August/September 2023
Volume 24 Issue 3

Prince Edward Island POTATO NEWS

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Prince Edward Island
POTATO NEWS

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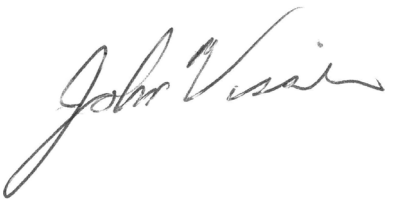
Features

Regular Departments

Cover: Fullertons Marsh sunsetting on a potato field. Photo by Amanda Pineau

Chairman's Comments

by John Visser, PEI Potato Board Chairman



PEI Potato Board News

2021 Potato Wart Investigation Completed

The thorough investigation unearthed only four finds of potato wart spores in fields that are associated with the same operation and in land that has part of the Potato Wart Long-Term Management Plan. That is 0.008% incidence. Investigation results indicate limited incidence in fields growing potatoes destined for the on-island processing market. The recent detections are within a distance of 12 km of each other and continue to be monitored and regulated under CFIA's Potato Wart Long-Term Management Plan.

Provincial representatives from across Canada visit PEI in early June to learn first hand about the potato wart investigation and long-term potato wart management plan.

Prince Edward Island Potato Board

Annual General Meeting & Banquet 2023

AGM - November 22, 2023

PEI Board Office Meeting Room

8:30 AM - 11:00 AM

Banquet - November 24, 2023

6 PM Reception

7 PM Banquet

Delta Prince Edward

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At Syngenta, we don't just talk about our commitment to helping you grow your best potato crop. We back it up with a dedicated team, comprehensive solutions to address the challenges you face every day, and resources to help you grow your best crop. In addition to product information, the Potato Guide gives you access to our **Potato Decision Tool** & **Potato seed treatment and in-furrow calculators.**

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Premier Dennis King presents Brenda Simmonds and Greg Donald with the Jubilee Medal for their service to the Prince Edward Island potato industry.

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Getting potatoes off to a healthy start is critical to a successful finish. That's where Titan® comes into play. It's the seed-piece insecticide that delivers superior, longer-lasting control of major aboveground pests like aphids, Colorado potato beetles, flea beetles and leafhoppers. And in addition to providing the broadest spectrum of protection available, Titan also helps reduce wireworm damage. So go big. Go with Titan. To learn more, visit **agsolutions.ca/Titan** or call **AgSolutions®** Customer Care at 1-877-371-BASF (2273).

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Welcome to the Potato Board, Rebecca MacSwain!

We are pleased to announce Rebecca MacSwain has joined the PEI Potato Board team. She will be getting direction from Seed Specialist Mary Kay Sonier for the next few months and will be assuming full responsibility for this role in the fall as Mary Kay transitions to retirement.

Rebecca grew up on a potato farm in Morell, PEI. She received her B.Sc. in Ag. Business from Dalhousie Faculty of Agriculture and is presently enrolled in the MBA program at UPEI. She is a Certified Crop Advisor and is a member of the PEI Institute of Agrologist.

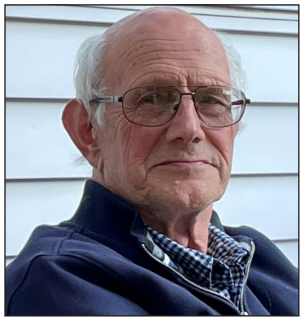
Rebecca has several years experience working in sales in the crop input sector in PEI and most recently in the commercial vegetable seed business. She is looking forward to meeting potato industry members, learning about current industry issues and becoming an industry advocate.

I am sure you will join me in welcoming Rebecca to the team. She can be reached at (902) 314-9208.

In Memorium

Cornelius (Kees) Visser

February 12, 1943 ~ May 18, 2023



Kees Visser was born in the Netherlands on Feb 12, 1943, he was the 3rd of 7 children. This past February, he celebrated his 80th birthday with 5 of his siblings and their spouses.

Kees and his family immigrated to PEI in 1958 by boat. He initially lived in Glenfinnan for a period helping a local farmer, while his parents settled the family in a farm in Victoria, PEI. Kees joined them shortly where he farmed with his father and brother, Gerard. Initially they farmed livestock, but after their father's death in 1969, they evolved the farm into a potato farm. They were progressive farmers, always willing to try new techniques. He often built his own equipment to solve unique problems, grew nuclear level seed potatoes at one time, implemented 3-year crop rotations well before it was an established practice and used anti-erosion berms before many others used them. He was President of the PEI Potato Producers Association for a time and an advocate and supporter of his neighbours and the local farming community.

Kees' farming expertise spilled over into vegetable gardening. He always grew a huge, varied garden, grapes in the green house, red currants bushes in a berry patch, and was well known for his bountiful asparagus. He shared the rich bounty of his garden with many neighbours and friends, along the way. When they moved to Cornwall in 2020, Kees took up a plot at the Cornwall community gardens. There was no doubt which plot belonged to him. The height, color and yield of the plants exceeded every other plot by a long shot, so much so, that you could see his plot from 100 yards away. Evidence of his willingness to experiment showed when, in the early 70's, curiosity caused him to plant marijuana, that he had found in his field, into his garden, to "see how big it would get".

