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stem-end chip defect*

PRODUCTION OUTLOOK

Canadian growers
are optimistic

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FEATURES

04 PRODUCTION OUTLOOK
Despite a late start to the planting season in most potato producing areas in Canada, growers are optimistic.

10 VINE KILLING: TIMING IS EVERYTHING
Are you up to speed on the latest information? Here's what the experts had to say about vine killing.

13 COMMUNITY AND SCIENCE STRENGTHENS INDUSTRY
Long-time Potato Association of America members, Robert Thornton, Larry Hiller and Rich Novy open up about the organization: where it has been, where it is now, and where it's going.

18 2019 PAA SYMPOSIUM UNITES AND SUSTAINS INDUSTRY
The PAA's Marketing and Utilization section takes on trending topics and illustrates marketing is the tie that binds the potato industry.

20 LOCAL ARRANGEMENTS COMMITTEE HITS IT OUT OF THE PARK
What's the local scene for this year's PAA Annual Meeting? Organizing committee co-chairs Tracy Shinners-Carnelley and Vikram Bisht give the goods.

22 RESEARCH GROWERS NEED TO KNOW ABOUT
A look at some of the practical results from the latest potato research being presented at the PAA meeting this summer.

26 PAA HONORARY LIFE MEMBERSHIP AWARD
At the 103rd PAA annual meeting, four extraordinary researchers, Kathleen Haynes, John Nordgaard, Nora Olsen and Peter VanderZaag, will be honoured for their contributions to the industry. Here are their stories.

36 SUGAR END DISORDER AND STEM-END CHIP DEFECT
Mike Thornton and Paul Bethke discuss stress factors and management of these two tuber disorders.

48 GROWER SPOTLIGHT
Kehler Farms Ltd.



DEPARTMENTS

- 02** FROM OUR DESK
- 34** INSIDERS
- 40** EYE ON THE NATION
- 43** MARKET NEWS
- 44** INDUSTRY NEWS
- 47** WORLD REVIEW

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Kehler Farms Ltd.
Photo: Sandy Black





Industry and Producer Engagement Increasing

EXCITEMENT IS IN the air as Manitoba gets ready to host the 103rd Potato Association of America Annual Meeting in Winnipeg at the end of July.

It's a time for the sector's scientific branch to share research information about all facets of the potato industry, to recognize members who have made significant contributions to the sector, and to nurture and mentor upcoming researchers. It's also an opportunity for all industry stakeholders, including producers, to network and socialize.

In short, there's something for everyone at this annual meeting. Producers will find the Industry Day on July 30 particularly helpful as the sessions are largely about management practices and topics they will find of interest.

While discussing projects and collaborations with PAA members, I couldn't help but wonder about the shifts taking place within the industry with respect to how research is funded and carried out.

Twenty years ago, Tracy Shinnners-Carnelley's position of vice-president of Research and Quality for Peak of the Market — a grower-owned, not-for-profit vegetable supplier — didn't exist. According to Shinners-Carnelley, this highlights a positive change toward a higher level of industry engagement.

This is due to the shift, says Shinners-Carnelley, in the way funding is allocated for research, and the common requirement to have industry involvement and fund-matching, and in many cases an increasing amount of funds. There is a need for industry to be identifying and supporting what research projects are going forward, she continues.

Additionally, whether real or perceived, the decline of resources for traditional types or groups of research means it's up to industry, in many cases, to help initiate research and move it forward, as well as help in its coordination, she adds.

"When we look at industry's role, there is certainly an increase in conducting and delivering research programs, but also in coordinating it. In some cases, grower groups are not actually doing the research, but they're playing a key role in coordinating research partners doing the work and also on funding the research. That is certainly evidenced in the way that [Agriculture and Agri-Food Canada] has been funding agricultural research in the last number of

years, and moving to the AgriScience Clusters," she says.

Those industry clusters are applied for, or held by, industry partners like the Canadian Horticulture Council, and "industry plays a key role in identifying what the research priorities are and pulling together the complement of scientists and industry to help support, move forward, and work on the knowledge transfer piece," she says.

"It is very positive that industry is in the driver's seat but at the same time it is a lot of work to coordinate these large-scale projects that have many collaborators. It's just simply logistics."

Now that industry is taking on a larger role — as applicant, proponent and coordinator — it will seek ways of making the process more efficient.

"That full continuum of identifying, developing, funding and delivering research results has its challenges, and as we get more familiar with this way of delivering research, it will get smoother."

As the involvement of industry increases in driving research, research is playing a more prominent role within industry. There is also increasing producer engagement in research.

The number of industry participants attending the PAA annual meeting has also increased over the past few years, says Shinners-Carnelley, who is co-chair of the 2019 PAA Local Arrangements Committee. "When we look at our numbers of industry participants coming to PAA, that's another sign the interest in research is continuing to build," she says.

And bringing industry and the research community together at events like the PAA annual meeting can only strengthen the industry.

"Within that PAA group, we have such a mass of expertise and their knowledge is immense. When we all come together, it is a resource and it is a network and the association ties us all together," says Shinners-Carnelley.

I hope to see you at PAA's Industry Day this summer! ○

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2019 Potato Crop Outlook

Even with unseasonably cold, wet conditions this spring and a slow start to the season, growers are feeling optimistic about 2019.

BY MARK HALSALL

DESPITE A LATE start to the planting season in most potato producing areas in Canada, growers are generally optimistic about the prospects for this year's crop. However things turns out, it will most likely be an improvement on what, for many Canadian producers, was a dreadful end to the 2018 harvest season, when unseasonably cold, wet weather led to thousands of acres of potatoes being left in the ground.

According to Kevin MacIsaac, general manager of the United Potato Growers of Canada, producers in New Brunswick, Prince Edward Island, Quebec and Manitoba have all applied for government assistance under the AgriRecovery program as a result of last year's discouraging harvest.

MacIsaac, along with provincial grower representatives across Canada, spoke to *Spud Smart* in late June about how the 2019 crop was shaping up.

MacIsaac says when planting started, the weather was generally cold and wet in most potato areas in Eastern Canada, while in most of the western provinces it was cold and dry.

The result, he said, was planting delays for the majority of producers — but MacIsaac did refer to one silver lining.

"Because the soil was cooler than normal in most planting areas, we had very little seed piece decay," he said. "Normally, we have some wet rot that ends up being in fields that you have to replant. We see very little of that this year in almost all of the provinces."

NEW BRUNSWICK

A cold, soggy start to the season in New Brunswick meant planting there was a little later than usual, although Matt Hemphill, executive director of Potatoes New Brunswick, maintains it may take time to consider a "new normal" when it comes to getting potatoes in the ground.

"I don't know how long we're going to talk about it being a cold, wet spring, because cold, wet springs seem to be the new norm," said Hemphill.

"If you look at the last three or four years, we've planted the crop up until the first week of June," he added. "It's just the way it is now. Our summers have been moved forward a month."

Potato planting in New Brunswick started in mid-May and wrapped up by June 7. Hemphill said seed quality was very good and there were great growing conditions throughout the province in June.



Potato planting at Desjardins Seed Farm in Drummond, N.B.

PHOTO: DESJARDINS SEED FARM

"It's been ideal so far," he said, adding that unpredictable weather events like summer hail and excessive rain are always a concern for Maritime potato growers.

"When the hurricanes start coming up the Eastern Seaboard, then we always question how much precipitation that's going to bring. We don't need these four-to six-inch torrential downpours. That's where the problems occur," Hemphill explained.

"Those are always unknowns at this point, but I'm feeling pretty optimistic about the crop so far."

Hemphill said the total potato acreage in the province, which was 54,000 acres in 2018, is expected to climb 1,500 to 2,000 acres this year as a result of strong demand for New Brunswick's processing potatoes, both at home and from surrounding provinces.

PRINCE EDWARD ISLAND

In Prince Edward Island, potato planting was delayed due to cold and wet soil conditions in April and May, and it didn't wrap up until the second week of June.

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"We're probably a week behind where we'd like to be, but this time of the year, there is loads of time to make it up," said Greg Donald, general manager of the P.E.I. Potato Board.

He added growers benefitted from warmer weather that started during the last two weeks of planting. That, combined with timely rain in June, resulted in a good start to the growing season on the Island.

"We just need some heat now and sun, and we'll be off to the races," Donald said.

P.E.I.'s potato acreage has hovered around 85,000 acres the past 10 years, and Donald says he doesn't expect to see much change from last year's total of 86,000 acres.

QUÉBEC

It was a cold and wet spring as well in Québec, where planting was delayed seven to 10 days in most areas.

Clément Lalancette, director general of le Fédération des producteurs de pommes de terre du Québec, said early season crop development was uneven, with potato fields in warmer parts of the province progressing more quickly than those in colder areas.

Maclsaac said that some Québec growers needed to replant their fields due to seed piece decay in wetter soils.

According to Maclsaac, the potato acreage in Québec, which totalled 42,700 acres in 2018, will likely see an increase of 1,000 acres for processing potatoes and another 1,000 acres for fresh.

ONTARIO

Inclement spring weather also caused seven- to 10-day planting delays in many areas in Ontario.

Kevin Brubacher, general manager of the Ontario Potato Board, said potatoes started going into the ground in early March, but growers were slowed down considerably by the cold and wet conditions.

Brubacher said while potato planting ended very late in Ontario compared to most years, growers were encouraged by warmer and dryer weather in June.

"We're going to have a few acres that were drowned out or suffered some rot in the field, but for the most part, everything has turned around and looks pretty good," he said.

It's expected 34,000 acres of potatoes would be planted in Ontario this year, around the same total acreage as in 2018, Brubacher added.

MANITOBA

In Manitoba, it was a dry spring but somewhat colder than normal. Dan Sawatzky, manager of Keystone Potato Producers Association, said planting started slightly later than the previous year, but by mid-May, most of the potatoes were in the ground. The cold ground conditions, however, did have an impact on emergence.

"Some of the early potatoes were in the ground longer than you would have liked, up to four weeks and possibly even five weeks before they emerged," Sawatzky said. "The potatoes planted later emerged more quickly than the early ones, so the emergence window was confined to about two weeks or so."

