

ECOSYSTEMS

En route to building soil wealth



Some potato growers bake in success years before the crop is harvested. Here, Charles Emre (right) and his son-in-law Nick Bell examine a cover crop in July 2023 that's been cut and windrowed on their farm, Windham Centre, Ontario. The subject of soil health and the links to air, water and carbon markets is timely as the Standing Senate Committee on Agriculture and Forestry is expected to report in early 2024. Photos by Glenn Lawson.

KAREN DAVIDSON

Creating soil wealth is a long rocky path, marked by frequent twists and turns. Potato grower Charles Emre describes the science and art of building organic matter as a chess match lasting years, not hours.

"We make a move and realize that move stems back to something we did 10 years ago," he chuckles. "We've had five crops of potatoes in the last decade, switching to a cover crop every other year. We've improved the organic matter by 0.1 per cent and that's a big victory."

That incremental improvement relies on continually learning new cover mixtures and practices that deliver results on the sand plains of his Windham Centre, Ontario farm. Not everything works, he shares, pointing to a later-than-intended planting of a cover crop that didn't have enough time to grow into a canopy before winter. The

result was damaging wind erosion the following spring – something he took in stride as a lesson, not a failure.

Years ago, he started utilizing the biofumigant properties of mustards as a control agent for nematodes. And he's expanded on that knowledge with additional species. In the spring, he sows mustards and oilseed radish as soon as the frost leaves the ground, followed by pearl millet in late May. Forage peas, vetch and tillage radish can be added in either spring or fall.

Each species has a role to play. Pearl millet, for example, builds organic matter and is a non-host for nematodes. Vetch and forage peas fix nitrogen. Barley, oats and rye build organic matter. Oilseed radish and tillage radish, have similar-looking leaves that look the same above ground, but they perform differently below ground. Oilseed radish, with its fibrous root, acts as a nematode suppressant whereas tillage radish, with its long tap root, opens up the soil.

"Clovers don't do so well on our land," says Emre. "We continue to learn and the fact is they often burn on our sandy soils in hot weather."

By summer time, the cover crop is buzzing with bees and ready for mowing down. It's then plowed under as a green manure. Volunteer potato plants have been a problem in recent years, so Emre plans to experiment with no-till in 2024 to see if that practice is beneficial.

As he continues to learn with his son-in-law Nick Bell, he's most proud of how the long-range plan is working. He observes, "Our potatoes have more shine on the skin and this is a quality that retail consumers appreciate."

Cover cropping is expensive in view of the specialized equipment, the cost of seed, drilling and plowing down, as well as foregoing a cash crop. But to not feed the soil is to mine the soil, an unsustainable practice over time.

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The future of potato breeding PG 8

Soil health and crop nutrition PG 16

AT PRESS TIME...

Loblaw announces Small Supplier Program

Canada's leading grocery retailer is introducing a new Small Supplier Program, providing additional support and resources to more than a thousand existing Canadian growers, bakers, vintners, and local product creators, and making it easier for new suppliers to work with Loblaw.

Launching January 2024, this program is designed to empower and support new and existing small suppliers, helping their businesses thrive and reach more customers through Loblaw's stores. By providing faster payments, streamlined processes, a six-month guaranteed listing period and top-notch support.

Key highlights of Loblaw's Small Supplier Program include: 1. **Faster Payments:** Loblaw will reduce payment terms to up to a maximum of seven days for new and existing small suppliers. This improvement will enhance cash flow for suppliers, enabling them to reinvest in their businesses as they see fit. This change will especially support our farmer partners and the unique challenges of managing the growing season.

2. **Dedicated Small Supplier Support:** Loblaw wants to give its small suppliers the support they need to succeed. This new approach will include dedicated team members at Loblaw's office and regionally, as well as training and resources to help small suppliers thrive.



3. **Assistance for Small Suppliers:** The process of getting products on retailer shelves can be complicated. Loblaw is committed to making this easier for small suppliers, including adjustments to supply chain programs and subsidizing retail industry fees to provide small suppliers with an opportunity to progressively stabilize and grow more effectively.

4. **Six-month guaranteed listing period for new small suppliers:** Building and growing a solid customer base can take time, which is why Loblaw's new program provides a six-month on-shelf commitment, while waiving associated listing fees, giving new suppliers the opportunity to test their products with greater ease.

"The fresh fruit and vegetable industry is a fast-paced business environment which represents many small local growers and business owners," said Ron Lemaire, president, Canadian Produce Marketing Association. "Providing these small businesses with the opportunity to access the market using this program can be a catalyst to their success."

Questions about the program?

Email: smallsupplier@loblaw.ca

Source: Loblaw November 14, 2023 news release

Two grocers release financial results

Metro Inc. reported a fourth-quarter profit of \$222.2 million, up from \$168.7 million in the same quarter last year.

Adjusted net earnings were \$228.8 million, up 4.3%.

Metro says a five-week strike at 27 stores in the Greater Toronto Area during the quarter had a negative impact on its bottom line of about \$27 million after taxes. Loblaw Cos. Ltd. reported its third-quarter profit and revenue rose compared with a year ago.

The parent company of Loblaw's and Shoppers Drug Mart reported a profit available to common shareholders of \$621 million or \$1.95 per diluted share for the 16-week period ended Oct. 7.

The result compared with a profit of \$556 million or \$1.69 per diluted share in the same quarter a year earlier.

Revenue for the quarter totalled \$18.27 billion, up from \$17.39 billion in the same quarter last year.

The increase came as food retail same-store sales rose 4.5 per cent and drug retail same-store sales gained 4.6 per cent, helped by front store same-store sales growth of 1.8 per cent and pharmacy same-store sales growth of 7.4 per cent.

NEWSMAKERS

Congratulations to **Ontario Fruit & Vegetable Growers' Association** and **Farm & Food Care Ontario** for winning Best Blog at the 2023 Canadian Agri-food Marketers' Alliance awards. It's in recognition of the More than a Migrant Worker program and its positive story-telling of 200-plus workers since 2021.



Seven lifelong Canadian agriculture ambassadors from across the country were formally inducted into the Canadian Agricultural Hall of Fame on November 4 at a ceremony in Charlottetown, Prince Edward Island. The 2023 inductees are **Garnet Altwasser, John Bragg, Rory Francis, Marcel Groleau, Ron Helwer, Robert K. Irving** and **Ray Robertson**.

John Bragg is the dominant force in the evolution of the wild blueberry industry in the Maritimes. At Bragg Foods Group, he built the sector from a cottage industry to the high-tech, export-driven sector it is today. His visionary leadership saw expanded production, a focus on research and development, new export markets and innovation in processing. John Bragg lives in Collingwood, NS and was nominated by **Honourable Greg Morrow**, Nova Scotia Minister of Agriculture.



Robert K. Irving's agricultural legacy began when he established Cavendish Farms in 1980, a frozen food plant in PEI that created a local opportunity for processing and value-added agriculture. Cavendish is now the fourth largest producer of frozen French fry products in North America. Irving also heads Cavendish Ag Services – an agricultural inputs and services company. Robert Irving lives in Dieppe, NB and was nominated by Potato Growers of Alberta. For more information on these inductees, visit www.cahfa.com

The Ontario Produce Marketing Association has appointed **Michelle Broom** as interim president, as a result of the resignation of **Stephen Reid** effective November 17, 2023. The board is undertaking a hiring process for a full-time president.

Congratulations to **Dr. Rose Buitenhuis**, director, biological crop protection, Vineland Research and Innovation Centre. She's one of 14 Excellence in Agriculture award winners recognized by the Ontario Ministry of Agriculture, Food & Rural Affairs. For details on all winners, link here: www.ontario.ca/page/2023-excellence-agriculture-award-recipients#section-3



Dr. Rose Buitenhuis

The 44th Annual Wine Tasting event was held on October 25 at Queen's Park in Ontario. Congratulations to the winery owners of the official wines of Ontario's Legislative Assembly for 2024. Red Wine: 2020 Cabernet by King and Victoria Winery, owned by **Rob and Liz Harold** and **Joe and Tracey Schenk**. White Wine: 2021 Chardonnay by Watchful Eye Winery owned by **Kate and Will George**.

Agriculture in the Classroom Canada (AITC-C) welcomed **Mathieu Rouleau** as executive director effective November 6. Based in Québec, Rouleau brings a combination of leadership, agriculture and finance experience to the role. While working in the finance sector, he co-founded École-O-Champ, a non-profit organization dedicated to agricultural education and AITC-C's member organization in Québec. With a background deeply rooted in agriculture, Rouleau grew up on a dairy, cash crop and maple syrup farm and holds a Bachelor in Agricultural Economics, Agricultural Business and Agronomy from McGill University.

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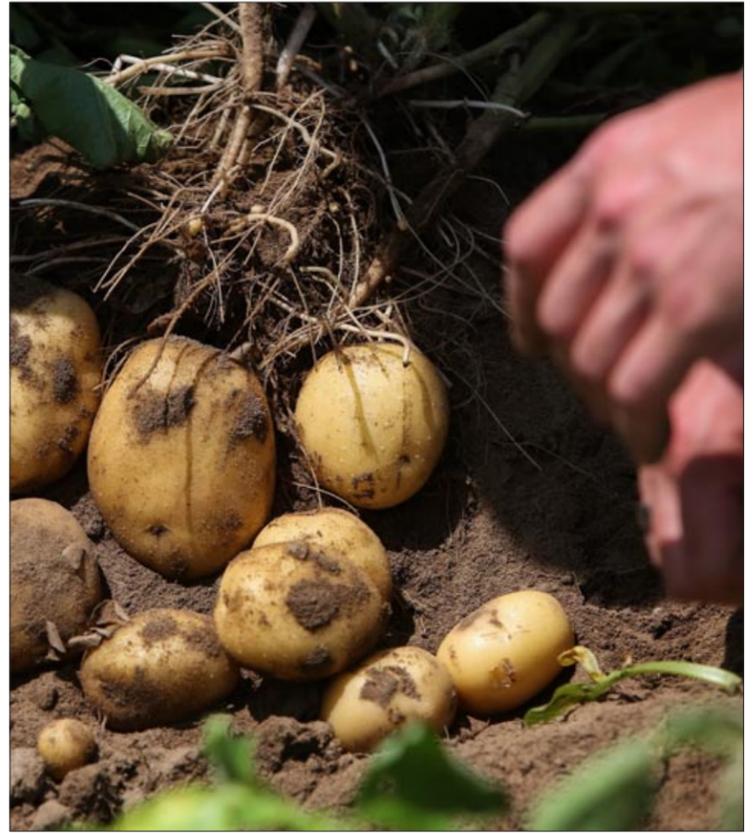
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COVER STORY

En route to building soil wealth



Cover crop mixtures should be tailored for specific soils, local conditions and end goals. For Charles Emre, this cover crop mixture has worked well: oilseed radish, forage peas, oats, common vetch and pearl millet. Some volunteer rye is poking through in this sample. Photos by Glenn Lowson.



Potatoes are sizing nicely as of July 14, 2023.



We've improved the organic matter by 0.1 per cent and that's a big victory.

~ CHARLES EMRE

Continued from page 1

Forty years ago, Senator Herb Sparrow and his agriculture committee issued a report titled "Soil at Risk: Canada's eroding future." Since then, climate change has further impacted soil health, an issue that's being championed today by Senator Robert Black. He's chair of the Standing Senate Committee on Agriculture and Forestry which has heard from 100-plus witnesses on the status of soil health in Canada. Several key themes have emerged from the committee's findings.

Soil health and climate change are linked

Erosion during weather events, changing rainfall patterns and hotter temperatures all affect soil health. Canadian horticulture is being affected from coast to coast. The atmospheric river in British Columbia in November 2021 was felt hardest in the Fraser Valley. Deluges of rain ruined vegetable and fruit crops along Québec's St Lawrence basin during the summer of 2023. The Maritimes experienced its warmest July ever in 2023. And Taber, Alberta, the heart of potato country, broke heat records on August 14, 2023 with a temperature of 36.6°C.

Confronting such gloom, Croptimistic Technology Inc has developed proprietary soil mapping tools that track electrical conductivity to water flow paths

and topographic elements. This technology is already in use in Prince Edward Island potato fields according to CEO Cory Willness based in Saskatoon. In a bit of clever branding, he has aptly named his mapping system as Soil Water and Topography (SWAT).

Too often, the issues of soil health and water health have lived in silos. But as Senator Black has noted, "The impact of soil stressors affects our ability to access food, the quality of our water and ecosystems, and the livelihoods of many Canadians."

In a timely publication in October 2023, the Canadian Agri-food Policy Institute (CAPI) released "A National Agri-Food Water Action Plan." The report's authors, Tyler McCann and Angèle Poirier, write, "Whether it's the boundary waters of the Great Lakes, Lake Champlain, the St. Lawrence River, or the great rivers that flow from the Rockies into the Prairies, all agronomists and experts agree that water quality is linked to soil health. Healthy soil is like an athlete. It doesn't need constant medication in order to perform."

These voices and others will play an increasingly vital role in calling attention to the importance and benefits of improving Canada's soil and water health.

The Grower is "Digging Deeper" with Senator Robert Black, chair of the Standing Senate Committee on

Agriculture and Forestry. For the last year, he's crisscrossed Canada gathering input from farmers and experts on the status of soil health and its role in the ecosystem of a healthy agri-food economy. He attended the FAO-

sponsored Global Soil Partnership Plenary Assembly in Rome in July 2023. He shares the emerging themes that can be expected in the Senate's report in early 2024. This podcast is sponsored by Cohort Wholesale.