Kees was a great provider and was very dedicated to his family. He and Elly were married for 55 years. They had 4 daughters; Pauline who died with a heart condition at 4 days and Maria, Nicole and Rochelle.

Like most farmers, Kees was very handy. He was skilled in all areas of construction, building garages, warehouses, and extensively renovating his own house in Crapaud, as well as all his children's houses. Beyond construction, he was also a self-taught skilled carpenter, building furniture, cedar canoes, kayaks, lathe work and many toys for the kids and grandkids.

Volunteering regularly was a big part of Kees's life. In the 1980's, he and Ellen went to Kenya and Tanzania with Farmers Helping Farmers. He went to Malawi with his brother Henk, twice, to build a church and a hospital. He also went to Grenada after a hurricane to build housing.

Kees and Ellen loved to travel and sometimes combined family visits with mission work. They made many treks to Holland over the years. They went to the Caribbean several times, Israel, Europe, Alaska and did a lengthy continent-wide road trip around North America. Kees loved all the places around the world that have hot weather and beaches.

Kees was a man of integrity and strength. He had a strong, quiet, faith and a private personal relationship with God. He was confident in his journey towards heaven after his cancer diagnosis. Kees was a fine example of faith in God to all his family and has led us by example. He was a pillar of strength to his family, embodied in a 6 foot 4" frame. He was a gentle leader to his crew of girls, and particularly to Ellen, through their journey of immigration, love, marriage, children, grandchildren and old age.

Left: Kees and his girls on a holiday to warmer climate;
Right: Kees and Ellen check out the potato crop.

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Potato growers can rise up against disease like never before thanks to Veltyma® fungicide. It combines the enhanced performance of Revysol® and the proven **Plant Health Benefits**[1] of pyraclostrobin for optimal protection against early blight, black dot and brown spot. Visit **agsolutions.ca/veltyma** to learn more.

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[1] **Plant Health Benefits** refer to products that contain the active ingredient pyraclostrobin.

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Optimizing Cover Crops After Potatoes

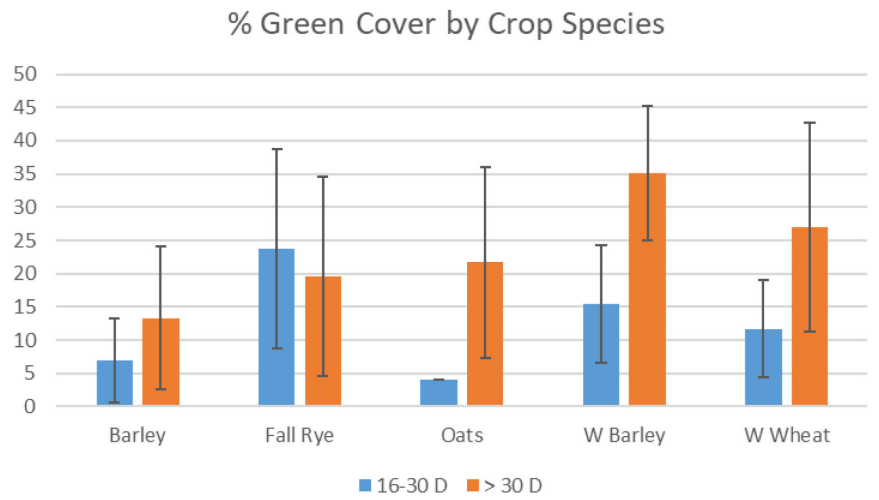
Ryan Barrett, Research and Agronomy Specialist

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 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 a lot of 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 was 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 was particularly interesting in this trial, as winter barley has not been often grown in Prince Edward Island previously. However, when we followed up with the fields where winter barley 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



This graph shows the percentage of green cover for five different cover crop species, averaged across multiple field trials over three year. The percentage of cover was generally better for the vernal cereal species.

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% increase in seed cost very marginally improved percent cover, if at all. This would lead us to recommend a lighter seeding rate for these spring cereals but with as early of a seeding date 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, with 2019 (42.5 g) and 2020 (36.9 g) have much more soil accumulated in the splash pans than 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.

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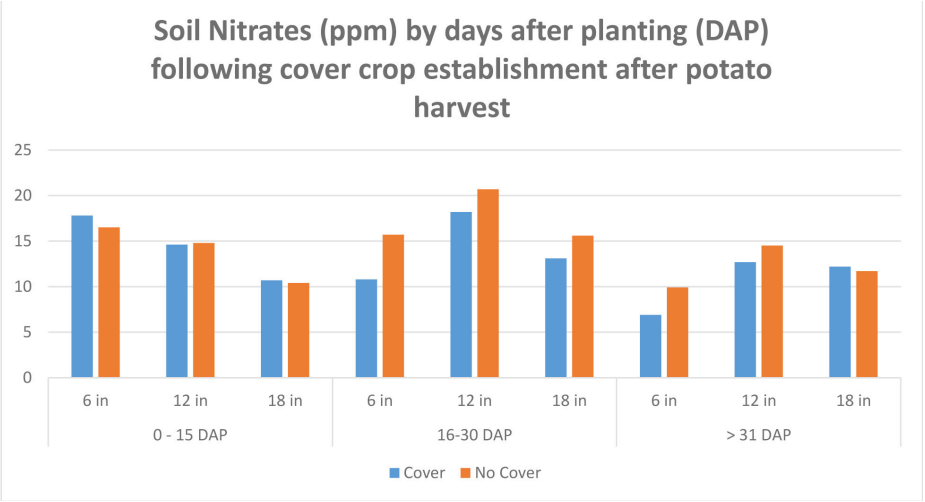
One of the limitations of this trial that we acknowledged from the beginning was that growers are very busy during harvest, and it can be challenging to propose and implement multiple treatments. Growers were more willing to entertain comparing different species or different rates than different seeding dates, as that would require a second trip to the field. 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 like corn or soybeans or a full season cover crop, but more of an issue ahead of barley or oats. Our data has shown in this project 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 the cover crop to winterkill 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