Sawatzky said as a result of the dry soil conditions, almost no seed rot had been reported.

"I think we've had a fairly decent start. The stand seems good," he said.

Most producers in Manitoba irrigate their potato fields. Sawatzky said while it



Potato planting at Rollo Bay Holdings in Souris, P.E.I.

continued to be quite dry in Manitoba into June, irrigation reservoirs in the province were refilled during the spring thaw for the most part.

Manitoba's total potato acreage, which was just over 64,000 acres in 2018, is expected to increase substantially this year.

According to Sawatzky, the province's processing acres are expected to increase by approximately 5,500 acres in order to feed the newly expanded Simplot plant in Portage la Prairie, Man., that opens in January 2020.

Maclsaac said an additional 400 acres of fresh potatoes are also expected to be grown in Manitoba in 2019.

SASKATCHEWAN

Maclsaac said he didn't expect there to be much change in Saskatchewan's potato acreage, which was 6,300 acres last year.

He described the province as "unbelievably dry," and said by mid-June, most potato growers were still waiting for their first rainfall. Maclsaac added the lack of moisture was already having an adverse effect on canola and other field crops being grown in Saskatchewan.

"Some very cool, wet weather delayed the beginning of our planting season, but when conditions improved, most growers were able to plant their acres within three to four weeks under near-perfect conditions," says Matthew Lawless, president of the Saskatchewan Seed Potato Growers' Association.

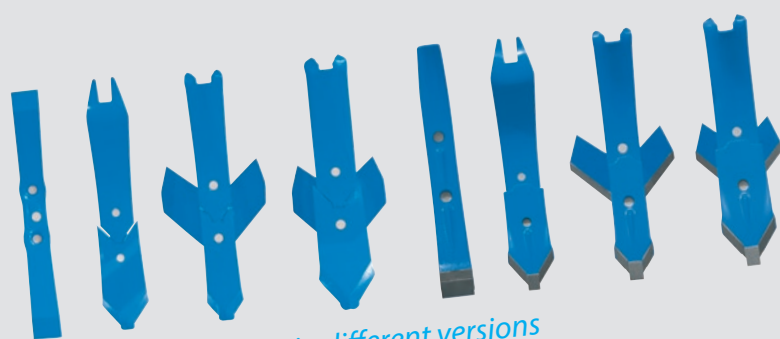
Most Saskatchewan growers rely heavily on irrigation as their main source of water, and with the significant drought in the province, potato crops have been heavily irrigated since the middle of May.

"Some timely rainfall has occurred recently, and favourable weather has kept pest pressure down. Table and seed crops are progressing nicely and growers are optimistic about the crop's potential this year," says Lawless.

ALBERTA

In Alberta, the weather was very cold and dry at the start of planting, resulting in delays up to 10 days for some farmers, according to Potato Growers of Alberta executive director, Terence Hochstein. He said as of the end of June, the crop looked to be in good shape.

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Hochstein said as a result of four years of marginal snowfall and spring runoff, combined with very little in-season rain, the irrigation reservoirs in southern Alberta are starting to be taxed at an alarming rate.

He added some irrigation districts in the South Saskatchewan River basin have put their members on allocation, meaning growers in these areas may need to pull water off crops like cereals in order to provide adequate irrigation for their potatoes and other high-value crops.

Last year, the potato acreage in the province was 55,300 acres, but with the opening of the new Cavendish Farms plant in Lethbridge, Alta., in August, there will be a major boost in the number of processing potatoes grown in Alberta this year.

Hochstein said this year's total should be around 61,000 acres, which includes an additional 4,500 or so acres of processing potatoes needed to feed the Cavendish plant. He added Alberta producers are expected to grow around 1,200 more acres of seed potatoes in 2019, and fresh production will likely decline a bit as more potato acres are shifted over to processing.

BRITISH COLUMBIA

Unlike the situation in some other parts of the country, B.C. potato producers generally enjoyed great weather throughout the spring.

Most potatoes were in the ground by May 20, and Andre Solymosi, general manager of the B.C. Vegetable Marketing Commission, said planting generally went off without a hitch.

"It's gone well," he said. "We've had a good stretch of weather and it's continuing."

Solymosi said June was a little dryer than normal, but that wasn't a major concern for producers with potatoes on irrigated acres.

The potato acreage in British Columbia is expected to be close to last year's total of 6,600 acres. ○

"I don't know how long we're going to talk about it being a cold, wet spring, because cold, wet springs seem to be the new norm."

MATT HEMPHILL



Early potato crop at Zeimack Farms in Taber, Alta. PHOTO: POTATO GROWERS OF ALBERTA



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Vine Killing: **Timing is Everything**

Are you up to speed on the latest information about vine killing? Here's what the experts had to say. BY JIM TIMLICK

▶ AS ANY POTATO GROWER will attest to, a successful growing season often comes down to what transpires below the soil's surface. A field full of healthy, robust tubers usually translates into a positive bottom line.

As significant as the happenings below ground may be to growers' fortunes, events above the surface can have an equally big impact on just how fruitful their season may be. Perhaps there is no better example of that than vine killing, a harvest aid procedure used to reduce the amount of potato vines, limit late blight tuber infections, control tuber size, reduce skinning and minimize the spread of infection by aphids on seed potato crops.

Benoit Bizimungu, a research scientist with Agriculture and Agri-Food Canada (AAFC) in Fredericton and curator of the Canadian Potato Gene Resources collection, says vine killing, or top killing as it is often referred to, has been a standard pre-harvest practice in Canada for quite some time.

Just like any tool, Bizimungu says vine killing can be highly effective if used properly. There are essentially two methods of vine killing: mechanical (flailing, cutting or burning the stalk) or chemical (desiccation). In many cases, the two approaches are used in combination to help facilitate mechanical harvesting. However, top killing needs to be properly managed as it can cause stem-end discoloration and adversely affect the colour of some products such as French fries and potato chips.

IMPROVE SKIN SET

One of the primary reasons for using vine killing, according to Bizimungu, is that it can go a long way in helping to improve the skin set of most varieties of potatoes. That, in turn, usually means reduced skinning and bruising during harvesting.

"Top killing prior to harvest actually makes the skin better or tougher. That way you can have better quality in terms of less skinning and less bruising," he says. "You can also prevent other problems by having tougher skin and you can improve storage [capability] during the storage season."

In addition, he says, it allows control over the size of the tubers and can effectively determine the timing of a harvest. Once the stalk has been flailed or chopped and a desiccant applied, it can no longer supply nutrients to the tuber which substantially slows or halts any further growth.


Mark Butcher, an agronomist and crop consultant with Phoenix Agricultural Services in Argyle Shore, P.E.I., says vine killing is also an effective means of helping protect potatoes from some common viruses. For example, the green peach aphid is a highly effective vector of viruses into potato plants. By eliminating most of the green, leafy stalk, no virus transfer can occur, Butcher says.

Although vine killing is used by potato growers from coast to coast here in Canada, it is a little less commonly practiced in the West. That's due, in part, to the fact that a larger percentage of the potatoes grown in Western Canada are destined for processing and in some cases are harvested green to maximize yields. Another factor, Butcher says, is that farmers in provinces such as Manitoba and Alberta usually receive far less rainfall than their eastern counterparts and in most years they don't face major fungal concerns such as late blight.

WHEN THE TIME IS RIGHT

Timing is another important consideration when it comes to effective vine killing. It's recommended that most vine desiccants be applied at least 14 days prior to harvest. Experts also suggest that they be applied, whenever possible, when a plant is starting to show signs of senescence or natural maturing.

"Senescence is a good sign that you're entering into that time when it's okay to apply products to kill the crop down," Butcher says. "If plants are still actively growing and nowhere near senescence, it's much harder to kill them down using just a desiccant, often requiring multiple applications. Also, desiccants should not be applied if possible to a drought-stressed potato crop. Under these circumstances you can actually harm the quality of those potatoes."



A vine-kill research project at the Canada-Saskatchewan Irrigation Diversification Centre in Outlook, Sask. The middle rows show a two-row flailer in operation. On either side of the middle rows are plots that have been top-killed with Reglone applied at a previous date.

PHOTO: JAZEEM WAHAB

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Mark Butcher is an agronomist and crop consultant with Phoenix Agricultural Services in Argyle Shore, P.E.I.

“If people have it in mind that they’re going to want to harvest early they may have to make other adjustments in the fertility levels of those crops or when they plant those crops to ensure they’ve got the beginning of senescence. You can’t just do [vine killing] any time and expect to get a good result.”

While mechanical top killing and the tools used to do it haven’t changed much over the years, chemical desiccants and the methods used to apply them have evolved over time. Diquat, a non-selective type of herbicide with brand names such as Reglone, Dessicash, Diquash and Armory, is the desiccant of choice for many potato farmers. Other popular herbicides include carfentrazone-ethyl and endothall.

Butcher says the biggest change that has occurred regarding desiccation during the past several years is how chemicals are applied to potato plants. At one time, he says, growers used a higher application rate and attempted to kill the stem with a single pass. Today, they are far more likely to use an initial application of one-third or two-thirds of a full dose and follow that up with a second pass of the remaining amount of chemical four to six days later.

“You actually want the plant to die relatively slowly. You don’t want it to die too fast because you can have quality issues then. You can get excessive levels of diquat going into the tuber if you’re not careful, particularly under very dry conditions,” he says.

“Typically, how it’s evolved is they’ll go in with a slow [initial] rate ... just to start the plant down and then a week later they’ll come in with the rest of it to finish it off. One of the benefits is that if you kill the plant down more slowly, more of the sugars are converted to starch and in the French fry business that means you get better colours.”

BIOCHEMICAL INHIBITORS

Horticultural crops agronomist Jazeem Wahab, who works out of AAFC’s Saskatoon Research and Development Centre, says some of the newer chemical desiccants being used today work differently than those previously used by potato growers. Many of the newer chemicals are biomechanical inhibitors that go into the plant and essentially kill it from the inside rather than simply burning the outside the way some chemicals used to.