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CROSS COUNTRY DIGEST

BRITISH COLUMBIA/PRINCE EDWARD ISLAND

Canada's young farmers are outstanding in their field



Brad and Travis Hopcott, Pitt Meadows, British Columbia.

Canada's Outstanding Young Farmer national event was held in Laval Québec from November 22-26. At press time, the ultimate winners were not known. Nevertheless, **The Grower** is celebrating regional winners from the horticultural field.

The British Columbia/Yukon region was represented by brothers Brad and Travis Hopcott, Pitt Meadows. Together with their parents and sister Jenn, they operate Hopcott Farms located less than 40 minutes from downtown Vancouver. What began as a dairy farm became a



Marijke Oudshoorn and Willem van de Wetering of Spud Isle Farms, Prince Edward Island.

feedlot in 1957, which Brad now manages. After one year of composting the manure produced on the farm, it is sold to the public. Because they sell 70 per cent of their meat production through their retail store, which sister Jenn manages, Hopcott Farms built a \$5 million abattoir in 2022 to reduce their processing costs.

In 1996, the farm entered a partnership with Ocean Spray to produce 72 acres of cranberries. Travis Hopcott, manager of that operation, hosts harvest tours to the public in six different languages.

Hopcott Farms expanded its retail sales when the store was increased to 15000 sq ft in 2015. Brad & Travis believe quality and transparency are key to their business and especially when dealing with their 80 employees from around the world.

The Atlantic region was represented by new potato producers Marijke Oudshoorn and Willem van de Wetering of Spud Isle Farms located at Morell Prince Edward Island.

Will and Marijke both grew up in Holland on dairy farms. The two met in Ontario and shared a passion for the agriculture industry. Marijke went to Ridgeway College and Olds College and received her Agriculture Business Degree. Will worked at a John Deere dealership in Ontario and received his mechanic red seal.

With zero potato production knowledge, they moved to PEI in 2017. Marijke and Willem want to extend cover cropping to two years between potato production years and hope to try new potato varieties that will withstand adverse weather events better and grow with less fertilizer.

In the future, Marijke and Willem want to diversify and try different crops to become more self-sufficient. They will strive to improve equipment and expand storage capacity.

Canada's Outstanding Young Farmer competition is currently accepting nominations for 2024. You must be between the ages of 18 and 39.

CANADA

Canadian produce industry advocates for affordable food

The Canadian produce industry met with Prime Minister Justin Trudeau at the Asia Pacific Economic Cooperation (APEC) Summit held mid-November 2023 in San Francisco.

The Canadian Produce Marketing Association (CPMA), represented by Colin Chapdelaine, CPMA chair and president of berry operations at

Star Produce, spoke during Prime Minister Trudeau's food affordability roundtable.

The industry outlined concerns with the Canadian government's proposed regulations which could adversely impact food affordability and availability. These include the ban on fresh produce PLU stickers and the application of highly restrictive

and market-disrupting fresh produce packaging targets within the proposed Pollution Prevention Plan Notice for Primary Food Packaging. This complements CPMA's significant advocacy with Parliamentarians, the offices of the Prime Minister, Minister of Environment and Climate Change Canada, Minister of Agriculture and



PM Justin Trudeau and Colin Chapdelaine, chair, Canadian Produce Marketing Association.

Agri-Food, Minister of Innovation, Science and Economic Development Canada, and all levels of public service since the announcement of regulations and policy related to fresh fruit and vegetable packaging.

The industry highlighted the need for the Government to recognize and support its ongoing efforts and significant investments to address environmental concerns with produce packaging including, light-weighting, innovative packaging elimination, converting to fully recyclable packaging, increasing recycled content, and adopting compostable solutions.

"Our industry stakeholders from across the global fresh produce supply chain are ready to work with government officials to help them understand the industry's efforts to provide Canadians with affordable fresh produce, support industry efforts to develop and adopt sustainable packaging technologies, and fight the rising costs of food," says

Colin Chapdelaine, CPMA chair.

"Canadians are concerned about growing food prices," says Ron Lemaire, CPMA president. "The Canadian fresh produce industry is aggressively working to make sure healthy food remains affordable and available in all regions of the country - from major urban centers to remote and rural communities."

Given the Federal Court of Canada's decision on November 16, 2023, declaring the cabinet order enabling the ban of single-use plastics "unreasonable and unconstitutional," Canada's fresh produce industry is calling on the Canadian government to take a non-regulatory approach and work hand-in-hand with the industry to leverage its existing sustainable packaging efforts and help support a global approach to accelerate the development of the portfolio of sustainable packaging solutions and technologies.

Source: CPMA November 20, 2023 news release

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CROSS COUNTRY DIGEST

CANADA

Record 2023 potato yields in Canada despite weather pressures

VICTORIA STAMPER

Despite very challenging weather conditions throughout the growing season, Canada's potato production is expected to increase this year, to an estimated 126,851,000 cwt, a record level for the country. Despite some decreases in the east, fresh sector potatoes should be readily available for domestic markets as pricing pressure due to oversupply in the Pacific Northwest continues to impact our exports to the U.S.

Since the official Canadian Potato Production Estimate will not be released by Statistics Canada until December 7, 2023, we will provide some general observations and estimates on supply produced from this year's potato crop across the country. Here's the breakdown.

The overall crop in Canada is expected to be up approximately 3.9 million hundred weight (3.2%) over 2022 levels. With harvest now complete, we have revised our forecast. Based on better weather for harvest in October for the eastern provinces, with the exception of PEI in the latter half of the month, and despite some processing acres abandoned in the west, we feel overall production will be approximately 126,851,000 cwt, the highest ever for the country and an indication of a good growing season for most with improved yields over 2022.

Abandoned acres, based on harvested acre projections, are estimated to be approximately 11,994; a decrease of almost seven per cent from last year's 12,882 acres, but completely different in terms of regions; in the 2022 crop there were more lost acres in the west due to the very wet and cold spring for Manitoba and BC and near drought conditions in Alberta. This year, the heavy rains hit Ontario, PEI, New Brunswick and particularly Québec where we saw the largest abandonment numbers for 2023 based on weather conditions; the other large losses would be in Alberta and Manitoba out of the processing crop.

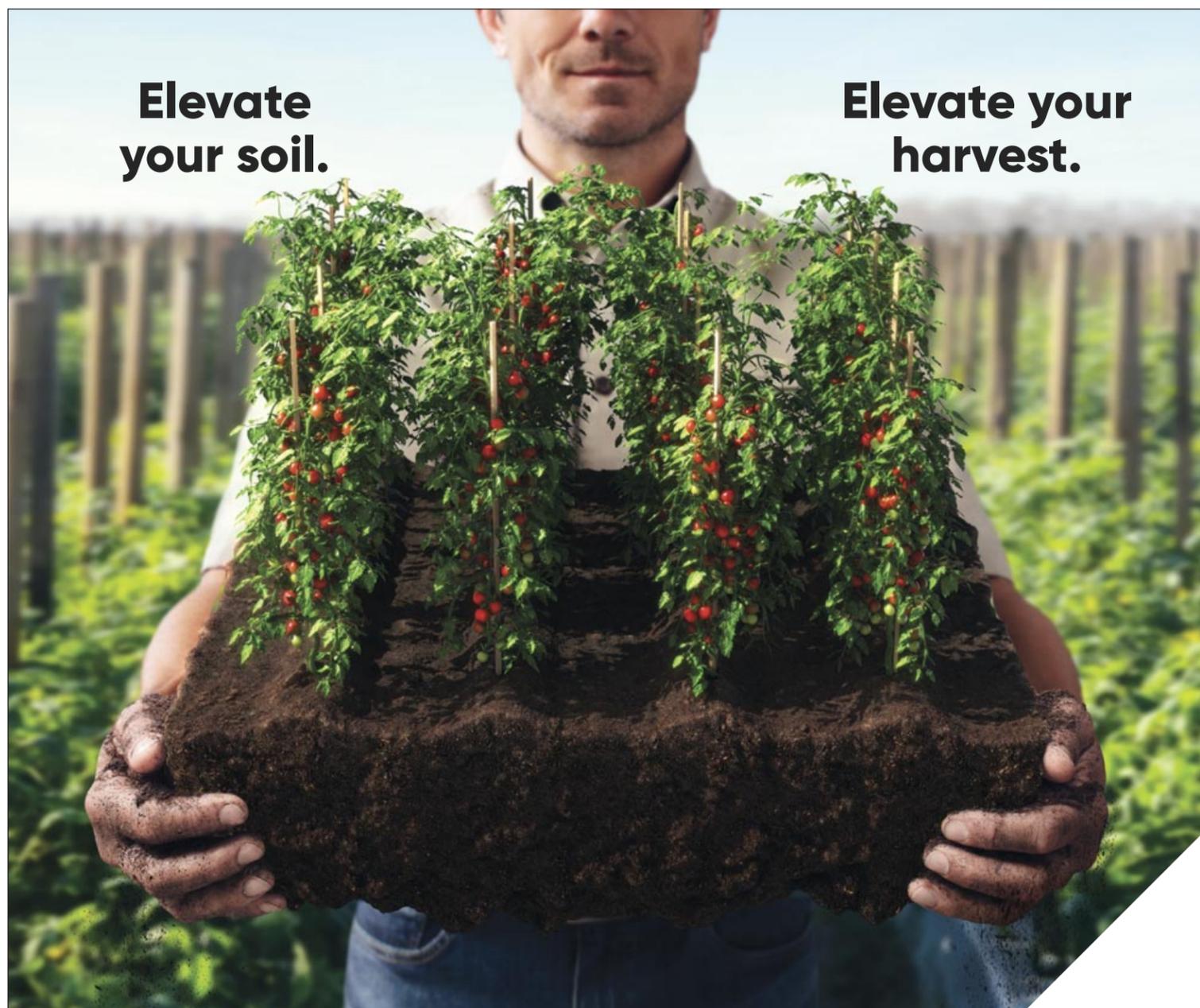
Excess heat and near drought-like conditions hit Manitoba this year, a complete about face from the floods of the prior spring. Despite these high temperatures and dry conditions, irrigation through the processing sector and through some of the fresh fields have improved yields greatly in the province, with overall averages expected in the 355 cwt/acre range. Processing growers have unfortunately had to disc under close to 2000 acres due to over supply in the Pacific Northwest and damage due to earlier hailstorms. Harvest went

very well in the province and growers are reporting a very good crop heading into storage.

Despite near drought-like conditions once again in Alberta this summer, their crop was excellent, up almost 17 per cent to a record 31,200 million cwt estimated production this year.

Victoria Stamper is general manager, United Potato Growers of Canada.

PROVINCE	Planted Acreage	ESTIMATED			PRODUCTION COMPARISON		
		Harvested Acreage	Yield	Production ('000 cwt)	2023 VS. 2022	2022	2021
PEI	83,500	82,000	315	25,830	-2.9%	26,600	27,209
NEW BRUNSWICK	53,000	50,000	295	14,500	-14.7%	17,000	18,200
NOVA SCOTIA	800	776	300	233	-3.0%	240	357
NEWFOUNDLAND	425	392	150	59	13.1%	52	55
TOTAL MARITIMES	137,725	133,168		40,622	-7.5%	43,892	45,821
QUEBEC	47,197	44,000	290	13,420	-9.6%	14,844	14,100
ONTARIO	37,700	37,400	225	8,415	3.1%	8,160	8,953
MANITOBA	81,000	79,901	372	29,723	13.7%	26,139	24,024
SASKATCHEWAN	7,300	7,285	235	1,712	18.1%	1,450	1,519
ALBERTA	80,000	78,000	405	31,200	16.4%	26,813	24,614
TOTAL PRAIRIES	168,300	165,186		62,635	15.1%	54,402	50,157
BRITISH COLUMBIA	5,200	5,174	340	1,759	9.9%	1,600	2,080
TOTAL CANADA	396,922	384,928	330	126,851	3.2%	122,898	121,111



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GREENHOUSE GROWER

No-glue paper packaging now manufactured in Canada

KAREN DAVIDSON

Omnia Packaging, the Canadian subsidiary of the award-winning Italian manufacturing company “Gruppo Sunino” has opened a spacious facility in Canada. Its 100% recyclable, glue-free, mustang paper trays are now made in Guelph, Ontario – the university town that prides itself on sustainability initiatives.

As Andrea Ceri, chief operating officer, explained at the September 21st grand opening, Gruppo Sunino has been providing innovative food packaging for generations. Its expertise is in injection molded plastic products. But it's not enough to meet prospective clients at events in Europe and Asia where Sunino has its other industrial plants. The company wants to develop relationships in North America. And it made sense to be close to one of the group's historical clients in Brantford, Ontario.

Another incentive was that the Government of Canada, FedDev, provided \$3.7 million to help Omnia Packaging purchase new



equipment for Canadian-made, 100% compostable and recyclable paper trays and 100% recyclable plastic packaging containers for the food, dairy and confectionary industry.

The paper division produces glue-free paper trays that can replace top-sealed polyethylene terephthalate (PET) trays, without changing existing equipment. These recyclable trays can be used for fruit and vegetable produce such as strawberries, blueberries, snack tomatoes, mini cucumbers, mushrooms and more.

“Every grower is having to decide between paper and plastic,” says Ceri. “And we understand it's a matter of cost. But plastic is over for some products. If plastic is not recyclable as it should be, then it's not green.”

The no-glue mustard tray is a big step forward with its compatibility with top-sealing machines. Paper is printable. And die-cuts can be made to see through to the product. Canadian organic growers now have access to completely organic packaging, something that's been



available in Europe for three years now.

Of particular interest is the reinforcement of the corners of the mustard tray, shaped in a way that gives sturdiness to the punnet. A water-based lacquer combined with a thermo-sealing process has been patented to achieve this result.