After 0-15 days after planting, the cover crops had generally not grown enough to uptake many soil nitrates, so levels remained similar between treatment and control. However, after 16 days, we we a trend toward lower soil nitrates in the cover crop treatments, indicating that in as little as two weeks, a cover crop can take up significant nitrate, keeping that nitrate from being lost over winter by leaching.

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 like 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, and their interest and cooperation was 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 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.

Investigating Biofumigation to Control Potato Early Dying

Ryan Barrett, Research and Agronomy Specialist

For many years, there has been interest in evaluating the use of mustard for control of soil-borne pests and diseases, including potato early dying (PED), common scab, wireworm, and more. Research done by AAFC in PEI has repeatedly shown that use of mustard as a biofumigant crop has reduced wireworm damage in potatoes. What has been harder to establish is what affect mustard crops have on pathogens like *Verticillium* or plant parasitic nematodes. As PEI potato farmers do not have access to chemical soil fumigation, there is an interest in assessing whether biofumigation with mustard is an effective option. There has been some work done on using both conventional brown mustard as well as specially bred high-glucosinolate varieties of mustard for biofumigation in PEI; however, these trials sometimes provided conflicting results and lacked replication. Therefore, there was an interest from the AIM Soil Working Group to set up a multi-year trial evaluating the use of a high-glucosinolate mustard variety compared with a standard crop and with a conventional brown mustard variety.

Starting in 2020, three farms had Caliente Rojo mustard/arugula mix planted in comparison with other crops, including a check crop that is normally seen to be neutral for *Verticillium* and nematodes (i.e., barley, ryegrass). Those three fields were then planted to potatoes in 2021.

In 2021, three additional fields were established for this trial:

- 2021-D: Treatments: Caliente Rojo, brown mustard (cv. Centennial), barley (check). After all three treatments were incorporated, sorghum sudangrass was planted as a cover crop. 2022 potato variety: Prospect.
- 2021-E: Treatments: Caliente Rojo, brown mustard (cv. Centennial), buckwheat, sorghum sudangrass/forage pearl millet mix, timothy (check). No cover crop planted. 2022 potato variety: FL2155
- 2021-F: Treatments: Caliente Rojo, brown mustard (cv. Centennial), ryegrass. No cover crop planted. 2022 potato variety: potatoes not planted.

Caliente Rojo mustard/arugula mix was obtained from High Performance Seeds of Washington State. This was an 80% mustard, 20% arugula (Nemat variety) mix. Seeding was done in late May and early June. Each grower was provided enough seed to plant approximately 10 acres of Caliente Rojo mix, in addition to the other crop treatments. At the recommendation of the seed supplier, the two mustard treatments also received between 100-125 lbs/acre of nitrogen and 20-25 lbs/acre of sulfur at

planting. For the two mustard treatments, growth and maturity was relatively rapid. Mowing and incorporation was done between 45 and 55 days after planting, based on weekly monitoring with regard to biomass progression and seed pod development. Immediately before potato planting in the spring of 2022, soil testing was conducted for soil chemical analysis, soil health analysis, *Verticillium dahliae*, and root lesion nematode counts. In the fall of 2022, four 10-foot strips with an equal number of potato plants were harvested in two mustard treatments, growth and maturity was relatively rapid. Mowing and incorporation was done between 45 and 55 days after planting, based on weekly monitoring with regard to biomass progression and seed pod development. Immediately before potato planting in the spring of 2022, soil testing was conducted for soil chemical analysis, soil health analysis, *Verticillium dahliae*, and root lesion nematode counts. In the fall of 2022, four 10-foot strips with an equal number of potato plants were harvested in each treatment. Potato varieties planted in 2022 were Prospect and FL-2155. One field ended up not being planted to potatoes due to lack of available seed in the spring of 2022, so no harvest results are available for this field. Prospect is known to be somewhat resistant to *V. dahliae*; however, it is susceptible to common scab, so mustard biofumigation is still very interesting in this case. FL-2155 is a late maturing chip variety with high tuber set, and resistance to *V. dahliae* is more unknown.

Both Fields E and F had starting pH levels that were lower than recommended by the Caliente Rojo seed supplier, as at low pH levels, the glucosinolates can breakdown into nitriles rather than isocyothanate gases. pH variability within field was low to moderate. Fields D and F would be considered low for soil OM, while field E would be considered average for soil OM. There was very little difference in soil OM from year to year. There was not much difference in soil fertility within fields before or after the 2021 crop year.