Regardless of the type of desiccant being used, it’s important for growers to pay attention to temperature and environmental conditions prior to applying it. Some desiccants are rainfast, but others can run off in rainy weather and lose much of their effectiveness. Conversely, some desiccants can be less successful if the conditions are too hot. They can also lead to stem-end discoloration if applied incorrectly or at the wrong time.

Wahab says growers should read the labels on any products prior to using them in order to make informed decisions about application rates and timing. He also suggests that growers use top killing as part of an overall management plan rather than in isolation.

“When you look at vine killing it is more than just vine killing. It’s also harvest management that goes right from the time to plant to how you manage the crop and how you get your crop out.” ◦

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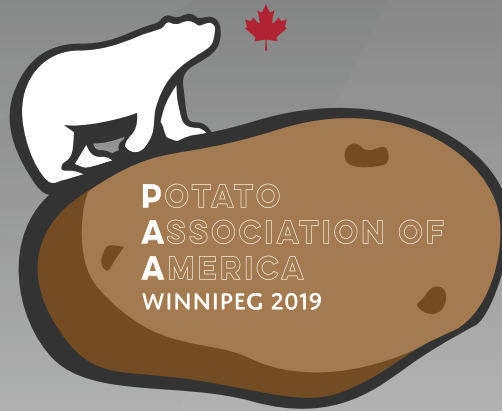
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Community and Science Strengthens Industry

BY KARI BELANGER

ROBERT THORNTON, an extension vegetable specialist and professor emeritus at Washington State University has been attending Potato Association of America (PAA) annual meetings since the early 1960s. He says the biggest reason he has maintained his membership for more than five decades is it keeps him honest.

“Every year is an opportunity to have your thinking questioned,” Thornton says. “You can stay isolated in your own area of concern and be very comfortable and effective. When you attend a meeting, you find out there are people with a lot of information you can use to do better what you thought you’ve been doing awful well already.”

The association was founded in 1913 by a handful of growers who identified the need for a specialized scientific interchange of information between individuals working on potato diseases and other issues.

“Disease was the biggest problem, and insects to some extent,” says Larry Hiller, WSU associate professor emeritus in the Department of Horticulture and Landscape. “Big challenges at that time were also potato marketing and potato storage,” he adds.

Those founding members funded many of the association activities out of their own pockets, laying the groundwork and establishing guiding principles for an organization still going strong 105 years on.

From its inception to the current day, the association has been a primary voice for potato science and has relayed science-based research to the industry helping it remain competitive, says Rich Novy, current PAA president and a research geneticist with the USDA Agricultural Research Service in Aberdeen, Idaho.

Research conducted by PAA members helps address emerging issues, says Novy. “You’re going to see, and this has always been the case with potato, either old diseases or pests that tend to resurge or brand-new ones in a given area,” he says. For example, Novy has recently participated in the submission of a new grant to continue research in the area of tuber necrotic viruses as potato mop-top virus and tobacco rattle virus become increasingly problematic to the North American potato industry.

To remain competitive internationally, adds Novy, the potato industry will need scientific information generated by PAA members to help in addressing problematic issues that detrimentally impact potato production and quality.

“The industry needs science-based research and data to aid in decision-making. PAA can contribute, especially where you have newly emerging diseases that could really impact the industry. As a science-based association, helping industry address pressing issues is something PAA does quite well,” says Novy.

This has been proven time and again by the accomplishments of the association’s members. One of the major contributions is new variety development, which is “solving some of the industry’s major problems,” says Thornton. More than 300 potato varieties have been developed and released by North American PAA members.

Cultivar development over the years has led to many advances in disease and insect resistance and quality-related factors, and the new potato cultivars being adapted to production sites and techniques are very instrumental to the success of the industry, says Hiller.

Novy, who is also a potato breeder geneticist with the Northwest (Tri-State) Potato Variety Development Program, says new varieties have been gaining more attention and greater acceptance.

“I’m really excited about this phase of the industry where, for example, Clearwater Russet and Blazer Russet, which were released by the Tri-State Program, were accepted by McDonald’s in 2016 for their fry production. Ivory Russet, another variety from Europe, was also accepted at the same time. Those were some of the first new potato varieties accepted by McDonald’s since we released Umatilla Russet back in 2000. Since 2016, three new varieties were accepted by McDonald’s and that impacts the industry as a whole.”

Further mapping and identification of genomic regions important for potato traits, such as cold sweetening and sugar end disorder resistance and disease and pest resistance, is moving ahead as well. Novy says a molecular biologist will be added to the research team at Aberdeen, which will add another dimension to the breeding program.

PAA scientists have contributed to all aspects of potato production. One such area in which major advances have been made, and close to Hiller’s heart,

is the physiological disorder internal brown spot. Large strides in harvesting, bruising, and impact reduction of potato drops and movement, have also been made, says Hiller.

Advances in the control of diseases, insects and weeds, and increased emphasis on producing high-quality potatoes, and the maintenance of specific gravity in French fries can also be attributed to association members.

“Then the whole area of potato storage, potato sweetening, potato darkening during chipping and French fry-making, those are all major changes and advancements. Obviously, there was progress made back in the early days ... advances in shipping and the marketability of the potato,” says Hiller.

“At this point the relevance of PAA is to relate to changes in society, consumption trends and market preferences, and to keep the science and advances in potato production and technology up to those expectations. We have to constantly be on the forefront looking at current trends in society and meeting those demands,” he says.

MULTIDIMENSIONAL NATURE

From plant physiology and pathology to insect pests, harvesting, handling, storage, marketing, and nutrition and utilization, it’s the multidimensional nature of the organization covering diverse scientific aspects that has made it so effective over the years, says Hiller.

“In a nutshell, anybody and anything that has something to do with potatoes can be part of PAA and get something out of our organization,” he says.

That includes producers. Information is distributed during PAA meetings or through producers’ state or provincial organizations on new crop protection products, growing practices, machinery harvesting parameters from seed cutting and planting through harvest, innovations in storage, marketing and utilization, and production and storage management guidelines for new potato varieties.

“Growers are on the forefront of science and technology when they are involved with PAA. They get the latest information to take back and put into their fields and their production practices,” says Hiller.

Four hundred and sixty-eight members from 25 countries and six continents make up PAA’s membership. Annual meetings over the past century have taken place across North America. The 103rd annual meeting will take place in Winnipeg, Man., and is

“We have to constantly be on the forefront looking at current trends in society and meeting those demands.”

LARRY HILLER



Larry Hiller is a Washington State University associate professor emeritus in the Department of Horticulture and Landscape.

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“It brings about a feeling of common interest and brotherhood among people who are professionally committed to the well-being of the potato industry, such as educators and scientists, who perceive their role in life is to help maintain a viable, economically-sound, environmentally-friendly, industry.”

ROBERT THORNTON

the 15th time a Canadian city has hosted the event. Meetings have also taken place in Vancouver, B.C.; Calgary, Alta.; Toronto and Guelph, Ont.; Quebec City, Que.; Fredericton, N.B.; and Charlottetown, P.E.I.

Holding meetings in various North American locations has strategic value, says Thornton.

“You become familiar with and acquainted with expertise that is not locally available, but can provide information on local issues. You have a cadre of expertise you can call on that’s beyond where your normal area of contact would be.”

That knowledge also includes individuals outside of North America, particularly Europe, Asia and South America, Thornton adds.

In fact, international participation is increasing, says Novy. “Our association is welcoming of that international exchange and we try to promote it.” This year, the Global Outreach Committee international guest speaker is Monica L. Parker of the International Potato Center, Nairobi, Kenya.

“We’re looking outside of North America and welcoming international scientists. It is good to keep a global outlook and establish new avenues of cooperation, with Dr. Parker to present on production systems and value chains for potato in sub-Saharan Africa,” says Novy.

Another primary component of PAA is the training of grad students. “For me, the PAA annual meeting was a great place to cut my teeth on giving presentations, and that has served me well over my 24-plus years in research,” Novy adds.

Historically, says Thornton, presentations were made by established scientists, educators or industry people. Over the last 20 years, the inclusion of graduate students has increased and a significant segment of presentations are made by them.

“PAA is key to the development of the future scientific and educational community and industry from the younger people who are going to be tomorrow’s resources,” says Thornton.

He has supervised six PhD students, of which five



Rich Novy is a research geneticist with the USDA Agricultural Research Service.

PAA MISSION STATEMENT

The Potato Association of America shall collect and disseminate scientific information relating to all phases of the potato industry, including, but not limited to, teaching, research, outreach, breeding, certification, production, pests, transportation, processing, and marketing and utilization.

have become part of the industry. Such a percentage moving into the industry is the norm, and not the exception, he says. “Students leave our program and move into the potato industry, or into industries allied with the industry in a service capacity or other role. That’s a huge contribution PAA makes.”

“Everybody is there to support the graduate students and really give them assistance and help and guidance whether they’re in their program or

somebody else’s program,” says Hiller.

One of the association’s most important attributes according to Thornton, Hiller and Novy, and one which stands out for all members, is its sense of camaraderie.

“It struck me the very first meeting, and ever since, and that’s the family nature of PAA,” says Hiller. “In so many scientific organizations, scientists are worried about their own little domain — and they protect it. They’re very secretive and they don’t let much out, and they don’t let many penetrate that shell. That just does not exist within PAA among potato scientists.”

This fellowship fosters greater communication within and without the association, says Hiller. “There’s a sense of exchange in scientific presentations and discussions. You’re not protective, you’re outpouring, you’re sharing, you’re building something together and you’re helping yourself by helping somebody else and they’re helping you, and so forth. To me that’s an important aspect of what we call this family feeling to the PAA organization.”

Thornton adds, “It brings about a feeling of common interest and brotherhood among people who are professionally committed to the well-being of the potato industry, such as educators and scientists, who perceive their role in life is to help maintain a viable, economically-sound, environmentally-friendly, industry.”

According to Novy, although the industry may seem large with individuals from many different backgrounds, countries, and professional disciplines, it’s still a close-knit group.