Ceri explains that virgin paper is used because its longer fibres give more strength to the tray and the fresh produce is preserved by the most uncontaminated material available. The result is longer

shelf life. The package is resistant to moisture in a refrigerator.

“Some of the best virgin paper in the world is sourced in Finland and Chile,” says Ceri. “The thermo-sealing process is helping produce a very clean paper surface, not conducive to mold.”

“We're ready to run the tests now in Canada” says Monica Viazzo, Omnia Packaging business development and marketing. “We need to start now for the next 20 years.”

Grodan and Signify to collaborate on low-energy tomato growing

Grodan, known for its sustainable stone wool growing media solutions and Signify, a leader in lighting, are working together at Botany, the Netherlands, to further refine tomato cultivation strategy.

The trial, started in September 2023 will explore principles of low-energy growing under fully dimmable Philips LED lights. Focus will be on plant transpiration and nutrient uptake in a 260 m2 department fitted

with active air de-humidification. This year's strategy is built on the knowledge gained from last year's successful tomato trial by Signify. By modelling the expected crop development and performance, both Grodan and Signify expect

to reduce up to 40 per cent on heat input by dimming the lights based on crop needs, energy prices, and outside light conditions.

“Collaborating with the right partner can take research to new heights, and we at Signify are excited to collaborate in this journey with Grodan. After conducting successful trials over the lighting season 2022, in which we focused on light scheduling and -spectra, we realized more needed to be done to define how an LED-winter crop could be grown five years from now. This trial will serve as a showcase for the Benelux market,” said Erik Stappers, plant specialist vegetables & fruit at Signify. “The combination of two irrigation treatments and the application of active dehumidification will give lots of information on how plants perform and can be steered in these conditions. We know that this way is not common practice yet, but we see a clear need for more proof points and knowledge for our customers on how to reduce the heat-input in LED crops. Our goal is to save 40 per cent on heat-input compared to current practice.”

The tomato variety chosen for the trial in 2023 is the ToBRFV-resistant cherry-on-the-vine cv Vitalion from BASF Vegetable Seeds. Dimmable Philips GreenPower LED toplighting compact will be controlled by Ridder Climate computer. Nutrient and uptake analysis will

be undertaken by Normec Groen Agro Control. Sensors from Wireless value will be used to understand and determine the impact on plant growth. Finally, Grodan slabs and GroSens sensors were installed to collect data and optimise the irrigation strategy.

“Grodan understands that low-energy growing is not a trend but is now the norm and new growing solutions are required to ensure we continue to produce high yields of high-quality fruit,” said Andrew Lee, knowledge manager at Grodan. “We have lower pipe temperatures, less energy input and with the LED lights 40 per cent less radiant heat. All this adds up to lower transpiration levels in the crop, especially in the winter months.

We must adjust root zone management strategies and monitor in more detail when. Not just irrigation start and stop times and the electrical conductivity of the irrigation water but also the balance of the different nutrient elements. We are confident these new trials will not only highlight the importance of root zone management in low-energy growing, but will also lead to new ways to improve cultivation practices which ultimately improve our customers' bottom line to increase efficiency and profitability.”

Source: Grodan & Signify October 30, 2023 news release



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GREENHOUSE GROWER

What is the true cost of an injury?

Greenhouses are pretty great places to work. When you have team members that enjoy their jobs, work well together, and get things done, business is good. But, if a member of your team suffers an injury, that all changes.

“An injury impacts the entire workplace,” says Kristin Hoffman, health and safety consultant with Workplace Safety and Prevention Services (WSPS). “When someone gets hurt at work, it really shakes the foundation of employee morale, and then engagement drops.”

Kristin Hoffman has been working with Ontario greenhouse growers for more than 16 years, helping to improve health and safety practices. She has seen what happens when a worker gets hurt.

“Of course, we know that there are costs when an incident occurs. Those costs may include property damage and repair, loss of product, and insurance claims. They may also include lost productivity if work needs to be stopped, but these costs are only one side of it,” she explains. “The impact that an injury or fatality has on your people can be more significant and last much longer than the costs of the actual injury.”

When someone suffers a critical injury at work, it brings devastation to their life, uncertainty and upheaval to their loved ones, and leaves their co-workers and community trying to understand how it could have happened. “When a worker

witnesses their friend get injured, how do you think that worker feels about coming to work the next day?” asks Hoffman. “Or when you have to shut down production because the Ministry of Labour, Immigration, Training, and Skills Development (MLITSD) is coming to investigate, how might that make the rest of your employees feel about their job? Your customers may also start to view your company very differently.”

Falls and MSDs are still among top hazards

When the greenhouse sector participated in the MLITSD’s risk assessment and root-cause analysis initiative back in 2015, worker and management representatives came together to identify the top 10 hazards faced by greenhouse workers. “The hazards that were identified then are still the most common hazards in greenhouses today. Falls from heights and slips/trips on the same level are at the top of the list,” says Hoffman.

Fixing or replacing glass panels and lighting on the greenhouses is an example of a task that requires people to work at heights. Tripping on a hose or slipping on a puddle of water are also common causes of injury.

“Getting caught in equipment—such as augers, conveyors, and fans—is also on the list,” says Hoffman. Safe work procedures



and proper training are the best way to prevent injuries involving specialized equipment. She also highlights that the repetitive nature of greenhouse work continues to lead to musculoskeletal disorders (MSDs).

“Greenhouse work involves a lot of pushing, pulling and lifting,” says Hoffman. Experiencing chronic pain from an MSD may not be as traumatic as seeing someone fall from the roof, but the effect on employee morale is the same. Employees become disengaged and eventually leave the job—either they are forced to because they can no longer perform the task due to pain or they find another place to work that does a better job of managing MSD hazards.

“Recruiting, training, and retaining workers can be expensive,” says Hoffman. “People are at the centre of a successful business. And an investment in health and safety is an investment in your people.”

Join Kristin Hoffman at the Greenhouse Health and Safety Symposium in Leamington on January 30, 2024 to gain a better understanding of the legislation and your responsibilities as a greenhouse operator. When you know how to recognize and control the risks in your workplace, you will be able to protect your people.

To register for the symposium, link here: [About Us | Greenhouse Health and Safety Symposium 2024 | WSPS \(eventsair.com\)](#)

Nature Fresh Farms announces California production expansion

Nature Fresh Farms, headquartered in Leamington, Ontario, is expanding production to the west coast, partnering with grower Millennium Pacific to bring California-grown Hiiros tomatoes to the market.

“We’re always looking for ways to improve our efficiencies, maximize sustainability efforts, and bring consumers high flavour, high-quality produce

that’s grown closer to home,” explains Niels Klapwijk, vice president, procurement, Nature Fresh Farms Sales. “Onboarding Millennium Pacific as a partner grower with Nature Fresh Farms allows us to do this.”

With the expansion of production to the west coast, Nature Fresh Farms will first introduce conventional California-grown Hiiros tomatoes

to market, with further expansion into organics, and commodities including peppers and cucumbers on the horizon.

“Our partner growers are an extension of Nature Fresh Farms, our standards, and our commitment to retailers and consumers,” said Frank Neufeld, executive vice president, Nature Fresh Farms, adding that the company is excited to bring fresh, local,

flavourful produce to west coast shelves and tables in a fast, sustainable manner.

California-grown Hiiros tomatoes are already in production and available at select retail locations in the west coast.

“As our business continues to expand, so too will our footprint; helping us to ensure that through our growth, our commitment to service and quality standards are



never lost,” promises Neufeld.

Source: *Nature Fresh Farms November 17, 2023 news release*

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POTATO PRODUCTION

Why diploid breeding matters to the future of potatoes



In Sanya, Hainan, China on October 27, 2023. L-R: Jianmin Xie of CIP China; Dr. Peter Vander Zaag; Dr Sanwen Huang; Dr Simon Heck, director general of CIP Peru and Dr Telesphore Ngabamenye of Rwanda Agriculture Board.



L-R: Dr. Peter Vander Zaag and Dr. Sanwen Huang.

KAREN DAVIDSON

Sanwen Huang is not a household name but will be as the president of the Agriculture Genomics Institute of Shenzhen, which harnesses an international team to breed hybrid potatoes. His lab team has been studying the genetics of a tetraploid potato with four copies of each chromosome. The revolution they hope to start is the diploid breeding method, using just two sets of chromosomes.

To date, the hurdle in diploid inbreeding is that the potato can't produce true potato seed when pollen from an individual plant is placed on the flowers of the same plant. Self-compatibility is needed in order to make the

plants as homozygous as possible through inbreeding or selfing up to seven times.

As the *China Daily* reported earlier this year, the research team aims to transform potato reproduction from asexual to sexual, and from reliance on tubers to reliance on seeds, and guide potato breeding by using genomics and synthetic biology.

Their progress has evolved to the point that the Global Hybrid Diploid Potato Alliance was announced in October 2023 in China. Partners include the International Potato Center (CIP) in Peru, Rwanda and Kenya. Other African countries are expected to follow soon.

Why China is leading diploid research

China is the world's largest grower of rice – and -- potatoes. The Food and Agriculture Organization reported that the country produced 78 million tonnes of potatoes in 2020, eclipsing India and Ukraine, second and third respectively. The tuber is relatively easy to grow, with the added benefits of being an almost complete food and producing a high number of calories per acre. In a country that needs to feed more than 1.425 billion people, the potato has risen in priority for research. Extreme weather is adding more pressure to increase productivity of potatoes.

Continued on next page



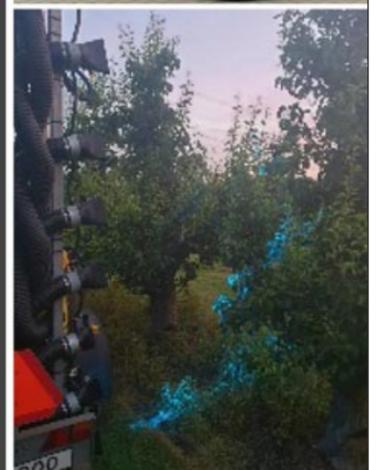
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POTATO PRODUCTION

Why diploid breeding matters to the future of potatoes

Continued from page 8

The first clue to Sanwen Huang’s global network of like-minded researchers is that he graduated in 2005 with a PhD in plant breeding from the Netherlands Wageningen University. Since then, he’s worked with researchers such as Dr. Peter Vander Zaag, president of the World Potato Congress and a Canadian potato breeder in his own right.

Since the Russet Burbank potato was introduced in 1902, not much has changed with the genetics explains Vander Zaag. The history of corn, for example, has had a different trajectory. He explains that hybrid corn has increased yield by about two per cent every year since the 1950s. Potatoes, meanwhile, are stuck in a productivity rut without new breeding approaches.

Canada’s own researchers have been working on the puzzle for decades, including Dr. Henry De Jong, who retired from the federal agricultural research centre in Fredericton in 2001. His research has combined diploid cultivated and wild *Solanum* species that are suited to Canada’s long days and short seasons. As part of ongoing research, he continues to impart his wisdom at meetings in China.

What’s the goal of hybrid potatoes?

With Chinese government funds behind the surge in potato research, Chinese scientists are a formidable force.

Sanwen Huang declares, “We have launched The Ubiquitous Potato Plan which aims to transform potato from a clonally propagated, tetraploid crop to a seed propagated, diploid crop, using genomic-design breeding. Our long-term vision is to develop an international initiative that enables the supply of personalized food in a sustainable manner, which includes:

1) restoring phosphate use efficiency and understanding symbiotic nitrogen fixation, to enable the creation of environmentally friendly crops; 2) promoting personalized food, which requires a multidisciplinary team to identify human genes for food preference and metabolism, to reveal the interaction between gut metagenome and human genes, to design ethnic protocols to allow appropriate use of personal information on food and nutrition.

“Both of these goals are possible,” says Vander Zaag. “When I suggested to Sanwen Huang that 20 years is a doable timeline, he convinced me that at least part of the goal will be met in five years.”

This work brings to mind the

famous feats of Dr. Norman Borlaug, the father of the Green Revolution in wheat breeding that changed India into a wheat-exporting country. But it’s unlikely that international accolades will come to Sanwen Huang.

As Vander Zaag explains, Sanwen Huang leads large teams of people by employing excellent graduate students to continue the work. He has three offices and three jobs in China, including president of the Tropical Agriculture Institute in Hainan.

