strawberries	1-1.5 L/ha	1 day	12 hours	3-4 (max 4.5 L/ha)	5 days
	Stone fruit	1-1.5 L/ha	3 days	12 hours	3-4 (max. 4.5 L/ha)	7 days

The Exirel label has been expanded through a User Requested Minor Use Label Expansion (URMULE) and now includes the control of spotted wing *Drosophila* (SWD) on strawberries. The rate for SWD control is 1- 1.5 L/ha. There is a 1-day pre-harvest interval and a 12-hour re-entry interval. Maximum 4 applications per season or 4.5 L/ha. Exirel is also registered for control of aphids and suppression of thrips on strawberries.

For SWD control on strawberries the label recommends applying Exirel with Hasten NT Spray Adjuvant at 0.25% v/v or MSO Concentration with Leci-Tech at 0.5% v/v. Test a small area to demonstrate safety to fruit and leaves before using in large areas.

Options for SWD control for strawberry growers now includes Exirel as well as: Delegate, Entrust, Mako, Malathion, Success and Scorio Insect Bait.

Exirel is also registered for the control of SWD on bushberry and caneberry crops. For SWD control on caneberries the label recommends applying Exirel with Hasten NT Spray Adjuvant at 0.25% v/v. For SWD control on blueberries the label recommends applying Exirel with an MSO surfactant at 0.5%-1.0% v/v. Test a small area to demonstrate safety to fruit and leaves before using in large areas.

Check out Onfruit.ca for an updated list of registered products for SWD control in 2019.