“Even though we’re 468 members representing 25 countries, you have the opportunity to reconnect annually at the PAA annual meeting. Yes, they’re your colleagues, but in a way, it becomes more than that. It really does give one a sense of a family reunion. It’s a wonderful opportunity to build both personal and professional relationships and develop research collaborations.” ○

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2019 PAA Symposium Unites and Sustains Industry

The PAA's Marketing and Utilization section takes on trending topics and illustrates marketing is the tie that binds the potato industry in this highly-anticipated session. BY KARI BELANGER

THE SYMPOSIUM BEING held at PAA's annual meeting is an event no one will want to miss. "These are the hottest topics in the industry right now," says Tina Brandt, co-chair of the 2019 PAA Symposium and Variety Development Manager for the J.R. Simplot Company. The event, which is being hosted by PAA's Marketing and Utilization section, is also a little different this year, she adds.

"This one is unique in that it's less of an academic-focused group, but it ties us all together because researchers are ultimately concerned about the utilization of the crop," she says.

The topic is "Changes and Challenges in the Potato Marketing Sectors," which is information applicable across the entire value chain. "It all comes down to whether or not we can sell the crop, and the demand for the crop. So, it's a universally-appealing session," says Brandt.

The mix of guest speakers Brandt and the Symposium Committee have brought together for the event will be addressing important issues across all marketing sectors.

Bayer Crop Science's head of Regulatory Affairs in Canada, Seshadri Iyengar, will discuss European markets and the status of the sprout inhibitor chlorpropham (CIPC) in Europe. The CIPC situation is one the entire industry is paying attention to, says Brandt.

Iyengar will report on the status of the non-renewal of CIPC and how markets and the industry is handling the change.

For European producers, it's going to be quite a challenge, says Brandt. However, what happens there will affect North American industry stakeholders if not in a regulatory sense then in trade. "Some of our global export partners may be affected in a roundabout way," says Brandt.

Audrey Boulianne, general manager of Québec Parmentier based in Québec, Canada, will talk about innovative fresh market packaging and marketing. Boulianne will share marketing innovations she's been involved with and how some of the changes her company has made have been effective in expanding its markets, says Brandt.

"We look forward to hearing the experiences of Québec Parmentier's successful coordination of dozens of family farms and dozens of potato varieties to create a unique product which increased demand in the fresh potato market," says Brandt.

Trends in the processing sector is the topic Catherine Cantley, a food processing specialist for the Idaho-based company TechHelp and Assistant Professor at the University of Idaho's School of Food Science, will address.

Cantley has worked in both the chipping potato and French fry processing sectors, so she's got a lot of experience coming from the private sector, says Brandt, and can provide food processing and quality assurance expertise.

Another guest speaker will explore maximum residue limits. In general, the term "MRL" is tossed around the industry a great deal, says Brandt. "But what



This year's symposium topic, "Changes and Challenges in the Potato Marketing Sectors," will be interesting to a wide-ranging audience.

does that really mean?" she asks.

This is one question Alinne Oliveira, a trade policy specialist for Bryant Christie Inc., will answer when she discusses her topic "Understanding MRLs and their Impact on Global Marketing."

"Countries have decided that they're going to develop their own set of MRLs and they're moving away from the older Codex system," says Brandt. Oliveira will clarify this changing environment at the symposium.

Because presenters are coming from such diverse backgrounds, and not strictly academic research environments, Brandt believes the event will be interesting to a wide-ranging audience.

Tracy Shinnors-Carnelley, co-chair of the PAA's Local Arrangements Committee and vice-president of Research and Quality for Manitoba-based Peak of the Market, agrees. She says the event's topics will be engaging to everyone in the potato industry.

"The variety of people that come to PAA — plant breeders, pathologists, agronomists — are people who work in their individual speciality areas within the potato industry. This is of interest to all of us because when we look at potato marketing, ultimately for us to be successful in our own areas it relies on the strength of potato marketing around the world," she says.

"This is a way of getting everybody familiar with the challenges that we're not directly familiar with on a day-to-day basis because we're all connected through marketing in some way." ○

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PAA Local Arrangements Committee HITS IT OUT OF THE PARK

What's the local scene for this year's PAA Annual Meeting?
Organizing committee co-chairs give the goods.

BY KARI BELANGER

MANY POTATO INDUSTRY thought leaders will be converging in the centre of Canada this summer for the 103rd Potato Association of America (PAA) Annual Meeting. Researchers, agronomists, producers, graduate students, and plant breeders and pathologists represent some of the industry stakeholders who will attend the meeting July 28 to Aug. 1 in Winnipeg, Man.

Conference organizers are expecting up to 240 participants from Canada, the United States and Mexico, as well as from many far-flung corners of the world, such as South America, the Netherlands, Europe, China, India and Australia, to name a few, giving the conference an international flair, says Tracy Shinnors-Carnelley, co-chair of the PAA's Local Arrangements Committee and vice-president of Research and Quality for Peak of the Market.

"There has been an increasing interest from the international potato community to attend PAA. It speaks to the level of collaboration happening between North American researchers and other countries."

Local Arrangements Committee co-chair Vikram Bisht, who is also a government of Manitoba plant pathologist and agronomist for potato, vegetable and small fruit crops, is thrilled to be hosting the meeting in his home province.

"I'm very excited to have the conference here and to talk with our visitors from all over the world. Hosting the meeting in Manitoba will allow the province to showcase what it has accomplished in the potato sector," says Bisht. "Having meetings in different states and provinces provides a chance to understand the opportunities and challenges for potatoes in different regions of North America."

For many delegates, the conference provides an excellent environment for networking, learning and socializing. Not only do attendees have access to the latest information from the entire value chain, the meeting provides unparalleled networking opportunities as well as a setting to build long-term friendships.

Many delegates have been attending the annual meeting for years, which is why for some it feels more akin to a family reunion than a scientific conference.

"It's this small family of growers, researchers, agronomists, and other industry stakeholders. They go to these conferences so often that the people are almost like a family and they do many activities together. People will also bring their families because they want to meet the spouses of friends from other cities, states or countries," says Bisht.

This year the Local Arrangements Committee is particularly excited about the Industry Day scheduled for Tuesday, July 30. "I'm really pleased with the complement of papers to be presented on Industry Day. They will be of interest to a broader industry in Manitoba," says Shinnors-Carnelley.



Vikram Bisht



Tracy Shinnors-Carnelley

The sessions are aimed at management practices — for example, pesticide applications, irrigation, seed spacing, harvest timing, fumigation, and nutrient management — for industry stakeholders who are more practical-oriented.

Local producers, agronomists and consultants will find the Industry Day very useful, says Bisht. "The talks and discussions are very practical and down to earth," he says.

The itinerary for that day is particularly geared toward producers in many ways, says Shinnors-Carnelley. "It's a great opportunity for growers because it's one day,

so it's not a big time commitment and it's a great opportunity to network. They have the chance to put faces to names and maybe have a cup of coffee together. That's a great opportunity and it's right here in our backyard."

Attending Industry Day is also a good introduction to the PAA and its annual meeting. "It's a way for people who haven't participated at PAA events to come to the meeting, learn what's on the program, but also it's an opportunity to interact with that broader PAA group and become exposed to that network of North American — and beyond — research community," she says.

The Local Arrangements Committee pulled out all the stops when assembling a social agenda both on-site and around the town.

Sports enthusiasts can kick off the social events with a round of golf at the Rossmore Golf and Country Club or head to Shaw Park to cheer on the Winnipeg Goldeyes at a baseball game. Delegates can greet old friends or make new acquaintances at the President's Reception on the first evening.

Students can connect through the graduate student networking activity on the first day of the meeting, says Shinners-Carnelley. "It has become a tradition. It's a great way for graduate students — for many of which it may be their first time coming to PAA — to get introduced to that group and a great way to get started for the week ahead of them," she says.

The organizing committee put together a social activities program showcasing the best tours and sights Winnipeg has to offer for both delegates and accompanying persons. From museums and shopping, to the Assiniboine Park Zoo, there are activities to please everyone.

One of the conference highlights is an outing to the "Journey to Churchill" exhibit at the Assiniboine Park Zoo, where visitors can watch polar bears and seals swim from underwater viewing tunnels.

"The polar bear is part of Manitoba and 'Journey to Churchill' will be a fun night out for everyone. We're also holding our live auction. This has become a PAA tradition where proceeds from donated items go to the PAA endowment fund," says Shinners-Carnelley.

One evening, a shuttle service will provide transportation from the Delta Hotel to The Forks and The Exchange District where there is plenty to explore. The Forks is an historic landmark located at the junction of the Red and Assiniboine Rivers, where people have been meeting for 6,000 years — and home of the Forks Market. The Exchange District is a national historic site featuring North America's largest and best-preserved collection of heritage buildings.

Conference attendees may also tour the Canadian Malting Barley Technical Centre, an independent, not-for-profit research facility established in 2000 serving the Canadian malting barley value chain.

Because delegates bring friends and family members, the organizing committee has put together an Accompanying Persons Program. The committee has identified the best places to tour, visit, shop or relax in Winnipeg, says Bisht.

"There'll be transportation provided to take accompanying persons where they wish. We have planned shopping, sports, a visit to Assiniboine Zoo, and the Canadian Museum for Human Rights," he says.

To hold a conference like the PAA annual meeting takes a lot of manpower, work the locals were happy to take on.

"We've been very lucky to have such a committed group of people from our local potato industry. Some of those people are frequent participants at the PAA annual

meetings and they wanted to be a part of this and support the first time this association has come to Manitoba," says Shinners-Carnelley.

"We have diverse representation. There's Manitoba Agriculture and University of Manitoba involvement, and industry involvement from Peak of the Market and Keystone Potato Producers Association, and other industry partners."

Bisht was also grateful for the advice of the PAA board of directors and organizers of earlier PAA annual meetings.

Sponsorships from potato industry stakeholders across North America provided the necessary funding. In fact, more than two dozen companies and organizations sponsored the event.

For Bisht, and other delegates, the social activities, seeing long-time acquaintances and friends, and attending the banquets, are all icing on the cake at the PAA annual meeting, as nothing quite compares to the excitement of learning something new.