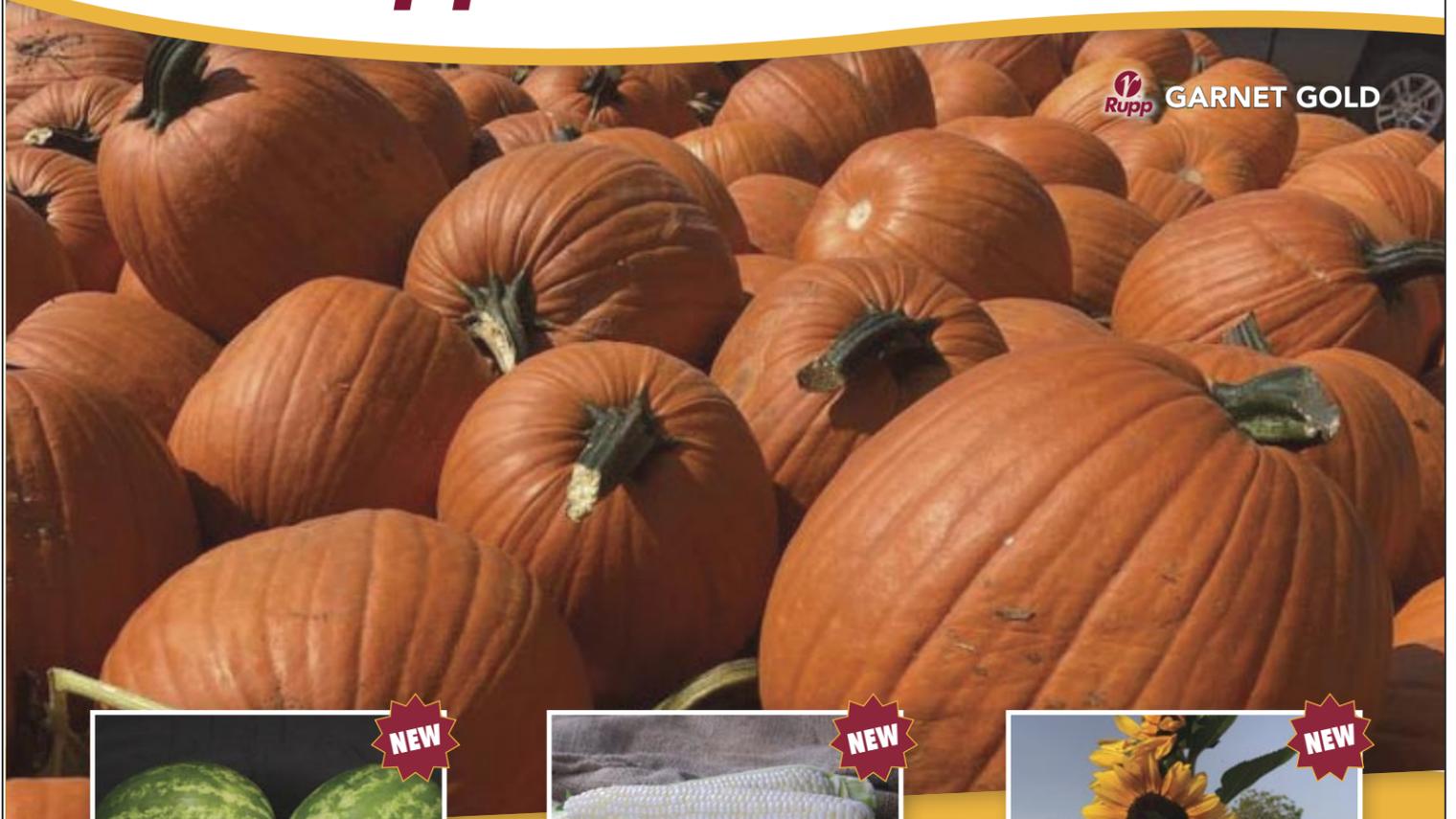
When Vander Zaag shared an academic platform with him in Sanya, Hainan, China on October 27, 2023, Huang shared an important point: ‘China invests so heavily in agricultural research simply because we don’t produce enough food to feed our population. So we must do more.’

Photo right: Dr. Peter Vander Zaag (left) and Dr. Henry De Jonge.



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RESOURCE MANAGEMENT

Water's worth: call to preserve Canada's agri-food future



The latest Canadian Agri-Food Policy Institute (CAPI) report recommends governments across Canada develop and release a National Agri-Food Water Action Plan (NAFWAP) by 2025. At the core of this plan should be a strategy for sustainably managing and leveraging water for the agri-food sector. The report further recommends that governments commit to ambitious outcomes, embrace shared responsibility, partner with stakeholders in agriculture and food, and prioritize this increasingly strategic, critical natural resource.

To lay the groundwork for effective water management, immediate action is required, including:

- Developing uniformity in data collection for both groundwater and surface water.
- The creation of a diverse expert panel to report on the state of agri-food water.
- Investment in mission-driven

research – to the tune of \$18 million – and infrastructure.

- Leveraging the watershed level as the basis of water management.

“Water will increasingly be a strategic asset that can be leveraged for the growth of agriculture and food in Canada, but it is essential that it be conserved and protected,” says Tyler McCann, managing director of CAPI and co-author of this report. “With increasing pressures in Canada and around the world we can no longer take water for granted.”

Today, management and stewardship of this vital resource should be prominent in growth, adoption and climate plans across levels of government.

The issues impacting the strategic management of water in Canada are global and multi-faceted, stemming from trade, governance and competition across industries.

Responsible water manage-

ment at all levels of government is essential to ensure that Canada remains among the top 10 agricultural producing and exporting countries, but a lack of leadership, systems approaches, and strategic thinking are significant roadblocks. The role and needs of the agri-food sector have been left out of existing legislation.

For CAPI distinguished fellow Nicolas Mesly, “Amid current climate and geopolitical change, water quality and quantity will redefine production and trade of agri-food products. It’s the challenge of the 21st century!” Hence the urgency for the country to adopt a National Agri-Food Water Action Plan.

A National Agri-Food Water Action Plan was developed by CAPI researchers in collaboration with distinguished fellow Nicolas Mesly. Interviews were conducted with government representatives, industry leaders, farmers, non-profit organizations, and

academia. CAPI offers this peer-reviewed report as a guide toward an action plan on agri-food water in Canada to better monitor and manage water, and to foster coordination between watersheds and other jurisdictions, looking to federal

leadership to sustainably harness Canada’s water resources and ensure the country’s viability as an agri-food producing nation.

The report is available for download at capi-icpa.ca.

COMING EVENTS 2023

- | | |
|--------------|---|
| Dec 5-7 | Great Lakes Expo, DeVos Place, Grand Rapids, MI |
| Dec 6 | Ontario Potato Board Annual General Meeting, Delta Hotel, Guelph, ON |
| Dec 13 | Fresh Vegetable Growers of Ontario Annual General Meeting, Springfield Golf Course, Guelph, ON |
| 2024 | |
| Jan 10-11 | Potato Expo, Austin, Texas |
| Jan 23-25 | Manitoba Potato Production Days, Keystone Centre, Brandon, MB |
| Jan 24-25 | Nova Scotia Fruit Growers' Association Annual Convention, Old Orchard Inn, Wolfville Ridge, NS |
| Jan 24-27 | Guelph Organic Conference, Guelph, ON |
| Jan 25-27 | Pacific Agriculture Show and Growers' Short Course, Tradex, Abbotsford, BC |
| Jan 28-31 | North American Strawberry Growers' Association Meeting & Conference, Hershey, PA |
| Jan 30 | Greenhouse Health & Safety Symposium, Best Western Leamington Hotel and Conference Centre, Leamington, ON |
| Jan 31-Feb 1 | CAPI: Canadian Agri-Food in a Sustainable World, Ottawa, ON |
| Feb 5-7 | Alberta Irrigation Districts Conference, Lethbridge, AB |
| Feb 5-9 | Global Minor Use Summit IV, Madrid, Spain |
| Feb 7-9 | Fruit Logistica, Berlin |
| Feb 11-14 | International Fruit Tree Association Annual Convention, Yakima, WA |
| Feb 16 | BC Cherry Association Annual General Meeting, 2 pm, Penticton Trade and Convention Center, Penticton, BC |
| Feb 16-17 | Southern Interior Horticultural Show, Penticton Trade & Convention Centre, Penticton, BC |
| Feb 20 | Ontario Fruit & Vegetable Growers' Association Annual General Meeting, Niagara Falls, ON |
| Feb 20 | Berry Growers of Ontario Annual General Meeting, Niagara Falls, ON |
| Feb 21 | British Columbia Fruit Growers' Association Annual General Meeting, Ramada Inn, Kelowna, BC |
| Feb 21-22 | Ontario Fruit & Vegetable Convention, Niagara Falls Convention Centre, Niagara Falls, ON |
| Feb 22-23 | International Potato Technology Expo, Eastlink Centre, Charlottetown, PE |



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CONSUMER OUTREACH

GO transit riders to see sustainability messaging



The Ontario Fruit and Vegetable Growers' Association has launched its first-ever GO train poster campaign in the Greater Toronto Area. The six-week campaign focuses on sustainability and spotlights all the hard work Ontario's fruit and vegetable growers have done for years regarding sustainable practices. These include work in areas such as crop protection, energy, water use and more.

The GO train presents an excellent opportunity to reach a large urban audience, introducing tools and technologies that help make fruit and vegetable production cleaner, greener and more cost effective than ever before.

The posters are slated for various GO Train lines, beginning November 1. The timing lines up with several events around the Greater Toronto Area, most notably the

Royal Agricultural Winter Fair, which runs November 3-12.

For more information, please visit www.ofvga.org/sustainability

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THE INNOVATION REPORT

CHAIR'S PERSPECTIVE

Relationship building key to improving grower access to labour

SHAWN BRENN &
BILL GEORGE

For growers, labour is one of – if not the – top priority issue fruit and vegetable farms deal with. This runs from keeping and expanding access to international worker programs to ever-evolving regulations governing employer obligations and worker experience.

At the 2023 annual general meeting of the Ontario Fruit & Vegetable Growers' Association (OFVGA), a resolution was passed directing us to explore new opportunities for Ontario farms to access reliable, high-quality offshore workers, such as from Central America and beyond.

Since then, we've been very active on this file and recently announced a pilot program with El Salvador for interested Ontario growers. Representatives from El Salvador will be in Ontario at the end of November to participate in grower information sessions in preparation for the 2024 growing season.

Just as important as making

connections with new countries is strengthening relationships with those countries who have been reliable partners to Ontario in the offshore worker programs for decades, such as Seasonal Agricultural Worker Program (SAWP) participants. This includes Jamaica, Trinidad and Tobago and several other Caribbean nations.

Every year, delegations from Jamaica and other Caribbean countries gather with senior officials from Employment and Social Development Canada (ESDC) and employers, who are represented by the Fruit & Vegetable Growers of Canada (FVGC).

Historically, all three major SAWP administrators – F.A.R.M.S from Ontario, FERME from Québec and the Western Agriculture Labour Initiative – have also been present. This year marked the first time that the OFVGA was also invited to send a delegation. This reflects Ontario's significance to the Caribbean SAWP program, accounting for approximately three quarters of SAWP hires from the region. The invite also aligned with the

direction of the OFVGA board received from our members to play a more active role in collaborating with FVGC in pursuing the interests of growers and our labour supply needs.

The two of us as OFVGA chair and OFVGA Labour Section chair attended, supported by OFVGA senior policy advisor Stefan Larrass.

The purpose of this large gathering every year is for delegates to discuss and reach consensus collectively on proposals that govern the contractual terms and conditions under which Caribbean SAWP participants work in Canada. These proposals vary annually, and may address policy issues such as wages, worker amenities, deductions for flights, internal program administration and more.

In some cases, delegates agree to study an issue further before making a decision the following year, and progress is reviewed at quarterly Zoom meetings of all parties. It was an interesting process to be part of and to observe how all discussions happen in a spirit of mutual respect and the goal of achieving

a win-win perspective. As well, this is part of an ongoing collaboration between all parties with proposals and decisions continually evolving to meet the needs of workers, employers and government.

For OFVGA, this was a tremendous opportunity to start building direct relationships with all the major parties in the Caribbean. We know how incredibly important SAWP and Temporary Foreign Worker (TFW) employees are to our farm businesses, but the TFW programs are also a key economic pillar for these Caribbean nations, and we share common goals in wanting them to be a success.

Relationships and mutual trust are essential for forming and maintaining effective partnerships, especially when it comes to communicating the benefits and win-win nature of SAWP to policy makers and the public. We're hoping, for example, that strengthening our relationships with our Caribbean partners could lead to better coordination and collaboration in raising awareness of the mutually beneficial nature of the program

and building on each other's existing activities and successes. This includes OFVGA's More than a Migrant Worker initiative.

More than a Migrant Worker was launched over two years ago here in Ontario to draw attention to the value of seasonal and temporary workers in fruit and vegetable production and to give those workers a chance to tell their stories in their own words.

Participating in this meeting also underscored the importance of collaborative and engaged policy input from the industry, and how this process sets the tone for the broader TFW program and supports the longevity of these programs for both source countries and Canada's fruit and vegetable industry.

We look forward to continuing to strengthen these relationships as we work to promote Ontario as a preferred destination for workers and the OFVGA as a trusted partner to ensure well-functioning processes and programs that work for our members.

Shawn Brenn is chair, OFVGA and Bill George is chair, OFVGA Labour Section.

WEATHER VANE



Greenhouse worker, Leroy Gregario, Jamaica, is a happy story-teller for the More Than a Migrant Worker program. The public relations initiative, led by the Ontario Fruit & Vegetable Growers' Association and Farm & Food Care Ontario, was honoured by the Canadian Agri-food Marketers' Alliance Best of CAMA Awards for Best Blog in 2023. Since the program's inception in 2021, about 200 workers from across Ontario have been interviewed with their stories featured in newspapers, on Facebook and Instagram. Link here: <https://www.morethanamigrantworker.ca/blog/>

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THE URBAN COWBOY

Soil: Out of the silo, into the spotlight



OWEN ROBERTS

agriculture are top of mind. Even in the face of everything else we have to worry about, soil health has a much better chance of drawing the public's attention and understanding, and perhaps even support.

Conversations and activities are happening globally. For example, in the U.K., researchers at the Game and Wildlife Research Trust are looking at research considering the role of soil in crop production in the round, from both a sustainable and profitability perspective. As researchers there point out, healthy soil represents a huge store of carbon. They say the top 30 cm. alone is thought to contain more than twice as much carbon as there is in carbon dioxide in the atmosphere.

They note that for every one

per cent increase in organic matter, the soil can hold more than 200,000 more litres of water per hectare.

And where soils are healthy, there can be a greater weight of earthworms living below ground than the livestock grazing above ground.