For Active Carbon, no trend was detected across all three fields. For Soil Respiration, sizeable increases were detected for some of the forage species in fields E and F. Aggregate Stability generally declined in 2022 compared to 2021. The ranges of decline was generally similar across all treatments. Biological N Availability varied slightly by field. In Fields D and F, there was relatively similar rankings from 2021 to 2022, and the overall numbers are on the low end. For Field E, there was a large decline in BNA from 2021 to 2022 for the three "biofumigant" crops (buckwheat, Centennial Mustard, and Caliente Rojo mustard). This indicates that there is less nitrogen to be available to the potato crop in 2022 in these treatments.

Field D would be considered high for populations of both *V. dahliae* and root lesion nematodes in spring 2021. *V. dahliae* counts were relatively consistent across the field in 2021 and did not appreciable change in 2022. Root lesion nematode counts appeared to decrease slightly in the Centennial mustard treatment but increased substantially following Caliente Rojo. In Field E, starting values for *V. dahliae* were a bit lower in 2021 but increased across all treatments in 2022, which is surprising. Nematode counts did not appear to change much year over year, but there were much higher counts in the sudangrass/pearl millet treatment area, both before and after planting of the cover crop. Number also remained high following the timothy/clover treatment (check). In Field F, starting values for *V. dahliae* were comparatively lower and remained low following 2022 spring sampling. Overall, there are no obvious trends with regard to the effect of either mustard crop on suppression of either *V. dahliae* or root lesion nematodes. In Field D there is no appreciable difference in marketable yield across the treatments. In Field E, there is no statistical difference in yield or quality among the treatments. While there is a lot of variability in specific gravity, only one composite sample was analyzed per treatment. Specific gravity readings are extremely high, but understandable for a chip variety. All of the total yield means are within 17 cwt/acre, indicating that there is no appreciable difference between the treatments in yield.

In the five fields were part of this study from 2020 to 2022, only one field showed a statistically significant increase in marketable yield following mustard biofumigation. This was the field with the highest starting population of *V. dahliae*, a pH close to 6.0, and a *Verticillium*-susceptible variety (Russet Burbank). The other fields in the study seem to indicate that when inoculum is not very high, or pH is low, or when a somewhat resistant variety is grown, there may not be a significant impact of using mustard as a biofumigant crop in PEI.

The research team would like to thank our participating growers, Steve Watts of Genesis Crop Systems, High Performance Seeds for providing Caliente Rojo mustard seed, and Dr. Judith Nyiraneza and Morgan McNeil for their assistance with data and statistical analysis.

New irrigation calculator developed to help Prince Edward Island farmers water crops more efficiently

Water is the lifeblood of our earth and essential to the survival of the many crops that Canadians eat every day. Water is also a limited resource, especially during dry periods, which are becoming more frequent due to climate change. On Prince Edward Island (PEI), rainfall events are happening less often during the summer so some Island farmers use irrigation to supply crops with additional water to help them grow. Water used for irrigation on PEI is mainly sourced from groundwater, a finite resource. This poses an important question on water usage – how can farmers know how much water their crops needs and when they need it?

It's a science that Agriculture and Agri-Food Canada Research Scientist, Dr. Yefang Jiang, has spent the last four years studying as part of the recently completed Living Lab – Atlantic project – a collaboration with farmers and scientists where research is completed on real farm fields to help increase adoption of environmentally friendly farming practices.

Dr. Jiang studied how scheduling supplemental irrigation, only when the crop needs it, impacted potato yields on several PEI farms from 2019 to 2022. His approach looked at moisture levels in the soil and which level provided the optimal environment for increasing potato yield and quality.

"Less moisture in the soil means the potato plant can't effectively pull water and nutrients from the soil and that reduces yield and quality. However, if soil moisture is too high, it can reduce yield and quality by damaging the potato root system. Finding the right balance of soil moisture helps potatoes grow and also reduces water usage."

He found that irrigation scheduling wasn't just determined by the moisture in the soil, it also must factor in the growth stage of the potato crop, soil type, as well as the short-term weather forecast. To help PEI farmers determine when or when not to irrigate, Dr. Jiang designed an online calculator with help from Dr. Morteza Mesbah, Kristen Murchison and Scott Anderson from AAFC to reduce the risk of over- or under-irrigating potatoes by accounting for all these factors. Living Lab – Atlantic partner, Ryan Barrett, from the PEI Potato Board helped test and provided feedback on the calculator to the team.

The calculator, available on the East Prince Agri-Environment Association (lead Living Lab – Atlantic partner) website, allows farmers to enter the soil type on their farm, growth stage of their potato crop, the current soil moisture level taken by a soil moisture metre, the seven-day rainfall forecast (in millimetres), as well as the efficiency of their irrigation system to provide water to the crop. For example, a low-pressure centre pivot with drop tubes applies water at 80 to 85% efficiency and a high-pressure pivot with impact nozzles is about 75% efficient. The calculator then provides an exact amount of water to apply to the field in millimetres and inches, or indicates that no irrigation is necessary if the crop has all the moisture it needs. Dr. Jiang explains that adopting use of the calculator will be easy for PEI farmers.

"They just need a hand-held soil moisture meter to monitor every few days, watch short term weather forecast, and then use the calculator to determine whether to water or not. Some farmers might be using less water than they need, where others might be using more than they need. The calculator will determine an optimal supplemental irrigation rate, and in turn will reduce water use."