"When you attend these meetings, you learn what's happening on the ground in many other areas," he says. "There is very precise and direct information provided and because these researchers are showcasing their work, people from other disciplines learn, whether that's agronomy, irrigation, best management practices, weeds or new diseases. There are a lot of new and improved ideas to take in," says Bisht.

"Good attendance at the annual meetings are a testimony to the importance of PAA and how the industry stakeholders value PAA." ○

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Research **You** Need to Know About

A look at some of the practical results from the latest potato research being presented at the PAA meeting this summer. BY CAROLYN KING

THE NEARLY 100 presentations at the 2019 Potato Association of America (PAA) annual meeting in Winnipeg, Man., cover an amazing range of research areas. *Spud Smart* gave Zachary Frederick, a potato research agronomist in Manitoba and a member of the meeting's Local Arrangements Committee, the tough task of choosing the top three topics that growers should know about.

Frederick and his Manitoba colleagues Tracy Shinnars-Carnelley, co-chair of the PAA Local Arrangements Committee and Leonard Rossnagel, a retired potato agronomist, picked presentations on research areas they see as very topical, relevant and directly applicable to Canadian potato growers.

FINE-TUNING PINK ROT FUNGICIDE TIMING

Jeff Miller, a researcher with Miller Research in Idaho, will be presenting his latest study on management of pink rot (*Phytophthora erythroseptica*). This persistent soil-borne disease causes tuber breakdown and yield loss. Miller's field trial is looking at the effect of the timing interval between spraying a phosphite fungicide for pink rot suppression and applying irrigation water.

Miller provides some background information to put his study in context. "For many growers in Idaho and in other places, pink rot of potato is a pretty serious disease problem. It is controlled by a number of methods including irrigation management and crop rotation. But with some potato varieties that are really susceptible, the use of pesticides is required," he says.

"One fungicide that has been very effective is metalaxyl or mefenoxam [Ridomil]. It has been a pretty easy way to manage the disease; growers could put it on once in-furrow or perhaps twice on the foliage to control the disease." But, over time, mefenoxam-resistant pink rot has become more and more common in potato-producing regions.

"One of the next best options is phosphite-based fungicide products. However, phosphites are not as good as the old mefenoxam-based products. They are very weak as fungicides, so you have to use pretty high rates and apply them frequently."

One question around phosphite performance is whether these fungicides would work better if the potato plants were given more time to absorb the fungicide before the treated crop is irrigated or receives precipitation. For example, research by some scientists in Canada found it takes about 48 hours to get almost the full uptake of a phosphite application.

"Let's say a farmer sprays the phosphite fungicide and then turns their irrigation system on a day later. Is that irrigation going to wash off some of the fungicide before the plant can absorb it?" asks Miller.

So, with funding from the Northwest Potato Research Consortium, Miller is leading a two-year trial to answer the question: Do growers need to wait 48 hours from the time they apply a phosphite fungicide to when they irrigate?

"Our experiment was really quite simple," he says. "When it came time to make applications of the fungicide based on the growth stage of the plant, we knew



Jeff Miller will be presenting his latest study on pink rot management.

PHOTO: JEFF MILLER/MILLER RESEARCH

when the irrigation was going to go over the trial, so we spaced the fungicide applications at 48, 24, 12 and 6 hours before that irrigation. At the end of the season we measured how much pink rot developed."

At the PAA meeting, Miller will be presenting the findings from 2018, the trial's first year. These findings are good news for irrigation farmers — and for dryland farmers trying to time their phosphite applications with the weather forecast in mind.

"We had significant control of the disease if our fungicides were applied 12 hours or more before the irrigation. At six hours the results weren't as good; in fact, it looked like there was a reduction in performance. But we didn't see a difference between the 12-, the 24- and the 48-hour time intervals," he says.

"Especially here in Idaho, we have a very arid environment and growers' centre pivots are going almost non-stop at times. If growers had to wait 48 hours after spraying the fungicide before they water, that would have created quite a hardship for them," Miller explains.

"But we're saying you don't have to wait that long. If you can give it a day, please do, but you don't have to. You just need to wait 12 hours, half a day, before you turn the irrigation back on, and most growers can do that."



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Andrei Alyokhin's findings on the spread of PVY will help growers to focus their control efforts on practices that actually work. PHOTO: AARON BUZZA/UNIVERSITY OF MAINE

PVY MANAGEMENT STRATEGIES THAT WORK

At the PAA meeting, Andrei Alyokhin, a professor of Applied Entomology at the University of Maine, will be talking about his recent studies on the transmission of Potato virus Y (PVY), an aphid-borne virus that impacts potatoes worldwide.

"PVY is an economically important virus that causes significant crop losses," he says. Depending on the potato cultivar and the strain of the virus, PVY can cause such symptoms as leaf mottling, stunted plants, plant death, tuber necrosis, and reduced tuber production. In some situations, yield losses can reach 80 per cent.

Alyokhin explains that many aphid species can transmit PVY. When an aphid probes an infected plant with its beak, or stylet, to see if it wants to feed from the plant, it can pick up the virus on its stylet. The aphid carries the virus to the next one or two plants that it probes, cleaning off its stylet in the process. But the next time the aphid probes an infected plant, its stylet will pick up the virus again.

"The process of transmission takes just a few seconds, and insecticides do not kill aphid vectors quickly enough to prevent it from happening," he says.

PVY inoculum sources can include infected plant materials like infected seed potatoes, cull piles and weed hosts. Alyokhin has made an interesting discovery through his research on the role of weed hosts.

"It is commonly assumed that PVY has a broad host range; thus, infection could easily arrive in a potato field from the nearby non-crop plants. However, our field surveys and greenhouse transmission experiments indicated that the importance of non-crop plants in causing PVY epidemics in potato fields is likely

exaggerated." Good weed control within fields is always important, but this finding has implications for weed management in non-crop areas next to potato fields.

"Weeds in the family *Solanaceae* [the potato family], such as nightshades, can harbour PVY and should be eliminated. However, there is no need to get paranoid about other weeds in the vicinity of a field, such as dandelions and lamb's-quarters. Contrary to earlier reports, these are unlikely to be responsible for any significant amount of virus arriving in a field."

Alyokhin has also been taking a closer look at the many factors influencing the spread of PVY. "We constructed a computer model simulating PVY spread in a potato field and used it to investigate possible effects of PVY incidence in planted seed, transmission efficiency, vector behavior, vector abundance, and timing of peak vector activity on PVY infection of harvested tubers," he says.

"Although planting higher-quality seed resulted in fewer infected tubers at the time of harvest, high transmission efficiency still resulted in significant PVY spread even when the initial virus inoculum was low. An early-season peak in the numbers of moving aphids resulted in the highest number of infected plants at the end of the season, while mid- and late-season peaks caused relatively little virus spread."

The results from this research support the dual strategy of using high-quality certified seed and then spraying horticultural mineral oils on the crop on a regular basis; these oils reduce the transmission efficiency of aphid vectors. The results also highlight the importance of PVY management efforts early in the growing season.

"Growers still often rely on spraying insecticides in an attempt to prevent PVY

spread, even though such an approach is not effective. Our findings will help them to focus their control efforts on things that actually work.”

PEST ALERTS TO HELP FIGHT ZEBRA CHIP

In her presentation, Carrie Wohleb, an associate professor and a potato, vegetable and seed crops specialist with Washington State University (WSU) Extension, will be sharing the results from a monitoring network in Washington State that tracks potato psyllids (*Bactericera cockerelli*). These little flying insects are the vector for *Candidatus Liberibacter solanacearum*, the bacterium that causes zebra chip disease.

Zebra chip was first documented in Mexico in 1994 and has been spreading ever since; it recently touched Canada. This disease can result in major yield losses, and the tuber symptoms include brown flecks that turn into dark blotches and streaks when the potatoes are fried, making the tubers unmarketable.

“In 2011, we had our first outbreaks of zebra chip disease in the Columbia Basin of Washington and the Pacific Northwest — Washington, Idaho and Oregon,” says Wohleb.

“In Washington, a couple of potato fields were pretty much destroyed. That’s a huge loss after you’ve put everything into the crop only to lose it all at the very end. And we were also finding symptomatic tubers here and there in other fields.”

The monitoring program was established in 2012 to help Washington researchers and growers figure out how to tackle this potentially devastating disease.

The program tracks potato psyllid populations across the Columbia Basin using a network of yellow sticky cards. It also tests all of the collected psyllids to see if they are carrying the bacterium. And it includes some leaf sampling to see if the bacterium has been transferred to plants. The program is funded by the Washington State Potato Commission.

“The findings from our psyllid monitoring program are shared every Friday in our e-newsletter, called *WSU Potato Pest Alert*,” says Wohleb. “The potato growers here are very interested in our results every week.”

The newsletter’s weekly psyllid distribution maps provide an early warning system; if growers are in an area with high psyllid numbers, they can step up their own on-farm monitoring efforts or apply insecticides if needed (email cwohleb@wsu.edu to subscribe to the newsletter).

One of the intriguing findings that Wohleb will be discussing in her PAA presentation is the huge fluctuation in the size of the Columbia Basin potato psyllid population from year to year. She adds, “We see some zebra chip every year, but we haven’t had any major outbreaks since 2011. I’ll probably talk about some of the reasons why we think that is.”

The ongoing monitoring effort is helping Wohleb and her research group put the weekly data into a firmer context, so they can more accurately say what a small, moderate, or large psyllid population looks like, and better understand the threat of different *Liberibacter* infection rates in the psyllids. Currently, only about 0.14 per cent of the psyllids in the Columbia Basin have been infected with the bacterium. In some other regions, psyllid infection rates have sometimes been much, much higher, and those higher rates have been linked to higher incidences of zebra chip in potato crops.

Wohleb says, “In the future, we hope to be able to predict exactly where and when zebra chip is going to occur in the Columbia Basin so growers can target the psyllids using an intensive management program when the psyllids are likely to cause problems, and can save their money and not waste applications when the risk is very low.”