How's that for integration?

At the University of Illinois, I teach a course in international agricultural communications. Each week we virtually host an agricultural journalist from one of 60-plus countries associated with the International Federation of Agricultural Journalists (which includes Canada and the U.S.). Among other things, these journalists discuss challenges and opportunities in their countries.

Recently, the class heard from a journalist from Bangladesh. Soil



salinity, caused by monsoon storms dumping extraordinary rainfall on the land, has worsened with climate change.

Researchers are responding by prioritizing salinity-resistant crop development, acknowledging the importance of food security in this densely populated, disaster-prone nation. It's a big story there.

Soil in the round is a global

movement. Its development and sustainability will depend in part on public awareness and support. In modern times, the need has never been more obvious.

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

Photo by Glenn Lowson

Soil, once a supporting actor in agriculture, is finally finding its way to the spotlight. It hasn't quite made it to the red carpet yet, but integrated soil health and management are well on the way to getting top billing, even outside of agricultural circles.

And rightly so. Soil has long been considered in isolation, a solo act of sorts. But research underlines that soil must be viewed "in the round" – in other words, in relation to its interaction with water, climate and a host of variables that influence its performance and its ability to provide the food that keeps the world alive.

It's the latter point that has rocketed soil onto the front page. As soil health advocate Senator Rob Black noted in SenCA+ magazine in April, history has shown that civilizations grounded in healthy soil benefit from social, economic and political stability.

The key is how to keep soil healthy, and make its importance understood. That's not easy. But outside of the Dust Bowl from the Dirty Thirties, there may have never been a time when so many people were paying attention to soil.

Consider this. Almost 40 years ago, well before Black's time, the Canadian Senate released a visionary report called Soil At Risk: Canada's Eroding Future. The report certainly caught the eye of the farming sector. But in the excessive, self-indulgent '80s, it was easy for society to ignore dire warnings about almost anything, soil included.

The same with Alternative Land Use Services (ALUS), a network of more than 1,600 farmers and ranchers in nearly 40 communities across Canada. For years, ALUS program participants have been delivering ecosystem services, many of which are related to soil management -- sustainable drainage systems, erosion control and wetlands restoration, among them. Their efforts are admirable and deserve higher profile.

Maybe now they and others concerned with integrated soil health will get it. With inflated food prices and food insecurity a part of daily dinner table conversations, topics related to



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Sustainability needs to move from your radar to your 'to do' list



PETER CHAPMAN

Talking about sustainability is not new. This issue has been impacting our industry for several years. Consumers are concerned about our planet, your customers need to react and regulators are forcing change. The fresh produce industry has always been a major part of the conversation because in most stores it is the first thing people see and there has been a lot of single use plastic used to pack products. When people walk in the store and see displays full of plastic bags or clamshells, they demand action.

Most businesses have some form of initiatives related to sustainability. Many producers would have goals for the current

year and others have pushed this work further into the future. If you have not done so already, it is time to accelerate the effort in your business and move sustainability initiatives to the action list. Consumers are expecting it, your customers are doing it and regulators are demanding it.

Sustainability is a big and complicated issue. We believe in the food and beverage industry there are three areas to focus on: Packaging
Food waste
Environmental footprint

Significant changes to packaging

Packaging is the most visible opportunity to many consumers. They see it every week at the store and most would agree single-use plastic is a bad thing for the environment. It is probably the most complicated piece of the puzzle for fresh produce growers, packers and shippers. Changes to packaging impact equipment, cost, your process and in some cases increase food waste.

Environment Climate Change Canada (ECCC) released a pollution prevention (P2) planning

notice. As the document states, "The P2 Notice would set requirements for Canada's largest grocery retailers to prepare and implement a pollution prevention plan (P2 plan), with an aim towards zero plastic waste from primary food plastic packaging."

Once again, the regulators are putting the onus on the final link in the value chain to enforce the policy. There are many sections and details to absorb. The section that references fresh produce packaging is section 4.4 Objectives, targets and timelines. In this section under Risk Management is the following goal for fresh fruits and vegetables:

Objective 2

Fresh fruits and vegetables are distributed and sold in bulk and/or in plastic-free packaging
Targets:

- 75% by 2026
- 95% by 2028

In other words, by 2026, 75 per cent of produce sold in large retailers will need to be in bulk or plastic-free packaging. By 2028, 95 per cent of produce sold in large retailers will need to be in bulk or plastic-free packaging. I am not sure what the number is

today but it isn't close. When you consider the berry category alone there is a lot of plastic to deal with. This is a huge change in a short period of time. Not to mention that growers and packers are dealing with inflation and other challenges.

There are a number of implications for this objective. Food waste is one major issue. Although single-use plastic is bad for the landfill, it does protect fresh fruits and vegetables through the supply chain. Options will need to be introduced that deliver the same functionality but eliminate the plastic.

Another consideration is the sales that are built into our industry. In almost every case, retailers will sell more when products are in a bag, when compared to bulk. Some retailers such as Fortinos or Longo's do a great job with bulk, but most large grocery stores sell more volume when products are in bags.

Packing fresh fruits and vegetables is a challenging business to be in. Packers will need to source equipment that can handle different types of packaging such as cardboard or compostable bags. The magnitude of this change should not be

understated.

Some European countries such as France and Germany are also forcing change in their food industry. Growers, packers and shippers might find some solutions to explore in these markets. There is no doubt there is a lot of innovation happening, but it is always a benefit to see a finished product in a store as opposed to a concept from a packaging company. It is important to visit packers to see equipment working and understand any incremental costs for slower packing times or other factors to consider.

This policy change is not final yet and we will see more from ECCC after they review input from industry and other stakeholders. The Canadian Produce Marketing Association (CPMA) did deliver a very detailed and fact-based response to the P2 notice. The pace of change is one area where many people are concerned. It will be interesting to see if Environment Climate Change Canada will listen and implement a less aggressive timeline.

Continued on next page

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RETAIL NAVIGATOR

Sustainability needs to move from your radar to your 'to do' list

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Food waste is an opportunity in more ways than one

We know that +/- 30 per cent of food produced is not consumed. At every point in the value chain there are opportunities to reduce food waste. Some of these opportunities are in improved processes, reduced portion sizes in food service or package size in retail and some are even product specs and standards.

Consumers and your customers want to see the food waste reduced. Any initiatives you can implement to reduce food waste should be opportunities to tell the story.

Recently, Loblaw committed to achieve zero food waste in their stores by 2030. They will need to work with suppliers to achieve this objective. Innovation in packaging to improve shelf life and/or eliminate damaged product would be one example of where a supplier could contribute to Loblaw achieving this goal.

One factor to consider when reducing food waste, is that often it will result in an increase in marketable yield. If you are able

to sell the product instead of composting it, your business should be better off. Developing markets for smaller sizes or even convincing existing customers to take smaller sizes can lead to better sales and utilization of equipment.

When you are able to reduce food waste, remember to tell the story. Share the win with your customers and consumers. They do want to know what you are doing and it might not lead to a purchase right away but it all helps to build your brand and help your business.

Reducing your environmental footprint can also be an opportunity

Utilities, water, logistics, wasted packaging and fuel all cost money. Any reduction in these expense items usually will reduce your environmental footprint and save you some money.

Walmart is a business to monitor for this approach to reducing your environmental footprint. They make commitments like "We aspire to achieve zero waste in our operations globally, and we aim to achieve this by 2025 in four markets: Canada,



Japan, the U.K. and the U.S." This is definitely a win for the environment with a company the size of Walmart. It is also a win for Walmart because waste from their stores would be a significant expense. I am sure they are doing it for the right reason, but they also benefit on their profit and loss statement.

Often discussions with retailers were met with limited success if you proposed fewer frequent deliveries of bigger amounts. I might have argued about "fresh quality product" when I was in retail. I also probably received

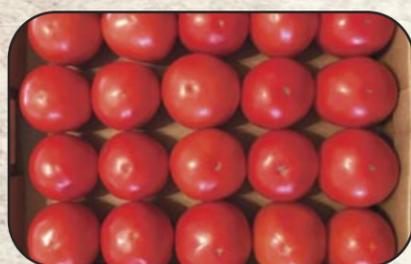
product packed from the same lot on the second delivery. Storage crops are an obvious example of this. If you preface the conversation with reducing the impact on the environment with fewer trucks or full trucks on the road, you might have a different conversation.

Find opportunities within your business to reduce your environmental footprint and your expenses.

Break down the initiatives in your business into realistic objectives. Look for opportunities to improve in packaging, food

waste and your environmental footprint. Your customers and consumers are expecting it and in some cases, regulators are demanding it.

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: SOIL HEALTH & CROP NUTRITION

Soil care: tillage, soil amendments, cover crops and nurse crops

DR. JUDITH NYIRANEZA

Potato production has been associated with environmental issues such as increased nitrogen leaching and soil degradation especially during the wet periods when ground cover and crops are absent. To address these issues, Agriculture and Agri-Food Canada (AAFC) scientists, in collaboration with academia, growers, and other industry professionals, have examined how various regenerative soil management practices, such as tillage and soil amendments (manure and compost) can enhance potato productivity and soil health, while reducing nitrate leaching. These results are from different trials initiated ten years ago and some of them are still going.

Tillage and soil amendment

Under the Living Laboratory Atlantic project, the team

compared primary non-inversion shallow tillage regime (PNIST), which leaves more crop residue on the soil surface, with conventional moldboard plow. Compared to moldboard plow, after only one growing season of adopting PNIST, the team found improvement in soil structure. By that, we mean that the soil was more stable and less prone to erosion. We also measured the amount of active carbon -- the fraction of soil carbon readily available as a food and energy for the soil microbial community -- as well as available nitrogen. While potato yields were comparable between the two tillage regimes, the PNIST helps enhance the environmental sustainability of potato production through improvements in soil health.

Adding manure and compost to the soil is another effective way to regenerate soil health. The team demonstrated that one single application of cow manure (using a moderate rate of 20 metric tons per hectare) increased

total and marketable potato yield by 28 and 26 per cent, respectively, and soil nitrogen supply by an average of 44 per cent.

When amounts of available conventional organic amendments are limited, producers can use alternative amendments. This team found that applying willow chips to the soils after potato harvest increased soil carbon and soil stability, making it less prone to erosion, and added potassium to the soil. They also discovered that willow chip application temporarily locked up (immobilized) residual soil nitrate after potato harvest during the first winter preventing it from leaching. Incorporation of willow chip increased soil biological activity and caused a greater demand for nitrogen (N) by soil microorganisms which explain reduced barley yield seeded in the following spring compared to the control treatment without willow chip. Therefore, the team recommend seeding a non-harvestable crop such forage legumes the season following willow chip application.

This research shows the benefits of switching to non-inversion shallow tillage and incorporating cow manure or shrub willow chips as effective ways to sustain or enhance soil health.

Cover crops

Potato plants require large amounts of nutrients, frequent soil tillage and leave very little crop residue on the field. That is why potato production has been associated with environmental issues such as increased nitrate leaching and soil degradation. This most often occurs during the wet periods (fall and spring) when ground cover and crops are absent. Soil bacteria turn leftover nitrogen, not used by crops, into nitrate -- a highly soluble form of nitrogen that can leach into nearby waterways affecting the water quality.

To address these issues, Agriculture and Agri-Food Canada (AAFC) scientists, in collaboration with academia, growers, and other industry professionals, have examined how the use of cover crops can enhance potato productivity and soil health, while reducing nitrate leaching.

After looking into one- or two-year full season cover crops (legumes, grasses, or a mixture of the two), the scientists determined that growing legumes, known to capture nitrogen from the atmosphere and add it to the soil, as cover crops resulted in higher potential of nitrate leaching when compared to grasses, but did not increase potato yield. In contrast, when they compared different cover crops grown for only one



Winter rye seeded in a commercial field and used as winter cover crop after potato harvest, Kensington, PEI.

growing season, growing pearl millet and sorghum Sudan grass returned more carbon to the soil, reduced nitrate leaching risk, and produced higher potato yields with a lower number of root lesions caused by nematode pests.

For producers who can grow cover crops for two years, to get the best of both worlds, the recommended beneficial practice is growing a two-year mixture of grass and legume forage, as the legumes will increase soil nitrogen supply and improve soil quality while the grasses will reduce nitrate leaching.

In addition, growing winter cover crops -- such as winter rye and winter wheat, seeded after harvesting early-maturing potato varieties -- provides ground cover in the fall and spring that helps reduce the amount of leftover nitrogen that could leach, and lower the chance of soil erosion.

The results of this research will help potato growers make informed decisions about using cover crops to help decrease nitrate leaching and prevent soil erosion on their farms. Overall, this research can help minimize the environmental impacts of potato production while improving its long-term sustainability.

Nurse crops

In the Maritimes, the sandy soils, wet climates, and sloping agricultural lands can increase the risk of soil erosion -- especially during the three to five weeks that it takes for potato plants to emerge in the spring. Due to potato's shallow roots, the crop has to be planted in finely tilled soil, which is more susceptible to erosion. Cold and wet spring conditions can also delay sprouting of the potato plants for several weeks, and heavy spring rains can further increase the risk of soil erosion. Even after the potatoes emerge, the wide row spacing means that the soil remains

partially bare for several weeks until the canopies of the rows come together (row closure). With this in mind, Agriculture and Agri-Food Canada (AAFC) scientists and their partners are finding ways to close the window of time that the soils remain bare and minimize the risk of erosion.

One promising option is the use of nurse crops -- fast-growing crops that are planted between the potato rows. For example, winter rye and spring barley germinate quickly and can be killed off before potato hilling -- a practice of bringing loose soil up around the plant to increase the soil volume in which potato tuber can form and grow.