The calculator will also help farmers increase their potato yield and quality as it provides information on the optimal moisture the crop requires at various growth

Dr. Yefang Jiang at a PEI farm research site for the supplemental irrigation project as part of Living Lab - Atlantic

stages. Dr. Jiang explains that he will work with four PEI farmers to collect more data to continually improve the tool. He is encouraging as many farmers as possible to start using the tool right away in order to use science to support responsible water use.

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To help PEI farmers determine when to irrigate or when not to irrigate, Dr. Jiang developed a simple calculator to reduce the risk of over or under-irrigating potatoes.

The calculator allows farmers to enter the soil type on their farm, growth stage of their potato crop, the current soil moisture level taken by a soil moisture metre, the seven-day rainfall forecast (in millimetres), as well as the efficiency of their irrigation system to provide water to the crop.

The calculator then provides a recommendation of the exact amount of water to apply to their field in millimetres and inches, or indicates that no irrigation is necessary if the crop has all the moisture it needs.

The Farmers & Fishers of PEI Donate 10,371.45 to PEI Food Bank

The Farmers & Fishers of PEI Donates $10,371.45 to PEI Food Bank from Canada Food Island Cookbook Royalties

Charlottetown, May 31, 2023 – The Farmers & Fishers of PEI, committed to promoting the island's rich culinary heritage, proudly presented a generous donation of $10,371.45 to the PEI Food Bank. The funds were raised from six months of royalties from the highly acclaimed Canada Food Island Cookbook.

The Canada Food Island Cookbook, a culinary masterpiece showcasing the diverse flavors and culinary traditions of Prince Edward Island, has captivated food enthusiasts worldwide. With a deep-rooted passion for supporting the community, all royalties from the cookbook to the PEI Food Bank. By purchasing a copy of the cookbook, individuals can contribute to the noble cause of alleviating food insecurity on the island.

In addition to the cookbook,there is an e-book version of Canada's Food Island Cookbook, ensuring that individuals can access the tantalizing recipes and support the PEI Food Bank from the comfort of their electronic devices.

Furthermore, the organization encourages Islanders to show their support by choosing or switching to a Canada's Food Island license plate. For every license plate purchased, $10 will be donated to the PEI Food Bank, bolstering their efforts to provide essential food supplies to those in need.

There is also the ease and convenience of donating online. Individuals passionate about making a difference can visit the PEI Food Bank's website at urhm.org and contribute directly to their cause. Every contribution, no matter the size, will contribute to ensuring that no one on the island goes hungry.

The Farmers & Fishers of PEI, in collaboration with the PEI Food Bank, are dedicated to strengthening the island community by comba ng food insecurity and supporting vulnerable individuals and families. Their unwavering commitment to uplifting the lives of their fellow Islanders through these initiatives has earned them widespread recognition and admiration.

For more information on how to support the PEI Food Bank please visit www.urhm.org or contact Mike MacDonald at (902) 892-7092.

The 2023 Potato Blossom Festival Awards

Potato Grower of the Year: Sweet Farms

Presented by Michelle Dyment and Greg Donald

Taylor Cahill, PEI Potato Ambassador

Kevin Dyment, Friend of the Potato Industry

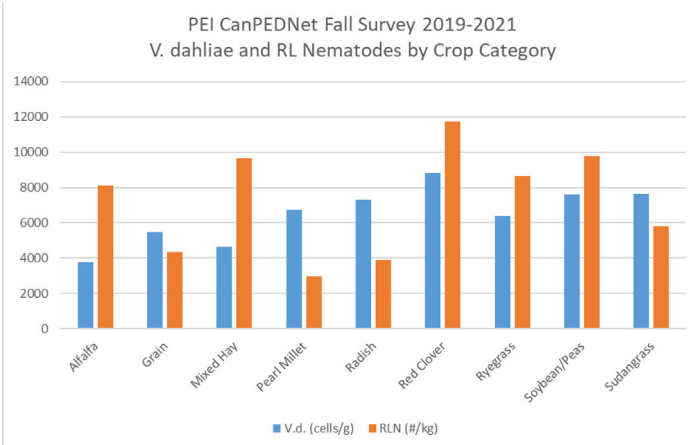
Canadian Potato Early Dying Network: PEI Results

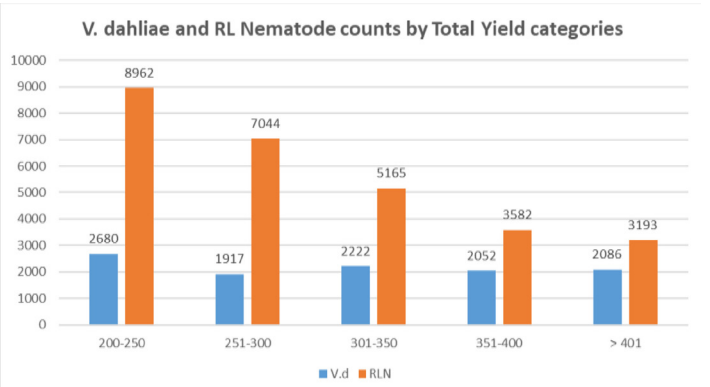
Ryan Barrett, Research and Agronomy Specialist

Potato early dying (PED) is a common disease in potato production. Susceptible varieties, short rotations, and a lack of proven products available to help reduce *Verticillium* and root lesion nematode populations all play a part in building significant inoculum in potato field across Canada, and in PEI specifically. While growers have been battling potato early dying for many years, there are still a lot of gaps in our knowledge of the disease, including the biology of the pathogens, how to best measure them, and what level of *Verticillium* and nematodes is associated with disease and yield loss.