Canadian monitoring has found small numbers of potato psyllids in western Canada, mainly in Alberta. And in 2017 in Alberta, a handful of infected psyllids and a single example of infected potato tissue were found. Monitoring for potato psyllids and zebra chip is continuing in Alberta. ○



Carrie Wohleb leads a monitoring program that tracks potato psyllids, which can transmit zebra chip disease. PHOTO: WASHINGTON STATE UNIVERSITY

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PAA Honours Dedicated Scientists

Each year at the annual meeting of the Potato Association of America, the organization recognizes individuals who have made outstanding contributions to the industry. This year, four potato scientists have been chosen for the honour.

BY KARI BELANGER

FOUR MEMBERS OF the Potato Association of America (PAA) will be recognized for their outstanding contributions to the potato industry and the organization this year at the 103rd Annual Meeting. Kathleen Haynes, John Nordgaard, Peter VanderZaag and Nora Olsen will be presented with the Honorary Life Membership Award, which is the highest honour conferred on an individual by the PAA.

Recently, each 2019 Honorary Life Member Inductee spent some time with *Spud Smart's* editor to talk about their lives, research, inspiration and lessons learned over the course of their careers. The following are excerpts from the full stories featured on spudsmart.com.

WE HAVE COMMON DNA

Peter VanderZaag has been on a vigorous campaign to alleviate poverty and hunger through potato science and production almost his entire life. His work improving potato production in Central Africa, Southeastern Asia, and China has had far-reaching effects.

The researcher was heavily influenced by his heritage — generations of VanderZaags in the Netherlands have been potato producers — and most notably his Uncle Date, a distinguished potato scientist.

To this day, varieties VanderZaag introduced to Rwanda around 1980, as a scientist for the International Potato Center (CIP), make up half of the country's potato production. As CIP's regional leader for a potato program based in Rwanda and including, Burundi, Uganda and the Democratic Republic of the Congo (then Zaire), he dramatically increased potato production in those countries.

Before his work in Central Africa, VanderZaag spent two years in Bangladesh, with the Mennonite Central Committee (MCC), aiding poverty alleviation by helping local farmers improve potato production.

From 1982 through 1990, VanderZaag, with his wife, Carla, worked for CIP as a regional director for



In countries like the Philippines and Vietnam, Peter VanderZaag helped introduce new varieties, improve crop management and production practices, and guided many graduate students in their thesis research from many countries.

Southeast Asia. However, he feels it is his work in Southwest China that has helped feed and raise out of poverty families in the hundreds of thousands.

In one example, tens of thousands of families are helped by VanderZaag's efforts. "Twenty thousand families in a new area are now growing more than 20,000 hectares of potatoes and are getting out of poverty. To see just one example of 20,000 families affected by the work I was part of — there's no better heart-warming story than that."

The variety Cooperation 88, developed by a collaboration between CIP and Yunnan Normal University in Kunming, China, is one of CIP's most successful varieties. "It has had a conservative estimated GDP impact of more than three billion dollars. It's awesome to see. It revolutionized the potato itself," he says.

For this accomplishment, VanderZaag was honoured with China's prestigious National Friendship Award in 2014. It wasn't the first time he'd been acknowledged with a distinguished award for contributions to a foreign country.

At a national seed potato farm in Rwanda, the country's president at that time, paid VanderZaag a visit to thank the scientist for all he had done for the country and to bestow upon him the Honorary Citizenship Award for Rwanda. For his work on poverty alleviation through crop diversification in Bangladesh, VanderZaag, along with his MCC colleagues, were awarded the Gold Medal.

Presently, VanderZaag is working on a project in the mountainous regions of South China to help lift impoverished tribal and mountain peoples out of poverty through potato production.

When in Canada, VanderZaag grows about 1,250 acres of potatoes in Alliston, Ont., with his wife, daughter and son-in-law at Sunrise Potato Storage Ltd. To relax, he enjoys spending time with his four young grandchildren and the rest of his family. According to VanderZaag, relationships are what life is all about.

"The most important thing in my life is relationships. Through relationships you can do anything. I can say that my work in Africa and Asia continues to this day because of relationships. That's my life lesson and what I try to tell young people as well."

As with all other areas of his life, this researcher, farmer and feeder of hundreds of thousands of people has established long-time relationships with his PAA colleagues.

"It's a big family. We have common DNA. That's why PAA is so unique. . . . To me, the life of the PAA revolves around older people and young people working together," he says.

CHAMPION OF THE INDUSTRY

Nora Olsen has a list. It's a bucket list, of sorts, she has kept for the past 10 years of all the potato research she'd like to carry out. It's no wonder that list is dwindling after the University of Idaho professor and extension potato specialist's tireless efforts for the sector.

Olsen champions the potato industry and its stakeholders, especially growers, because she loves her work and feels honoured to be part of it.

“I feel so fortunate in my life and my career and being involved with the potato industry. Having the mentors and colleagues in the industry and the support I’ve had all these years — it’s remarkable. I’m very proud of the industry and I appreciate every day I get to be part of it.”

Mentors such as Larry Hiller, Robert Thornton, Phil Nolte and Loretta Mikitzel shared their passion for potato science and production with Olsen early in her career.

“I was indoctrinated to the importance of the potato: the scientific aspects, the application and production, and just how important it is on a global level,” she says.

To date, Olsen has carried out more than 400 extension and scientific presentations and authored or co-authored more than 320 scientific and extension deliverables.

“If you want to feed the world, this is such a nutritious part of our diet, and you can feel really good about that. I love its versatility, it’s fascinating biologically, and it’s so complex in terms of production. Once it’s in your blood, it’s hard to get it out.”

Olsen was hired by the University of Idaho in 1998 — after finishing her PhD in horticulture at Washington State University — and she’s been a potato specialist there for almost 21 years. She has been a member of the PAA since she was in graduate school and has not missed a meeting in 23 years.

Recently, at an annual meeting she had an aha moment when she realized her role in the industry and the association had come full circle. “I’m at the point where I get to nurture, mentor and encourage people in the industry,” she says.

During the PAA annual meeting this summer, Olsen will be presented with the Honorary Life Membership Award for her contributions to the industry and the organization. The award came as a big surprise, she says, adding she’s honoured to be a part of, and recognized by, the association.

It’s a small group nationally and internationally working on potato storage research. Olsen has enjoyed specializing in this area, which has included alternatives to sprout inhibitors, organics, and disease control options. She says on the surface, storage may appear straightforward, however, it’s anything but. This complexity is the crop’s draw for the potato scientist.



For almost 20 years, Nora Olsen has held many offices as a member of PAA, including president from 2013 to 2014. She says it has been a pleasure serving the association and keeping the organization moving in the direction of its mission.

“You have air, humidity, temperature control and sprout inhibitors, but really it’s so complex. There are blanket recommendations, but when you get into the nitty-gritty, it’s such a case-by-case situation.”

Olsen isn’t worried about finding tasks to add to her 10-year list. At the moment, she’s working on quality in general, including processing quality, French fry colour and disease management. She’s also making a huge shift in focus to potato quality from a bruise and fresh market aspect.

“We’re looking at shatter bruise, blackspot bruise and pressure bruise and anything that would be detrimental to quality for a fresh consumer.”

She’s also looking at research involving potatoes infected with certain viruses, such as Potato virus Y, tobacco rattle virus and potato mop-top virus, and how those diseases change product quality over time in storage. Additionally, Olsen would like to focus more on the relationship between agronomic practices and conditions in the field and how tubers respond in storage.

Potato production also plays a large role in her leisure time. The eminent potato scientist loves to garden. This year she’s planted seven different potato varieties her family can harvest early. She also uses her garden as an outdoor classroom.

“It was nice for me to teach my kids from a young age about how to plant potatoes, how they grow,

and that they need to smush all the Colorado potato beetles for me. It was important for me to integrate them into the potato world and gardening.”

It seems Olsen has done her job well passing on the potato’s value and versatility to the next generation. In June, her daughter participated in the National Speech and Debate Tournament in Dallas, Texas. Her topic: “The Eighth Wonder of the World — The Potato.”

“I’m pretty proud,” says Olsen.

THE HONOUR IS OURS

After spending more than three decades with the USDA Agricultural Research Service’s Genetic Improvement of Fruits and Vegetables Laboratory as a research plant geneticist developing improved potato varieties, Kathleen Haynes says a significant highlight of her career has been bringing researchers together to work on projects for the benefit of the potato industry.

This year, recently-retired Haynes is being acknowledged by the PAA with its highest award, Honorary Life Membership, for her dedication and contribution to the industry. In turn, she’s recognizing her collaborators as instrumental to her long and successful career.

“I wouldn’t have been honoured if it hadn’t been for the members of this research community I’ve been associated with over all these years. The honour is ours, not mine,” she says.

Throughout her career, Haynes believed it was important to develop strong connections to all industry sectors. She learned early on “you can’t do it alone.”

“I really value the relationships I’ve been able to establish with scientists across the country. And establishing relationships with other potato breeders is nice, but I’ve met a whole lot of other people in other fields involved with potatoes — pathologists, entomologists, physiologists, and those in production and management.”

Another realm Haynes found particularly rewarding was mentoring graduate students and visiting scientists. For a decade she was a member of the PAA Graduate Student Awards Committee, also becoming the group’s chair. The work quality the grad students offered always took her by surprise, she says.

“When I got involved with the Graduate Student Committee, the students kept setting the bar so high that the rest of us professionals were struggling to keep up with them.”

Haynes retired in January this year, and she’s never been busier, she says. “Now, I don’t know how



Kathleen Haynes is most proud of the working groups she and other PAA members assembled to address problems in the potato industry.



John Nordgaard credits the golden rule as one of the keys to managing people. It is very important you treat everyone with respect and to always make your expectations clear, he says.

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I ever had time to work. For me, it's like being a kid when summer vacation has just started." Haynes is hiking, biking and walking as well as pursuing creative activities such as quilting, cross-stitch and reading. She is also learning to play the cello after neck surgery prevented her from continuing to play the violin.