The AAFC team found that these nurse crops can help protect the soil against erosion by holding the soil particles in place. They also reduce surface crusting, which occurs when a heavy rain strikes an unprotected soil surface and turns the top layer of soil into a uniform surface seal. This surface crust can be strong enough to prevent crops from getting enough water, obstruct emergence of new plants and lead to increased erosion. Nurse crops were found to effectively protect the soil early in the potato growing season and mitigate soil erosion, especially in fields with a significant slope, without negatively affecting potato yield.

Future research will help assess nurse crop management (such as seeding rate as well as the timing of terminating nurse crops and of potato hilling) to further boost potato marketable yield.

Dr. Judith Nyiraneza is an Agriculture and Agri-Food Canada research scientist based in Charlottetown, Prince Edward Island. She presented some of these results during the 2023 annual meeting of the Potato Association of America.

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The cost of crop inputs is rising to unprecedented levels; growers are facing difficult choices about providing fertilizer to their crops. Well, there is a treasure trove of nutrients already in most soils – some of it bought and paid for in past years – but presently unavailable to plants for various reasons. Essential macro nutrients such as phosphorus and potassium are often present in significant amounts but are unavailable due to tight soil chemical bonds with other elements. However, biological activity can break these bonds and release the nutrients, allowing uptake and use by crops.

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“For annual crops, it is important to apply BioMax when soils are just starting to warm up in the spring,” de Jong says. “Soil temperatures should be at least 42°F to 44°F for microbial activity to begin. When that happens, BioMax can energize that activity. Perennial crops such as trees and vines can benefit from BioMax applied not just in the spring but also in early fall, making sure essential nutrients are available before dormancy. Adequate soil moisture is an important factor for microbial activity so application during a drought scenario should be followed by supplemental irrigation.” BioMax can be applied via most irrigation systems or band sprayed at the base of rows and watered in as a soil drench application.

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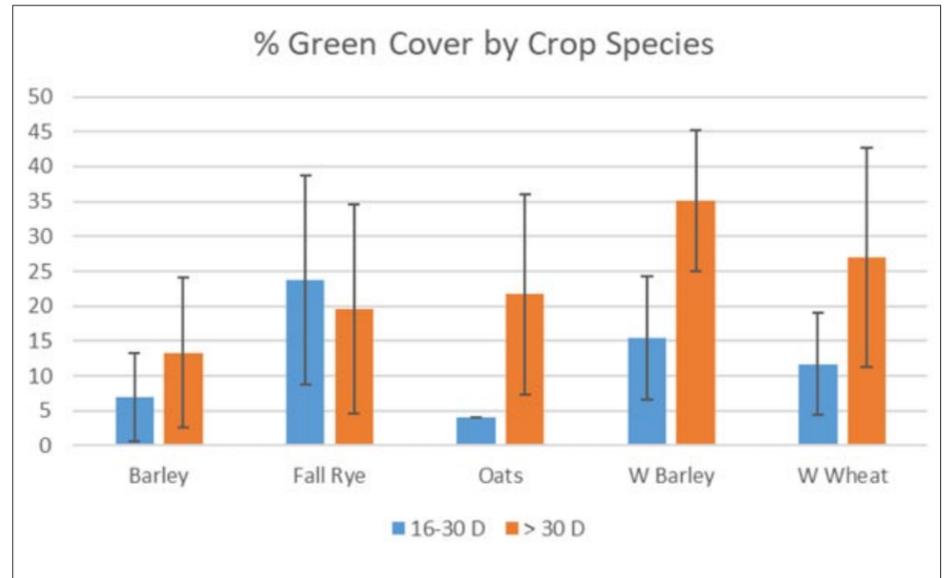
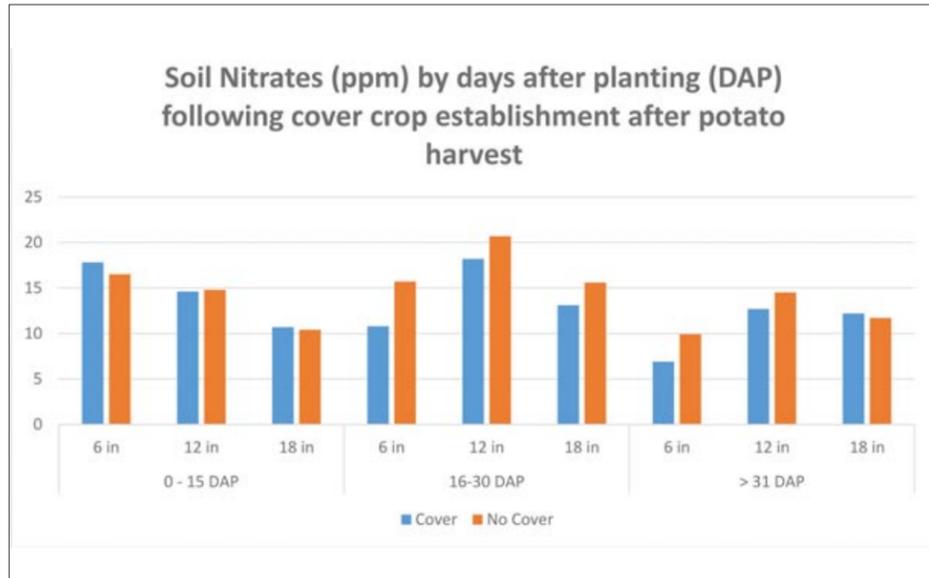
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FOCUS: SOIL HEALTH & CROP NUTRITION

Optimizing cover crops after potatoes



RYAN BARRETT

The use of fall cover crops are associated with a number of benefits, including reduced soil erosion, conservation of soil nutrients, and improving soil organic carbon and soil health. The majority of potatoes grown in Prince Edward Island (PEI) are harvested in the month of October. This means that there is a relatively narrow window post-harvest to establish a cover

crop before soil temperatures and weather conditions make cover crop establishment difficult.

While there are a substantial amount of acres being cover-cropped post-harvest in PEI (40-50% of potato acres, according to annual PEI Potato Board grower surveys), there are many questions from producers on best management practices, including species selection, establishment method, and seeding rates. In this project, it was our goal to work with producers doing on-farm

trials to assess a range of cereal cover crops after potato harvest for both best agronomic practices but also for their impact on soil erosion and soil nitrates.

In 2019, the PEI Potato Board was selected to lead a project for four years (2019-2022) under the Living Labs Atlantic initiative to investigate the use of fall-planted cover crops following potato harvest. Each field trial included a no cover crop control treatment compared with one or more cover crop treatments. Some field

trials compared multiple cover crop species, while others compared different methods of establishment, different seeding rates or dates. There were seven fields established in 2019, eight in 2020, six in 2021, and one in 2022. Fields were located in the three primary watershed areas participating in the Living Labs initiative: Kensington North, Dunk River, and Souris & area.

Over the four years, we had eight fields with winter barley, four with oats, eight with spring barley, six with fall rye, five with winter wheat, five doing seeding rate comparisons, one with different methods of establishment.

Unsurprisingly, the average percentage of green cover for the cover crop treatments (17.8%, averaged across all dates) was significantly higher than for the no cover crop treatments (1.0%). Winter barley and winter wheat had the best percentage of green cover late in the fall in this trial, followed by fall rye and oats. One piece of context that should be added is that the winter barley and winter wheat were primarily planted in late September or early October, while several of the fall rye fields were planted in mid-October.

Nonetheless, the fast emergence and good growth of the winter barley were particularly interesting in this trial, as winter barley has not been grown often in Prince Edward Island previously. However, when we followed up with winter barley fields the following spring, the majority of these fields had a significant amount of winter dying of the cover crop. Only two of the eight winter barley fields in the study were eventually harvested as a cash crop, and only one of these had what the producer would categorize as a satisfactory yield (> 2 MT/acre). Therefore, winter barley planted after potato harvest appears to do well as a fall cover but does not hold the same potential as winter wheat to be harvested the next year.

The percent green cover was influenced more by the planting date than by the seeding rate. In two trials, a 33 or 66 per cent

increase in seed cost very marginally improved per cent cover, if at all. This would lead us to recommend a lighter seeding rate for these spring cereals but with a seeding date as early as possible. Lowering the cost may help with improving the level of adoption for this practice. In future studies, more could be done to further narrow in the optimum seeding rate for multiple species, including winter cereals.

Splash pans were installed to measure the potential for soil erosion caused by dislodging of soil by rainfall or wind from the soil surface. In 18 splash pans where no cover crop was planted, we saw an average soil accumulation throughout the season of 31.8 g, compared to 24.8 g in the cover crop treatments (total of 23 splash pans). While this was not statistically significant ($p = 0.159$), there is an encouraging trend (22.2% reduction). There was a high degree of variability between fields and between years. In fact, there was a significant difference in accumulated soil between years, when 2019 (42.5 g) and 2020 (36.9 g) showed much more soil accumulated in the splash pans than 2021 (17.2 g). Soil nitrate concentrations (in ppm) were checked at three depths (0-6, 6-12 & 12-18 inches) and at different days after planting in 2019-2021. Differences in concentrations were non-significant at each of the three depths when comparing cover crops with no cover crop treatments. While there was a trend toward a reduction (especially at the first two depths), it is statistically not significant.

One of the limitations of this trial, acknowledged from the beginning, was that growers are very busy during harvest, and it can be challenging to propose and implement multiple treatments. Growers were more willing to entertain comparing different species or different rates than different seeding dates, as that would require a second trip to the field.

Continued on next page

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FOCUS: SOIL HEALTH & CROP NUTRITION

Optimizing cover crops after potatoes

Continued from page 18

For many producers, the biggest barrier to getting cover crops established is a lack of available labour and equipment.

For some producers, there is a reluctance to use fall rye as a winter cover crop. Because of its hardy nature, it almost always survives the winter in PEI and will need to be managed the following spring. The grand majority of cereal rye in PEI is not managed to be harvested, rather, it is terminated before planting another crop. This is less of an issue ahead of a glyphosate-tolerant crop such as corn or soybeans or a full season cover crop, but more of an issue ahead of barley or oats. Our data in this project has shown that fall rye will establish reliably in most years until October 15th; in some warm falls, it has successfully established up to October 31st. However, the producer needs to have a management plan to deal with that fall rye cover crop the next spring, depending on the projected crop rotation.

Some producers are also hesitant to use glyphosate to manage cover crops; instead, they would rather that the cover crop be winterkilled and avoid using herbicide. While this saves an expense, it reduces the potential to mitigate soil erosion and nitrate leaching and also reduces the potential to increase soil carbon. Better understanding the trade-offs and economics in managing cover crops in potato rotations should be a focus of future research or on-farm demonstrations.

Winter barley did not reliably over-winter in most of the trial fields in this project. It appears that seeding winter barley following potato harvest in late September or early October is too late for reliable over-wintering and production of a harvestable crop. Perhaps seeding in early or mid-September may provide sufficient time for winter barley to establish and fortify itself for acceptable survival the following spring. In all of our trials where winter wheat was planted, there was an acceptable level of winter survival and those fields were eventually harvested as a cash crop. Ideally, maximizing the number of acres in PEI that are planted with a fall cover crop that will also be harvested as a cash crop is in the best interest of both the profitability of producers as well as the long-term health of soils. Future research into the successful planting window for winter wheat, particularly given the changing nature of our climate, is warranted. If there was a greater market for rye as a cash crop, there is considerable potential to increase acreage of this cover crop.

One of the true take-home messages from this project was demonstrating that after the first days of October the ability for spring cereals such as barley or oats to reach the desired level of cover is limited. Where possible, producers are recommended to prioritize winter cereals after the first days of October in most years. Barley and oats are better than nothing as a fall cover, winter cereals will establish better in colder soils and will continue to regrow in the spring, further

protecting soils from erosion

The research team would like to thank the participating farmers. Their interest and cooperation were integral to the success of the project. We would also like to thank staff from the Kensington North Watershed Association, Souris and Area Wildlife Association, Bedeque Bay Environmental Management Association, PEI Department of Agriculture and Land, and Agriculture and Agri-Food Canada for their assistance in

data collection. Thanks also to Dr. Judith Nyiraneza and her team at AAFC Charlottetown for assistance with statistical analysis as well as assistance in developing the project plan for this project. Special thanks to Morgan McNeil, who worked with the PEI Potato Board from 2019 to 2022 and who was largely responsible for management of these trials on a daily basis. Finally, thanks to Andrea McKenna and the East Prince Agri-Environment Association for

coordinating and managing the Living Labs Atlantic project over the past four years. It has been a pleasure to work with the EPAA and the other project partners as part of this collaborative research effort.

Ryan Barrett is research and agronomy specialist, Prince Edward Island Potato Board.



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Crop nutrition: just enough at just the right time based on soil type

NutriAg is using Artificial Intelligence (AI) to optimize product development for new crop nutrition applications and technologies. Most importantly, the company's experts can finetune recommendations for the soil type and the physiological stage of the crop.

NutriAg has invested significantly in NutriAnalytics, an AI-powered digital ag platform, for the past 10 years. NutriAnalytics uses various machine-learning algorithms to interpret tissue sample results for farmers throughout the world.

“By employing these novel and modern methods we can tune our recommendations by crop, physiological timing, soil type, among many other agronomic factors,” says Terry Kukle, vice-president marketing and technology. “These recommendation systems have been validated in more than 20 field trials, several of which were conducted by third parties over the past five years. On average using these modelling systems, along with NutriAg technologies, we have averaged more than 10 per cent yield improvement across our trials with an average ROI of more than seven times.