Starting in 2019, the PEI Potato Board and PEI Department of Agriculture and Land together conducted three fall surveys for Verticillium and root lesion nematodes in 30 fields each year (2019, 2020, 2021) as part of the Canadian Potato Early Dying Network (CanPEDNet) project under the FVGC National Cluster. Eight fields were chosen the next year from these surveys (2020, 2021, 2022) for follow-up soil testing, foliar symptom monitoring, and yield samples.

Across the three years, the largest populations of *Verticillium dahliae* were found in fields that had previously grown red clover, sorghum sudangrass, soybeans/peas, and oilseed/tillage radish. Following alfalfaand small grains (wheat, barley, and oats), the lowest populations were noted. For root lesion nematodes, the highest populations were observed following red clover, mixed hay and soybean/peas. The lowest counts were observed following pearl millet, radish, and small grains. Root lesion nematodes were found in all of the examined fields across the three years, ranging from fewer than 2000 per kg of soil to more than 35,000, with testing done by the Potato Quality Institute lab in Charlottetown. An AAFC lab participating in the project indicated that 45% of surveyed fields had the *Pratylenchus penetrans* species present, with *Pratylenchus crenatus* being the most commonly found nematode species. *P. penetrans* constituted less than 15% of all root lesion nematodes in PEI soil. This is important, as *P. penetrans* is the species that has shown to be synergistic with *Verticillium*. Using current testing of "root lesion nematodes," we may be over-





estimating the number of nematodes that actually cause PED. More research is required to optimize testing methods to pull out just the *P. penetrans* numbers going forward.

The levels of *V. dahliae* detected showed a similar trend to nematodes, with comparable levels found in 2019 and 2020 before significantly decreasing in 2021. More than 90% of surveyed PEI fields had *V. dahliae* detected using qPCR. Using the same techniques, a trace amount of *V. alboatrum* was found in 8% of the studied fields. Colony forming unit (CFU) counts conducted by the ACS lab in New Brunswick and PCR results had a poor correlation.

Following three years of fall surveys, with more than 90 fields sampled, we generally saw the lowest root lesion nematode (RLN) numbers following pearl millet, radish, and grain crops. We saw the highest RLN number following red clover, soybeans/peas, and mixed hay. We saw the lowest *Verticillium dahliae* (V.d.) counts following alfalfa, grain, and mixed hay, while we saw the highest counts after red clover, soybeans/peas, and sudangrass. Somewhat surprisingly, the level of |*Verticillium dahliae* in the soil was relatively consistent regardless of the level of yield achieved in this trial. It may be that there is more than enough *Verticillium* inoculum around in most fields to cause disease, but only under the right conditions. The level of nematodes was much more strongly associated with the level of yield reduction. Therefore, it may be more valuable producers to know their root lesion nematode levels than their *Verticillium* levels when deciding on a management plan for their field.

There was a noticeable trend toward a reduction in V. dahliae levels between fall survey and spring follow-up samples for most fields; however, fall population density was significantly correlated with the spring density the following year. For populations of root lesion nematodes, the decline from fall to spring was often less, and the correlation between fall and spring was even stronger. This gives us confidence that fall sampling for *Verticillium* and nematodes will provide producers with valuable information when making field plans for the next year.

In each year, eight fields were selected for additional follow-up testing based on the results of the fall survey; however, some fields ended up being excluded from the final study due to a change in variety or other factors unrelated to PED.. In all three years, there was a significant difference in total yield between the low and high inoculum fields. There was noticeable variation in foliar symptoms in two of the three years, but on average, higher levels of foliar symptoms were associated with higher levels of yield reduction. Across the three years, the decrease in marketable yield varied from 11 to 19%. The largest yield difference was observed in 2022, which was a strong growing season in PEI with highest-ever provincial average yield.

Dr. Joe Kimpinski at AAFC previously conducted research on root lesion nematodes and established an economic threshold of 5000 nematodes per kg of soil, whereby a grower could expect to see yield loss. Using the same testing procedures in this study, average to above average total yields for Russet Burbank (greater than 350 cwt/ac) had root lesion nematode counts below 5000/kg of soil, while below average yields (less than 350 cwt/ac) had counts higher than 5000/kg of soil. Root lesion nematode counts seemed to be a better indicator of yield than *V. dahliae* in this study. It's possible that the majority of potato fields on PEI have a high *Verticillium* inoculum level and that additional mitigating circumstances, such as the presence of root lesion nematodes, may be needed to cause significant yield reductions. Another explanation is that the highly variable nature of current testing techniques makes it challenging to construct an accurate response curve of total yield versus *Verticillium dahliae* levels. Additional study will be required to improve testing and create the information required to predict yield response. ***Continued on page 23***

Reduced Nitrogen Rates on Seed Potatoes

Ryan Barrett, Research and Agronomy Specialist

Since the start of the AIM program, the Seed Working Group has been investigating ways to optimize the size profile of seed potatoes to necessitate less cutting of seed. Reduced seed cutting with larger average seed piece size has generally been associated with improved emergence, less seed wastage, and improved yields. The group has conducted research on a number of best management practices associated with reducing average tuber size and increasing the number of tubers per plant, including the use of gibberellic acid, tighter seed spacing, manipulation of physiological age, and use of ethylene gas in storage. There as also been some work done around reducing the amount of nitrogen applied at planting for seed potatoes. In these past studies, there has been no reduction in yield with the reduction of nitrogen; in fact, we have seen some small increases in yield and tuber number at lower rates of nitrogen. Therefore, it was requested to continue this work in 2022 with some of the newer varieties being contracted by Cavendish Farms instead of just with legacy varieties such as Russet Burbank and Shepody.