However, her biggest adventure — and challenge — is about to begin. Eighteen months ago, Haynes began the process of becoming an adoptive parent to an older teenager. She's hoping everything will be in place for the beginning of the fall term at high school.

"I had always hoped to do this, but my career required me to be on the road three months of every year and I kept telling myself, 'now is not the time.' [In January of 2018] I thought if I don't do it now, I'm never going to do it ... So, I'm doing it," says Haynes. "Any year, on average, 23,000 kids age out of foster care with no parent in their lives, which is just horrendous."

"My goal is to help them come to believe that they can do anything they want to do with their lives."

WORTH THEIR WEIGHT IN GOLD

Since John Nordgaard has been with Black Gold Farms, the company's size has quadrupled. Employees have increased from around 30 in 1997 to 185 full-time staff today. As director of operations then, and executive vice-president of operations now, Nordgaard has participated in much of that growth. Although, he'd be the last person to say so.

At Black Gold Farms, Nordgaard oversees operations for all farms across multiple states, he has also managed all personnel and has directed agronomic planning and practices, including irrigation and general production management, for both potatoes and sweet potatoes.

Over the past 22 years, he's shown exceptional ability managing research projects and facing down many newly-emerging disease threats and overcoming irrigation and weed challenges, furthering Black Gold Farms' goals and contributing



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to the body of scientific knowledge on issues affecting potato production.

“We faced some very serious disease issues with zebra chip disease, *Dickeya* bacterial issues, late blight, and a whole host of pathogens, weeds, and irrigation issues, and for the most part, we’ve been able to learn how to manage it. We’ve never conquered it all, but we’ve learned how to manage and work with it,” says Nordgaard.

At Black Gold Farms, Nordgaard has been involved with research projects and committees, test plots and sampling, and research collaborations with other PAA members. “We’ve shared results and pushed the academic field, and those who hold the purse strings to fund projects, so that we could learn and move forward,” he says.

“My job at Black Gold Farms is to take strong research and analyze that work done by other people and put it to work on our farm. That is an area where PAA has been exceptionally helpful to me and to Black Gold Farms. That information and those friendships I mentioned are worth their weight in gold.”

These days, while wearing his pathologist hat, Nordgaard is working on the

Dickeya bacteria complex and he’s also “putting considerable efforts in the field of powdery scab,” he says. He’s also focusing on the business’ seed side by concentrating on growing smaller seed for single drop use and looking at ways to improve seed cutting and physiologic age.

“We’re diversifying our seed production in a number of ways,” he says. He’s also going to delve into the area of soil fertility a bit harder, he adds.

Sometimes, Nordgaard has time to dream about retiring — and gardening, fishing, woodworking, and hunting, perhaps, even, spending some time at the cabin on the lake — but do potato researchers really ever retire?

“I’ll be involved in some form or fashion. I’m on four different Specialty Crop Research Initiative committees, I’m on the advisory board for our Northern Plains Potato Growers Association and I’ll continue to do some research projects that support the industry,” he says. “PAA is a tremendous organization and I look forward to many more years working with them.” ◊

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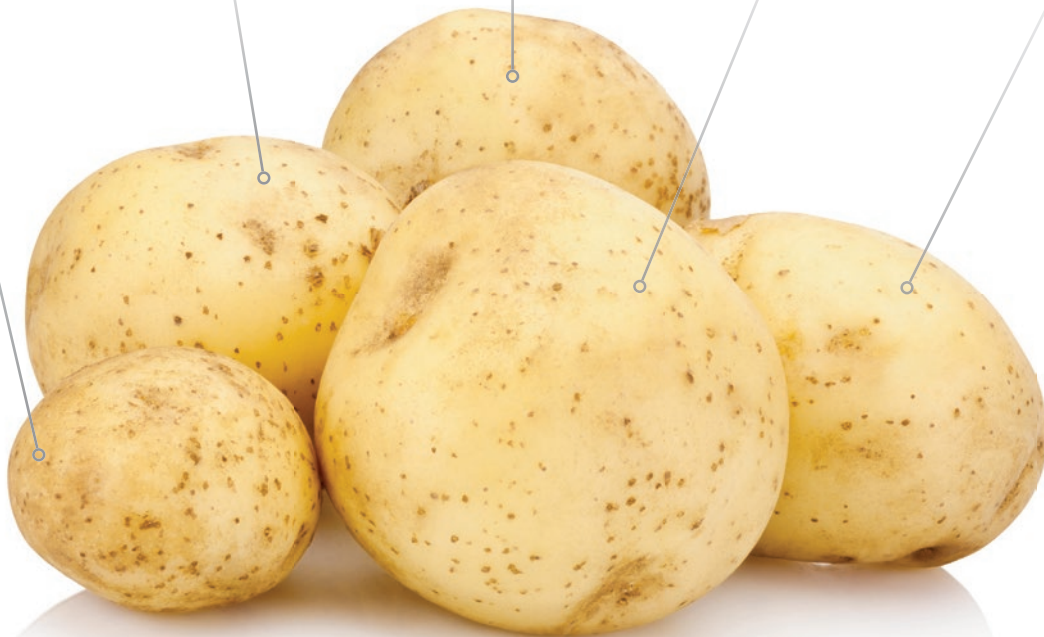
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Gary Naslund farms with CSS Farms in Nebraska. He was among the very first farmers to adopt sonar-based technologies that automatically control potato harvester boom height and digger depth. Today, he runs a fleet of nine harvesters equipped with both technologies.

Naslund grows round whites for Frito-Lay. Like every farmer, his priority is to capture quality incentives and minimize damage disincentives at processing. A handful of years ago, he invested in his first automatic boom height control: an investment he says has made a “huge” impact to his potatoes’ quality.

“One of the biggest problems we have on our farm

is that we start almost completely fresh for labour every year, which means we have a totally inexperienced crew operating our machines. A really good harvester operator can run a boom without automatic technology. Having it on board if your operator is good just makes it easier for him, though some of my best guys choose not to even use it. But, where automatic boom height control really shines is if you’ve got someone inexperienced running the harvester. It is really, really effective at minimizing bruise.”

On his variable geography, automatic depth control offers at least as much benefit, both because it minimizes tuber damage and because it controls the amount of soil pushing through the machine, optimizing speed.

“We farm some really rough ground. That digger control has been a godsend on that land. When you’re going through valleys and over hills, even the most experienced operator will tell you it’s totally a guess as to how deep you are. But with depth control, you can have confidence knowing you’re getting exactly the depth you want.”

Auto depth control is also a benefit in variable soil where the machine would otherwise dig deeper in sandy areas and ride high on firmer ground.

Unlike some technologies, sonar-based automatic boom height and digger depth control is plug and play simple, he says.

“Figuring out the first one took a bit of time, but installation of Greentronics’ system is easy and the learning curve of the software is easy. Once you have the setting in and the sensors in place, it does its own thing. I think I’ve replaced one sensor in five years. We find the only real maintenance we’ve had to do is because wires get pinched or cut because of operator error.”

The technology automatically self-calibrates and, though operators can adjust certain controls based on preference, little operator involvement is required.

Who would Naslund recommend these technologies to?

“Every farmer needs to make their own decisions about what to invest in and how to calculate return on investment. For us, these were easy decisions.”



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In case we needed proof that nature calls the shots, just look to recent weather virtually across our country. Through most of Alberta last summer, heat and extreme dryness frustrated farmers and limited yields of all crops, including dryland potatoes.

P.E.I. growers had it even worse: their 2018 season was thwarted first by unusually hot and dry growing conditions, then by harvest-delaying extreme moisture, and then — just as machines could finally get into fields — by early frost.

And across Ontario and Eastern Canada this spring, crops are significantly delayed due to excessive moisture. Severe weather of all kinds is becoming more common of late. While farmers will always be subject to nature’s whims, there are a few options to help minimize the impact of challenging growing conditions.

Some dryland farms are proactively managing drought stress by preceding their potato crop with a year of moisture-preserving cover-cropped summer fallow. Admittedly, it is challenging to leave any field without a harvestable crop. However, we have consistently found a potato crop grown following fallow boasts an average yield benefit of two to three tonnes per acre compared to neighbouring potato fields grown following a cereal rotation.

In addition, the quality of the potatoes grown post-fallow tends to be better, since higher yields mean less rolling and jostling of tubers at harvest. Given potatoes’ high value, these yield and quality benefits make up for the loss of income the season prior.

As unusual weather appears increasingly usual, we also suggest that farmers manage their crops with less than ideal conditions in mind. Diversifying

varieties can help mitigate the unexpected.

We continue to work with processors to test and trial new varieties. We’re certainly not alone in the effort. Across the industry, universities, private breeders and industry stakeholders are making noticeable strides forward in variety breeding. Already, fresh-pack farmers have some good options for more stress-tolerant varieties and work is being done to improve chipping and processing varieties as well.

Drought and heat tolerance are key priorities of breeding programs, as are early maturation and improved storability. Improved, sustainable varieties provide increased flexibility. We are happy to see that growers and processors are more willing to consider the newer stress-tolerant varieties.



POTATO STORAGE

Want Higher Contract Prices? Here's How to Get Them

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▶ One thing is certain: there's no shortage of demand for quality Canadian potatoes.

With processors in Western Canada and the U.S. Pacific Northwest expanding and building as we speak, potato inventory demands are on a sharp rise. In fact, I estimate we'll need many thousands more acres of potato production to keep processors content as they continue to expand.

And growth in the industry isn't just in the form of new builds: current facilities are ramping up production in every way possible. In the "old days" — even just 10 or 20 years ago — processors processed on a somewhat seasonal schedule: running really heavy only post-harvest. Now, virtually all processors are doubling shifts all year long.

Despite the huge jump in processing capacity currently underway, processors can't keep up with growing demand: consumers are hungry and getting

ever hungrier for quality processed products. This coming summer will likely be hard evidence of exactly that: I expect by July or August we'll see shorter French fries and discoloration at fast food chains.

Some analysts even predict shortages of available processed product. Admittedly, last year's harvest conditions were really challenging in a lot of key potato production areas. Still, processors' difficulty maintaining a consistent flow of top-quality product shows just how little wiggle room currently exists in the processed potato arena.