Together with key players across North America, the NutriAg team has mapped and quantified the ideal nutrient balance of various horticultural crops at specific stages of physiological development. For growers, the relevant outcomes are mostly focused on crop yield and quality.

Validating results in the field

NutriAg has recently completed a commercial-scale validation trial with one of the world's largest fruit producers of its type whereby fertigation recommendations were based on the proprietary technology platform and modelling systems. Yields were increased by an average of 11 per cent over grower standards when rapid in-season, AI-optimized fertigation plans were followed. These fertigation applications were automatically modified, by cultivar, based on both weekly weather and water quality data along with regular tissue sampling.

For example, while working with horticultural growers in California, the NutriAg team found some interesting relationships between soil type and responses to nutrient accumulation in plant tissues.

“We incorporated some model tuning parameters, based on soil type, to optimize the tissue sample interpretation systems,” explains Sebastian Margarit VP agronomy and informatics. Distinct differences were found with the deleterious accumulation of chloride (Cl⁻) in tissue samples in sandy soils as compared to tissue



samples from loams and clays. The negative effects of salinity were most dramatic in sandier soil as compared with loams and clays even at the same concentrations of chloride in the tissue. This suggested that water resources could potentially be allocated based on soil characteristics.

“We also found potential remediation strategies around certain micronutrients (Zn, Mn, Cu) involved in the detoxification of Reactive Oxygen Species (ROS) when Chloride accumulation was significant in tissues,” says Margarit.

Using bionutritionals technology

“We are now using these same statistical methods to develop our Essential Bionutritionals technology to select the optimal concentration and composition of various cofactors, vitamins, and peptides to optimize nutrient-use efficiency and product performance,” Dr. Kelly Tanaka, chief scientific officer at NutriAg. By seamlessly integrating AI into its research and development operations, NutriAg has significantly accelerated the pace and accuracy at which the company can assess the viability and effectiveness of its latest products.

“The successful utilization of AI in managing our new product development has marked a pivotal turning point in our ability to deliver cutting-edge, sustainable solutions to our valued customers,” stated Tanaka “This technological advancement empowers us to more effectively tailor our formulations to the specific needs of a crop in a given soil type and ensure improved yields while minimizing environmental impact.”

As an example, we hope to launch Nutri Lex in early 2024, an exciting new product that has EBN technology integrating AI with formulation chemistry and greenhouse trial results.

“By harnessing the capabilities of AI, NutriAg is committed to constantly innovating and redefining farming practices, allowing growers to prioritize environmental consciousness without compromising on crop productivity,” affirmed Martin Bloomberg, president of NutriAg.

For more information about NutriAg and its AI-driven initiatives, visit www.nutriag.com.

Photo by Glenn Lowson.



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Acadian Plant Health unveils BioSwitch technology

Acadian Plant Health is introducing BioSwitch, an advanced technology that stimulates plant growth, improves soil health, and protects against environmental stressors. Sustainably harvesting the unique seaweed species *Ascophyllum nodosum* and using a proprietary extraction process to ensure a maximum composition of beneficial bioactive compounds, BioSwitch stimulates crops by triggering natural processes and active compound production. BioSwitch-activated biostimulants offer a unique and consistent biochemical composition that delivers the most consistent concentration

of stress-mitigating biomarkers on the market.

“Biostimulants are increasingly being used to help mitigate the impacts of weather and soil variability,” says James Maude, senior vice-president portfolio development, Acadian Plant Health. “As the biostimulant market continues to grow, it’s important to differentiate highly effective solutions that are grounded in robust science and research. BioSwitch technology is our commitment to sustainability and unparalleled performance.”

Backed by more than 20 years of trials,

BioSwitch-activated biostimulants perform at a consistent, market-leading level. The proprietary alkaline extraction process that BioSwitch-activated biostimulants undergo is proven to maximize the extraction of biomarkers that form bio-actives from the seaweed, meaning that biostimulants with the BioSwitch logo have bio-actives that are produced in their most pure and active state.

The core benefits of BioSwitch-activated biostimulants include reduced abiotic stress, improved soil health, plant resilience, root stimulation and growth, and nutrient use efficiency. BioSwitch-

activated biostimulants are a key tool in regenerative and climate-smart agricultural practices.

As the world’s largest marine plant harvesting, cultivation, and extraction company, Acadian Plant Health strives to transform agriculture through sustainable, science-based biological solutions to support the industry’s adoption of regenerative agricultural practices for the benefit of plant and planet.

Visit Our Technology page to learn more.

Source: *Acadian Plant Health November 7, 2023 news release*

BITS & BITES

Sixth edition of The Real Dirt on Farming released



Farm & Food Care officially unveiled the sixth edition of *The Real Dirt on Farming*, its flagship public-outreach publication, at its Harvest Gala on November 16, 2023.

The Real Dirt on Farming is a nation-wide initiative designed to help Canadians connect with their food and the farmers that produce it – who they are, what they do, and why they do it.

Using both stories and science, the 60-page publication addresses common questions and misconceptions about Canadian food and farming, as well as other subjects that the general public has indicated are important to them.

The 2023 edition features farmer and researcher profiles from across the country – from the Yukon to Newfoundland and all points in between. It covers big topics being talked about currently in Canadian agriculture – from farmer mental health to the critical work done by seasonal agricultural workers; sustainability, food inflation, food insecurity and food waste, climate change, plant breeding, animal welfare and more.

The booklet is created through a partnership of the three Farm

& Food Care organizations in Saskatchewan, Ontario and Prince Edward Island and was written by freelance journalists Lilian Schaer and Matt McIntosh. An expert committee comprised of researchers, commodity and subject matter experts were also involved in reviewing and vetting content.

This is the sixth edition published since the project’s inception in 2006. To date, approximately five million copies have been distributed across Canada.

The booklet is available in English and French. By early 2024, a digest version will be available as a digital educator resource coming from Agriculture in the Classroom Canada and a new 4-H manual being created by 4-H Ontario. Distribution of

the booklet will also begin in earnest in 2024 with plans for mainstream media inserts and mailings to politicians across Canada.

The publication is currently available online at www.RealDirtOnFarming.ca. Hard copies may also be ordered from the website. In total, more than 13 companies and agribusinesses across Canada supported the 2023 initiative. Champion level partners (\$20,000 or more) included long-time supporters Wallenstein Feed & Supply Ltd and Canada Beef.

Source: *Farm & Food Care November 17, 2023 news release*

Naïo Technologies

“Naïo is the sole manufacturer in the agricultural robotics sector that has developed Augmented Autonomy. This revolutionary technology allows the robot fleet to function fully autonomously, while adhering to all regulatory and safety requirements, paving the way for more efficient and sustainable agriculture,” states Aymeric Barthes, co-founder of Naïo Technologies.

The French company, located near Toulouse, is the only one to offer a CE and FCC certified autonomy for both its light and heavy robots. Naïo assumes liability in the event of an incident, provided the usage conditions are respected. Farmers can allocate more time to high-value tasks with the help of these robots. Autonomous machines, requiring no supervision, are a solution to the escalating global labour shortage.

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Cucurbit diseases and fungicide selection

ELAINE RODDY

Cucurbit disease management is a complicated affair. While most pathogens can infect the whole crop group, each type of cucurbit has its own specific susceptibilities. What may be a significant pathogen to one crop is almost a non-event in another.

Meanwhile, when looking across the different groups of fungicides, several have developed resistance to key pathogens. To add to the complexity, many fungicides are now sold as premixes of two or more active ingredients, so it can be hard to know which product is strongest on which disease.

Broad spectrum fungicides from the “M” group play a valuable role in providing a baseline level of protection to a wide range of foliar pathogens. However, while these products are good to have in the rotation, they are not heavy hitters when it comes to managing the peak infection periods. These products are good options for the beginning of the season when disease pressure is low. Once the canopy closes and fruit are developing, it becomes important to select products based on the target pathogen(s) for that crop.

With the new use restrictions on chlorothalonil (Bravo/Echo), it is important to consider the spectrum of control when selecting fungicides. As each group of products has specific strengths

and weaknesses, there is no one-size-fits-all solution.

Downy mildew products are typically specific to the water-mould fungi and will have little impact on other (true) fungal diseases. These products are essential for downy mildew susceptible crops such as cucumbers and cantaloupe. When applied to the other crops, they may result in gaps in control for more economically important diseases. Even within downy mildew products, not all are equally effective. Where a product is labelled for suppression, the level of control may not be enough to provide an adequate level of protection from this disease.

Powdery mildew is the primary pathogen for pumpkins and squash. Luckily these products often control a range of pathogens including fruit rot pathogens such as gummy stem blight, anthracnose and alternaria. To be effective, these products must be applied preventatively. While fruit rot pathogens are most obvious at harvest, the disease often starts much earlier in the growing cycle. Preventing early inoculum growth is an important tool in disease management. Once the canopy is fully closed, the environment becomes quite humid with extended periods of leaf wetness. Ideal for fungal growth!

Products from group 7 and group 50 provide strong powdery mildew control. Keep in mind



Key Foliar Pathogens by Cucurbit Crop Type

Pumpkins, Squash and Gourds	Cantaloupe	Watermelon	Cucumbers	Zucchini
Powdery Mildew	Anthracnose			
Gummy Stem	Alternaria			
Blight/Black Rot	Downy Mildew	Anthracnose	Downy Mildew	Downy Mildew
Scab	Scab	Alternaria		Powdery Mildew
Septoria	Septoria			Viruses



Figure 1. Anthracnose on cucumber leaf



Figure 2. Anthracnose lesions on watermelon

that varying levels of resistance to powdery mildew have been documented in both group 3 and group 11 fungicides. Powdery mildew control with those products may be variable. However, these products can provide valuable control for other pathogens. For a full spectrum of control, it is important to rotate regularly between the various

modes of action.

With all fungicides, contact with the leaf area is essential. There are no truly systemic fungicides available on the market today. Some products will provide a small amount of translaminar movement from the upper leaf surface to the lower surface. This assists with control but cannot replace good spray coverage. There is a wealth of information on sprayers, nozzles, pressure, and water volumes on the sprayers.com website. It is definitely worth a visit when you are planning your 2024 disease management strategy!

Anthracnose

Anthracnose, caused by the pathogen *Colletotrichum magnum* (on fruit), *C. orbiculare*, is not a new pest to cucurbits. Watermelon and cantaloupe are typically the most susceptible crops, however this year it was also prevalent in field cucumbers. This is likely due to changing fungicide use patterns.

Key factors for anthracnose control:

- Products typically used in cucumbers and melons for downy mildew control, have little impact on fungal diseases such as anthracnose.
- The use of mancozeb early in the season before the canopy closes can help protect the crop against a wide range of pathogens. Keep in mind that it has a 14-day pre-harvest interval.
- Chlorothalonil is now limited to two applications per year. With a two-day pre-harvest interval it is most valuable used as a tank-mix

at canopy closure or during harvest.

- Scout the crop regularly for early symptoms or signs of the disease. If disease is present early during the harvest, consider adding a fungicide from group 3, 7 or 11 to the rotation.
- As with all crop pathogens, the best management strategies are preventative. Once established in the crop, it is very hard to prevent further spread.

What to look for: symptoms include dry, brown irregular-shaped lesions formed on the leaves. They are often surrounded by a light green or yellow halo. They lack the distinct angular appearance of downy mildew. Black fruiting bodies (called acervuli) may be visible on the under surface of older lesions. On the fruit, the lesions appear sunken and light brown in colour. The size of the lesions can vary depending on the infected crop. Salmon pink spores may develop on the lesions under moist conditions. Symptoms develop four to five days after infection. It is usually a late-season disease, thriving in warm temperatures of 22- 27°C (72- 81°F) and high relative humidity (100% for 24 hours).

Crop residue is the primary source of anthracnose inoculum. A three- to four-year crop rotation away from all cucurbit crops will reduce inoculum levels in the soil and help to prevent future infections.

Elaine Roddy is vegetable crop specialist, OMAFRA, based in Ridgeway, Ontario.

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BITS & BITES

McCain Canada enters the frozen vegetable category with Medleys side dishes

McCain Canada has entered the frozen vegetable category with the launch of new McCain Medleys side dishes, featuring blends of lightly seasoned red potatoes and vegetables. Now available at most major grocery retailers across Canada, McCain Medleys come in two distinct flavours: Italian-style Roasted Potatoes & Veggies and Roasted Potatoes & Broccoli. They can be prepared in the air fryer or oven in only 16 minutes.

McCain has partnered with celebrity chef, Susur Lee, to create a custom recipe and social content in promotion of the new product. Susur's Instagram and TikTok content for this campaign are created in collaboration with his son, Jet Bent-Lee, and focuses on the importance of family

connection during mealtimes.

"Cooking is my career and my passion, but there's nothing I love more than cooking with my sons," says Canadian chef and father of three, Susur Lee. "New McCain Medleys offer a versatile and quick mealtimes side, and because they can be served in 16 minutes, they allow me the chance to spend more time connecting with my family."

Medleys were designed to fulfill an unmet need within the category as identified by McCain through a global study of 175,000 consumers. The study indicated busy families were craving a side dish solution that was both crowd-pleasing and nutritious while also simple to prepare in under 20 minutes.

- Italian-style Roasted Potatoes

& Veggies: A blend of roasted red potatoes, green beans, yellow beans and sweet red peppers is perfectly seasoned with garlic and rosemary for a family-favourite side dish

- Roasted Potatoes and Broccoli: A convenient combination of roasted red potatoes and tender broccoli, perfectly seasoned with garlic, onion, sea salt, spices and herbs

"As the leader in French Fries, McCain has invested a lot in research and development to provide restaurant quality experiences at home," says Mike Embir, marketing director at McCain Foods Canada. "For McCain Medleys, we implemented this same rigour to deliver crisp and vibrant vegetables alongside our delicious



potatoes to ensure we bring the same quality and joy to the table, for occasions when families are seeking a quick and easy weeknight dinner solution that doesn't involve boring, soggy

frozen veggies."