Four fields were set up with reduced nitrogen trials in 2022 across two farms. At a farm in West Prince (WP), we set up two trials on seed fields. Varieties evaluated were Dakota Russet and Alverstone Russet. For both varieties, the standard nitrogen rate was 100 lbs N per acre, applied in furrow at planting. The treatment rate was 80 lbs N per acre applied in-furrow. This fertilizer was specially blended for the trial, ensuring that the P, K, and other nutrients were the same between treatment and control, with nitrogen as the only nutrient reduced. Both fields were in an alfalfa/timothy forage mix in 2021, so there would have been some nitrogen credit coming from the alfalfa for the 2022 potato crop.

On the WP Dakota Russet field, there was significant foliar injury evident in July and August. Samples sent for analysis were inconclusive; however, the level of foliar injury was relatively consistent across the field. Therefore, we do not feel that this foliar injury would bias the results of the trial in either direction. For both WP trials, the low N treatment consisted of 18 rows in the middle of the field, with the conventional N control filling the remainder of the field. At harvest, four 10-foot samples were dug from each of the low N treatment and control in the same part of the field to reduce the effect of natural in-field variability.

At a field in East Prince (EP) we set up two trials on an irrigated seed field. Varieties evaluated were Dakota Russet and Mountain Gem Russet. For both varieties, the standard nitrogen rate was 177 lbs/ac N, applied in-furrow at planting. The treatment rate was 145 lbs/ac N applied in-furrow. In this trial, the total fertilizer blend was reduced by 18%, so P, K and other nutrients were also reduced by 18%; however, given the relatively strength of this field, it was not felt that this reduction would have a negative impact on yield or quality. Sorghum sudangrass was grown in this field in 2021, so it was anticipated that there would be a limited nitrogen credit coming from the

There was no difference observed in the foliage of any of the four reduced nitrogen trials in 2022, including this field of Alverstone Russets in West Prince.

Potato Yield and Quality:

West Prince – Dakota Russet

Treatment	Tubers/ Plot	Specific Gravity	1-4 oz lbs/10 ft	4-7 oz lbs/10 ft	> 7 oz lbs/10 ft	1-7 oz seed (cwt/ac)	Total Yield (cwt/ac)
100 lbs/ac N	64.5	1.080	2.9	11.6	6.6	188.5	273.7
80 lbs/ac N	69.0	1.080	3.4	12.0	7.1	200.9	292.2
Difference	+4.5	0	+0.5	+0.4	+0.5	+12.4	+18.5

West Prince – Alverstone Russet

Treatment	Tubers/ Plot	Specific Gravity	1-4 oz lbs/10 ft	4-7 oz lbs/10 ft	> 7 oz lbs/10 ft	1-7 oz seed (cwt/ac)	Total Yield (cwt/ac)
100 lbs/ac N	90.3	1.083	4.8	11.9	14.0	217.1	398.5
80 lbs/ac N*	89.2	1.086	5.0	11.8	13.5	218.6	394.1
Difference	-0.9	+0.003	+0.2	-0.1	-0.5	+1.5	-4.4

Grading results from two reduced nitrogen trials in 2022. There was not significant difference in yield or size profile when we reduced applied nitrogen by 20% for Dakota Russets and Alverstone Russets. There was a slight trend toward increased tuber number in the Dakota Russets with reduced nitrogen, but it was not statistically significant.

previous crop. Planting date was May 20th, 2022 and top-killing date was September 13th. Harvest samples were dug on September 30th, 2022. For both EP trials, the low N treatment consisted of 12 rows in the middle of the field, with the conventional N control filling the remainder of the field. At harvest, four 10 foot samples were dug from each of the low N treatment and control in the same part of the field to reduce the effect of natural in-field variability. For all four trials, the hand-dug potato yield samples were graded to a seed standard. Seed was divided into four size categories (1-4 oz, 4-7 oz, 7-10 oz, and > 10 oz.). One specific gravity reading was determined from a pooled sample from the four samples per treatment. The total number of tubers per plot was also recorded.

At none of the four trial sites was there any statistical difference between treatment or control for any yield or quality variables. This gives us confidence that a 20% decrease in nitrogen on these farms did not result in a reduction of yield. We did not see the anticipated increase in tuber numbers with the reduced nitrogen treatment on these trials. It may be that the total nitrogen available to the crop may be sufficiently high even at the lower rate to mask any effect. The 2022 growing season was quite favourable in both of the regions where these potatoes were grown, and these fields were not under moisture stress. No difference was observed in the foliage between treatment and control during the growing season. In all four trials, there was still a significant amount of tubers greater than 7 ounces in size, tubers that will need to be cut more than once during seed cutting. Further reductions in nitrogen may help to decrease the size of these tubers and increase tuber numbers along with other management practices, such as tighter spacing and use of gibberellic acid. Thank you to the two farms participating in this trial this year. Thanks also to Steve Watts of Genesis Crop Systems for assisting with grading of samples for this trial.

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The research team would like to thank the many Island producers who allowed us access to their fields, both for the survey as well as the follow up testing. Through this project, we gained valuable knowledge about the levels of Verticillium and nematodes we see in PEI, what rotation crops are associated with these pathogens, and what level of yield reduction we can expect from PED under a range of growing conditions. More work is required to improve testing methods and better understand variety resistance to PED, but we know a lot more about potato early dying in PEI and in Canada than we did at the start of this project.

Thank you to Dr. Mario Tenuta (University of Manitoba), Dr. Dahu Chen (AAFC Fredericton), Sebastian Ibarra and Eileen Beaton (PEI Dept of Ag) and Morgan McNeil for their part in making this project successful.

Upcoming Events & Program Deadlines

Please call the Board at (902) 892-6551 for further information on any of these events.

September

Sept 21: PEI Dept of Agriculture Regenerative Agriculture Tour. Kingston View Farms and Barnyard Organics

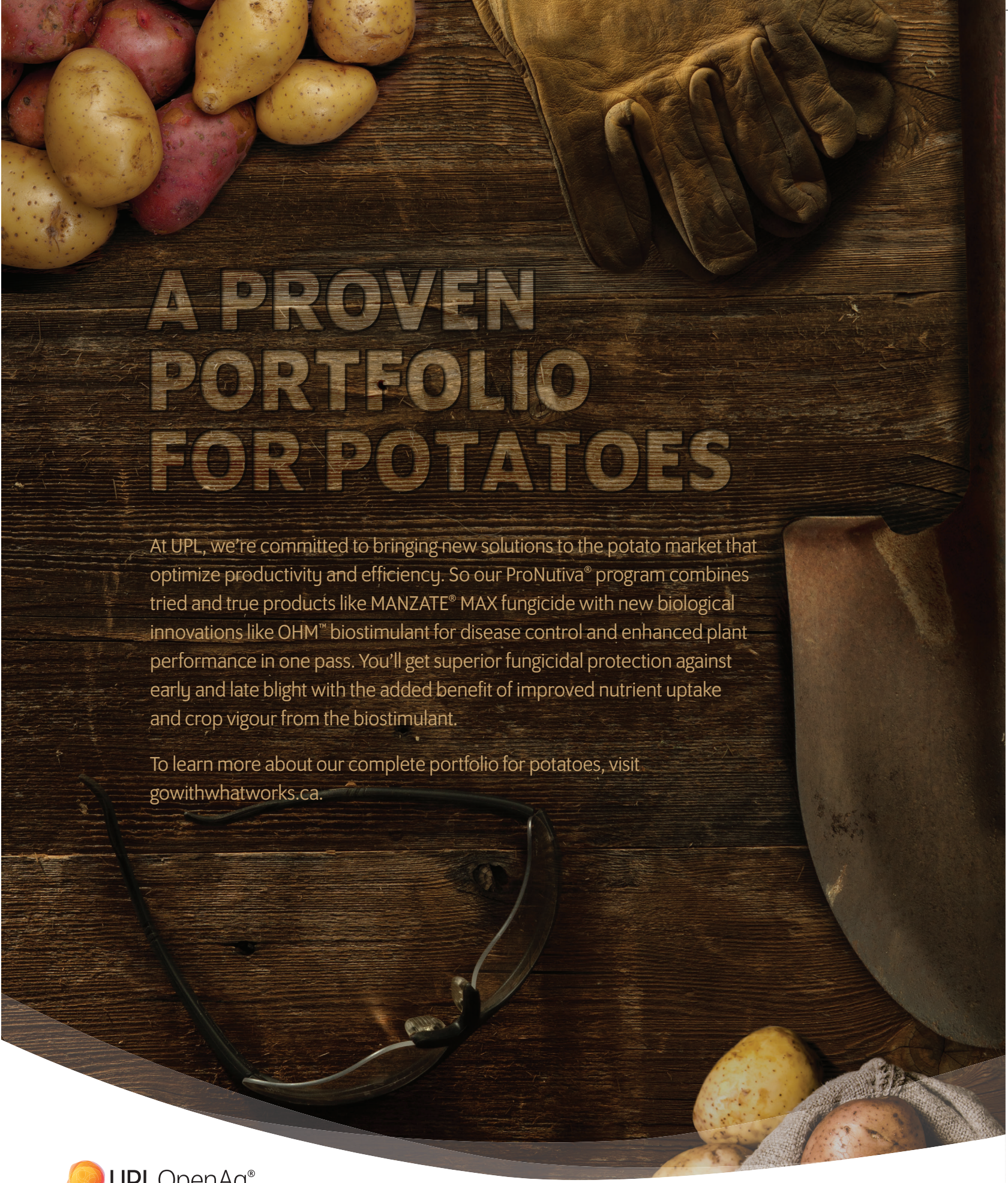
November

Nov 22: PEI Potato Board AGM, PEIPB Office

Nov 24: PEI Potato Board Annual Banquet, Delta Hotel

February

Feb 1: Potatoes New Brunswick Conference, AYR Motor Center, Woodstock , NB



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