Source: McCain Canada November 13, 2023 news release

OPVG offers bursary program to students

The Ontario Processing Vegetable Growers (OPVG) Bursary Program was created to support and encourage students pursuing a career in the processing vegetable industry and to ensure there are new individuals who will have the interest, skill and ability to further develop and grow this sector of Ontario's agri-food economy.

The program allows for three bursaries to eligible college or university students studying commercial field agriculture/horticulture or food manufacturing. One bursary is awarded to a student in their 2nd year at Ridgetown Campus, with a value of \$2,000 in memory of former OPVG Director Jim Whitson. The second bursary is awarded to a student in their 2nd, 3rd, 4th or

post-graduate year of study at an eligible college or university, with a value of \$2,000 in memory of former OPVG Director Ken Epp. The third bursary is an Industry award with a value of \$1,000 for a student in their 2nd, 3rd, 4th or post-graduate year of study at an eligible college or university. Applicants must be registered as a full-time student in a program which relates to the processing vegetable industry.

Eligibility details and a Bursary Application Form are available on our website at www.opvg.org or by request via email at opvg@opvg.org. Applications must be received at OPVG no later than January 5, 2024.

The Ontario Processing Vegetable Growers (OPVG) is

a marketing board regulated under the Farm Products Marketing Act and represents nearly 350 Ontario processing vegetable growers producing crops such as tomatoes, onions, sweet corn, carrots, cucumbers, green & wax beans, lima beans, green peas, squash and pumpkin. Farm gate sales for our processing vegetable crops in 2022 was \$144 million. OPVG members are family-owned and operated businesses, growing vegetable crops for Ontario food manufacturing companies.

Source: Ontario Processing Vegetable Growers November 9, 2023 news release

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S30P400NSHD - Orchard Head. Diaph pump.	\$ 27,900.00	\$ 35,700.00
S30P500NS - Orchard Head. Diaph pump.	\$ 32,500.00	\$ 37,500.00
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USED - S30P400NS. Orchard Head. Diaph pump.		
Year: 2015	\$14,900.00	\$ 36,500.00
USED - S30P500NS. Orchard Head. Diaph pump.		
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Election of Directors of the Association will take place as well as dealing with resolutions and any other business that may arise.

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Thank you!

I have had the privilege of working my entire career in the Agriculture industry.

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A sincere thank you to all. Keep well,

Brian Tregunno

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CROP PROTECTION

Using genetic tests to confirm herbicide-resistant weeds in Ontario crops

KRISTEN OBEID

Since 2016, this project has developed 24 genetic quick tests (more in progress) to assist in identifying herbicide resistance in 14 weed species and confirmed 207 new cases of herbicide resistance in Ontario crops. These tests deliver a diagnostic and a recommendation to the grower within the same growing season.

Traditional resistance testing in the greenhouse can take from three months to a year to get results back to growers. Now, leaf tissue instead of seed is collected. DNA is extracted from the leaf tissue to determine if there is a change in the sequencing resulting in a mutation making the plant resistant.

Tests have been developed to differentiate between Brassica and Amaranthus (pigweed) species. Tests differentiating pigweed species have been instrumental in confirming new cases of waterhemp in Ontario, Manitoba and Québec. Once confirmed, the waterhemp is tested for Groups 2, 5, 9 and 14 resistances. Waterhemp has been found in 18 Ontario counties.

Kristen Obeid is OMAFRA weed management specialist – horticulture.

Table 1. Genetic Tests Currently Utilized by Harvest Genomics Weed Species

	Herbicide Group	Resistance & Tests
Large crabgrass	1	Metabolic: ACCase gene amplification
Common chickweed	2	Target-site (P197Q & unpublished)
Common ragweed	2	Target-site (W574L)
Eastern black nightshade	2	Target-site (A205V)
Giant foxtail	2	Target-site (unpublished)
Giant ragweed	2	Target-site (W574L)
Pigweed spp.	2	Target-site (S653N & W574L)
Common ragweed	5	Target-site (V219I)
Giant ragweed	5	Target-site (V219I)
Lamb's-quarters	5	Target-site (S264G)
Pigweed spp.	5	Target-site (A251V, S264G, V219I & F274L)
Brassica spp.	9	Presence of transgene
Canada fleabane	9	Target-site (P106S)
Common ragweed	9	Thr102Ile, Ala103Val, Pro106Ser sequencing assay
Italian ryegrass	9	Pro (CCA) to Ser (TCA) mutation at Codon 106 in EPSPS
Waterhemp	9	Metabolic: EPSPS gene amplification
Common ragweed	14	MAPAQ mutation R98L
Pigweed spp.	14	Target-site (Δ G210 in PPX2L)
Amaranthus spp.	-	Species identification
Brassica spp.	-	Species identification

Ontario resistant weed testing results are in

KRISTEN OBEID

Ontario Agriculture – The resistant weed testing results are in and the results paint a very bleak picture for the future of weed management in this province. This year, 61 Ontario fields were tested and 55 of them confirmed herbicide resistant weeds. Of those 55 fields, 41 had weeds with 2-way or 3-way resistance. When I say 2-way or 3-way, I am referring to the weeds being resistant to 2 or 3 different herbicide groups, also known as multiple resistance.

Unfortunately, this is the trend every year. More and more weed species resistant to multiple herbicide groups. Of particular concern is waterhemp that has been found to be 5-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) in 8 counties in Ontario – Chatham-Kent, Elgin, Essex, Lambton, Middlesex, Northumberland, Ottawa and Stormant, Dundas and Glengarry. This brings the total counties with 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.

Another weed to watch is common ragweed. Common ragweed populations have been found to be resistant to herbicide groups, 2, 5 and 14 in 3 counties – Bruce, Lambton and Prescott and Russell. And the new 2-way resistant redroot and green pigweed to herbicide groups 5 and 14 is extremely concerning to all



carrot growers because it has been found in all the major carrot growing counties – Chatham-Kent, Lambton, and Simcoe.

None of this is good news. Resistant weeds can increase weed control costs more than 10 x on any farm that has them. So, what should you do? Make sure you test any suspect weeds on



your farm immediately, so you know what you're dealing with. And if you have resistant weeds, prevent spreading them from field to field by managing the fields with resistant weeds last and cleaning all your equipment right away.

To obtain sample collection kits please contact me in the

spring: Kristen Obeid, OMAFRA Weed Management Specialist for Horticulture Crops on twitter @WeedProfesh, by email: kristen.obeid@ontario.ca or text 519-965-0107

Kristen Obeid is OMAFRA weed management specialist – horticulture.



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*Always read & follow label instructions

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Kocide 2000-O fungicide registered for apples



Crop(s)	Target	Rate (kg /ha)	Application Information	PHI (days)
Apples	Control of Apple Scab	1.5 – 2.5	Make one application every 5-7 days starting application between silver-tip and green-tip. Apply as a full cover spray for early season disease suppression. Use the higher rate when conditions (site history, cultivar sensitivity, predictive model) favour disease progression. Apply using ground application equipment or airblast only. Note: Moderate to severe crop injury may occur from late application; discontinue use when green-tip reaches 1/2 inch. Do not exceed the maximum annual rate of 11.43 kg/ha.	2
	Control of Apple Scab	0.56 – 0.84		

JOSH MOSIONDZ

The Pest Management Regulatory Agency (PMRA) recently approved a minor use label expansion registration for KOCIDE 2000-O Fungicide for control of apple scab and fire blight on apples in Canada. KOCIDE 2000-O fungicide was already labeled for disease control on a wide

range of crops in Canada. This minor use proposal was submitted by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec as a result of minor use priorities established by growers and extension personnel.

The following is provided as an abbreviated, general outline only. Users should be making disease management decisions within a robust integrated disease management program and should consult the complete label before

using KOCIDE 2000-O fungicide.

For a copy of the new minor use label your local tree fruit IPM specialist, your regional supply outlet, or visit the PMRA label site <http://www.hc-sc.gc.ca/cps-spc/pest/registant-titulaire/tools-outils/label-etiq-eng.php>

Josh Mosiondz is minor use coordinator, OMAFRA.

Cimegra insecticide label is expanded



Already renowned for providing true wireworm control in-furrow, Cimegra insecticide is now registered for foliar use on Colorado potato beetles says BASF Canada Agricultural Solutions (BASF). As part of BASF's commitment to providing solutions to help grow healthy crops, Cimegra delivers effective control against one of the most damaging and yield-inhibiting insects for potatoes.

"Cimegra is a unique product in our insecticide portfolio because it is currently the only Group 30 available on the market," says Chris Vander Kant, corn, soybeans and horticultural crop manager, BASF Canada. "It's important to us at BASF to provide growers with alternative options in their integrated pest management strategies as Colorado potato beetles start to develop resistance to other insecticide groups on the market."

Cimegra works through both

contact and ingestion, so it is a powerful tool for growers looking for control of chewing pests. Powered by the unique IRAC Group 30 mode of action,

Cimegra provides rapid knockdown and control of tough chewing pests.

The label expansion for foliar use on potatoes now allows growers to control the two toughest pests in potatoes – wireworms and Colorado potato beetles – with one product.

In addition to the label expansion for foliar application in potatoes, the Cimegra label expansion also includes:

- Brassica head and stem vegetables: Foliar treatment to control diamondback moth, cabbage looper, imported

cabbageworm and flea beetles.

- Leafy vegetables: Foliar treatment to control diamondback moth, imported cabbage-worm, cabbage looper, flea beetles and red-headed flea beetle.

- Fruiting vegetables: Foliar treatment to control Colorado potato beetle, tomato hornworm and tobacco hornworm.

- Leaf petiole vegetables: Foliar treatment to control diamondback moth, imported cabbage-worm, cabbage looper, flea beetles and red-headed flea beetle.

- Sweet potatoes: Pre-transplant soil-applied and incorporated to control wireworms.

MRLs have not yet been established in key export markets, including the United States, to support foliar application to Brassica head and stem vegetables, leafy vegetables, fruiting vegetables and leaf petiole vegetables.

- Always read and follow label directions

Source: BASF Agricultural Solutions November 7, 2023 news release Photo by Tracy Shinnars-Carnelley

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CROP PROTECTION

SuffOil-X receives label rate reduction

BioWorks, Inc. (BioWorks) has been granted an application rate reduction for SuffOil-X from 1.3% to 1% volume per litre of water, that importantly has no effect on efficacy. SuffOil-X is a leading insecticide, fungicide and miticide that is approved for organic production.

The rate reduction is based on data generated from separate apple and strawberry trials conducted against European red spider mites and two-spotted spider mites, respectively. The studies compare the 1% versus 1.3% rates and demonstrated that the two rates are equal in terms of efficacy. SuffOil-X customers will use even less oil from a formulation

that already delivers lower petroleum oil content without sacrificing performance.

SuffOil-X is a highly-refined mineral oil with a unique, pre-emulsified formulation which reduces petroleum in the environment by almost 20 per cent, while diluting faster and more thoroughly in the spray tank than other agricultural oils. In addition to the new rate reduction, SuffOil-X also features a droplet size that is 93 per cent smaller than other agricultural spray oils to ensure optimal plant coverage which delivers high levels of protection and results in faster dry times. Reduced petroleum and rates combined with droplet uniformity,

dramatically reduce any instances of phytotoxicity.

“Grower cooperators have been working with SuffOil-X for several years, and this experience combined with our own research has demonstrated excellent efficacy at 1% volume per liter of water,” said Michael Brownbridge, senior technical services manager at BioWorks. “This change provides growers with an agronomic and economic advantage.”

The SuffOil-X Solution

- Reduced oil delivered to plants
- Works by suffocation in all stages of soft-bodied insects and mites: eggs, larvae, nymphs.

- Specific targets: mites, thrips, whiteflies, aphids, scales, mealybugs, powdery mildew

- Quick and easy spray tank mixing
- Effective resistance management tool

SuffOil-X is distributed to outdoor fruit and vegetable retailers and growers by Cohort Wholesale. For more information about SuffOil-X, please visit <https://bioworksinc.com/products-canada/suffoilx-canada/>

Source: Cohort Wholesale November 7, 2023 news release

Certis Biologicals names distributor in Canada

Certis Biologicals, a leading developer of biopesticide solutions, has announced an exclusive distribution agreement with Belchim Crop Protection Canada for its flagship products, Double Nickel 55LC and LifeGard WG. Both products have earned recognition for their quality and performance.

This exclusive distribution agreement underscores Certis Biologicals’ commitment to delivering innovative agricultural solutions while optimizing the availability and accessibility of its products for growers.

“We are delighted to partner with Belchim Canada as our exclusive distributor for these products,” said Mike Allan, vice president of business development and licensing with Certis Biologicals. “Their extensive regulatory, marketing and logistics knowledge, combined with our innovative products and vertically integrated manufacturing model will undoubtedly create new opportunities. We are aligned in our desire to streamline and enhance the efficiency of our supply chain to fulfill our ultimate goal of benefiting growers.”

Belchim Crop Protection Canada, a distributor of chemical, biological and plant nutrition products in the agricultural industry, is excited to assume the responsibility of offering the products for all crops and uses as specified on the current product labels.

To learn more about Certis Biologicals, their portfolio of proven solutions and their commitment to sustainability, visit CertisBio.com.

Source: Certis Biologicals November 6, 2023 news release


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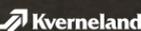






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