Given the pull from processors, there aren't many potato producers who aren't at least thinking about expansion. Farmers are stepping up production by planting more acres and squeezing row spacing from 36 inches to 30. Some think we'll see significantly more dryland farming in the future. Farmers are also doing all they can to increase and improve storage

capacity and storage know-how in order to manage their inventory longer on-farm.

When I started in this business a decade ago, you were doing well if you could store into the end of May or June. Over the past 10 years, we've added virtually two months of storage across the industry. Some of the largest-producing growers, in fact, are literally shipping their potatoes the week before they harvest the next season's crop.

Producers who can successfully hold quality potatoes the longest can routinely achieve higher contract prices than those who are squeezed for storage space or who don't have the storage technology to maintain quality over the long term. I expect the price premium for long-term on-farm storage to only increase as consumer demand keeps growing. ○



POTATO EQUIPMENT

So, You Think You're Up On Today's Harvest Technology?

MICHAEL NILSON Lockwood Business Unit Manager and Chief Engineer • Lockwood Manufacturing • lockwoodmfg.com

▶ If you've been in the potato business for any time at all, you probably have an excellent understanding of your own harvesting equipment. However, because growers are often only familiar with what they themselves use, you may not realize how many money- and effort-saving options now exist in harvesting technology.

Today's spade blades come in multiple options (clod, semi-clod, combo, etc.). It goes without saying that the right choice depends on harvest conditions; still, I'm often surprised by how many growers don't employ the best blade for their specific field and conditions.

Harvest conditions also influence the type of cleaning technology required prior to storage/shipping. Harvesting in light, free-flowing soils is inherently easier than harvesting in heavy, clod-prone or rocky soils. In sandy, rock-free soils, some growers can get away with direct loading without prior dirt and debris management. In all other soils, however, cleaning is a vital priority handled by the multiple turns and controlled drops aboard conventional and air harvesters.

Shakers, traditionally only at the primaries but now optionally available at the secondaries, remove the bulk of loose and clumped dirt via opening and closing chains over rollers. Some manufacturers, Lockwood included, now offer tables in the secondaries with rubber-covered or steel rollers that can be spaced according to conditions. These rollers break stubborn clods and heavy dirt without bruising the tubers.

Following the shaker tables, most harvesters today offer high-velocity air. Initially, blowers appeared on harvesters to manage the debris left when vines were chopped prior to harvest. Today, an airstream of either negative (vacuum-pressure) or positive (blowing) air carries the tubers while heavier rocks drop out below.

Harvesters without full-width cleaning tables at the secondaries typically have side-elevator cleaning tables. It's worth doing some homework on the tables available today, since they now come in almost a dozen different sizes and functions. Look, too, at the new kinds of enhanced rubber, C-flex and pillow-style protection available for most moving parts, designed

to mitigate tuber nicking, skinning and bruising.

I estimate about 50 per cent of growers — generally only those in very sandy conditions — currently windrow ahead of their harvesters. Windrowing allows the digging of more rows in less time: some growers run 6-row windrowers on either side of a 4-row harvester, digging a total of 16 rows in a single pass.

The speed gain of windrowing is offset, however, by the need for additional tractors and operators to run the extra machines. And, because the crop is harvested much faster, growers who windrow often require more trucks to transport the crop out of the field. The key to success with windrowing is to balance the quantity of product entering each side of a harvester. Unbalanced loading translates to the machine over-cleaning and ultimately damaging potatoes on the more lightly loaded side.

The moments surrounding harvest are vital to both tuber quality and cleanliness. Staying up to date on improving technology and choosing the right equipment for your unique conditions is key to maximizing the value of your crop. ○

Stress Factors and Management Practices for Sugar End Disorder and Stem-End Chip Defect

BY KARI BELANGER



MIKE THORNTON

Professor of Plant Science at the University of Idaho

SUGAR ENDS AND stem-end chip defect are tuber disorders affecting product quality of processing and chipping potatoes, respectively. The environmental stresses causing the disorders occur during the growing season, but tubers appear asymptomatic until harvest or later in storage. Although there are many similarities between the two disorders, there are also some key differences.

To understand the factors causing sugar ends and stem-end chip defect as well as management practices to reduce the development risk of these disorders, *Spud Smart* sought input from industry experts Mike Thornton, a professor of plant science at the University of Idaho, and Paul Bethke, a scientist with the USDA Agricultural Research Service and an associate professor at the University of Wisconsin.



PAUL BETHKE

Scientist with the USDA Agricultural Research Service and Associate Professor at the University of Wisconsin

SUGAR END DEVELOPMENT

Sugar end disorder is caused by the accumulation of high levels of reducing sugars (glucose and fructose) at one end of the tuber, usually the basal (stem) end, but can also develop in the apical (bud) end, in response to stress.

This physiological disorder seriously affects the product quality of processing potatoes. For example, upon frying, the tuber tissue at one end of a French fry — the end with low starch and high reducing sugars — turns brown or black.

For processing potato growers, a worst-case scenario is rejection of the crop by the processor. Processors also experience losses due to product trimming and quality downgrades.

The stresses causing sugar ends, also known as dark ends, jelly ends, translucent ends or glassy

ends, usually occur early in the growing season during tuber initiation and early tuber bulking. Potatoes appear asymptomatic until exposed to colder temperatures — 10 C or cooler — in the field or in storage, says Thornton.

Normally, a potato plant makes sugars in the leaves via photosynthesis, which is translocated downward to developing tubers. Under normal growing conditions, most of the sucrose is converted into starch in the tuber, however, under stressful conditions starch production is not favoured and carbohydrates (starch and sugars) remain in the form of sucrose.

“When there is a stressful situation, particularly high soil temperatures, the potato plant will struggle with that last step to convert those sugars to starch in the tuber,” Thornton says. “You can get an accumulation of sugars in one end, usually in the tuber’s stem end, and you don’t see it unless it’s really severe visually when you cut the potato open.”

High soil temperatures during early tuber development causes sugar ends. “Basically, soil temperatures in the mid-70s [around 23 C and higher] when tubers are developing is where the potato starts to struggle to form starch,” says Thornton.

High temperatures alone can cause sugar ends; however, inadequate soil moisture can exacerbate the disorder.

The tuber’s membranes are damaged by the environmental stress and they lose the ability to compartmentalize the various biochemical constituents, explains Thornton. This damage allows reactions to occur that produce reducing sugars.

“Potatoes don’t lie and will show when they are stressed. If the sugar end symptom is expressed

SUPPORTED BY:



at the tuber's stem end that indicates the stress happened early in the growing season," he says.

Conditions favourable for sugar end development include drought conditions, the initiation of hot weather coinciding with tuber initiation and early tuber bulking and continued warm day and night temperatures for many weeks, says Thornton.

The end of the potato with the higher sugars will fry darker resulting in a gradient from a light golden colour to dark brown. The industry defines sugar ends as French fries with a predominant colour of No. 3 or darker based on the Munsell USDA Frozen French Fry Standard.

Factors that affect tuber development timing and plant canopy growth with respect to heat or water stress onset can affect the incidence of sugar end disorder, says Thornton. Planting date, field location, crop rotation, soil type, fertility, soil compaction, soil moisture, irrigation and variety all play a role in the development and incidence of sugar end disorder.

PLANTING DATE

Planting date can be altered to lower the risk of sugar end development in situations where high temperatures usually coincide with the beginning of tuber development.

"Any time in the development of a tuber up to the size of a hen's egg is when those tubers are most susceptible to sugar end development if there is high temperature stress," says Thornton.

"If you're in a region where temperatures tend to do that, say, in mid-June, if you can get the plants up and established so that the canopy or vine development is shading the soil, you've got the benefit of those cooler soil temperatures to help reduce sugar end development."

However, if growers plant too early and a poor stand develops due to seed decay, creating gaps in the canopy, soil temperatures may be high in those areas of the field.

"In that case, early planting could actually hurt you," says Thornton. "You don't want to plant so early that you have a poor stand. You want to plant early



enough, in the proper window, so you get good plant development for when the hot temperatures come."

CROP ROTATION, SOIL COMPACTION AND FERTILITY MANAGEMENT

Decreasing the incidence of sugar ends really comes down to following the practices growers know are good for potato growth, Thornton says. For example, planting potatoes following wheat, or other cereal crop, rather than a low-residue crop (i.e. sugar beets), which won't return residue to the soil and may require heavy machinery that causes soil compaction.

"You'd expect the choice to follow wheat, or other cereal crop, would give you the best shot at avoiding sugar ends because that's the best conditions for water infiltration and good plant development," says Thornton.

Soil compaction affects how well water infiltrates the soil and how much reaches the area where roots are developing. Soil compaction can also restrict the

extent of root development creating a smaller zone from which the plant can pull water.

"Situations develop where the plant is basically lacking water even though the soil is moist in a general sense — you just don't have the root system to pull moisture out of the field," says Thornton.

Soil type also plays a role in a crop's susceptibility to sugar end development. In general, a medium-textured soil, such as silt loam or sandy loam, tends to have less sugar end development than sandy soils, which warm up quicker and can be warmer during the growing season. However, good plant development, shading, and irrigation practices can offset higher soil temperatures due to soil type, adds Thornton.

Crop rotation is also important because diseases such as *Verticillium* wilt and *Rhizoctonia*, which affect the root system, can contribute to sugar end development by stressing the plant, limiting the rooting area and the plant's ability to extract moisture and nutrients. These diseases affect the root

system during a key period when the plant is growing and requires lots of nutrients and water, which also coincides with hot temperatures.

Fertility management can also play a role in decreasing sugar end incidence because nutrient availability helps drive plant development, which in turn affects soil shade and soil temperature.

“You need adequate nutrients, but you can also have too much. You can get into a situation where there is an imbalance between the growth of the leaves, which are demanding water, and the growth of the roots, which supply the water,” says Thornton.

Nitrogen is such a case as it helps leaf and vine development but does little for root development. “You can have a really big plant that’s demanding a lot of water, but not a larger root system to supply that demand,” he says. Thus, the crop is water-stressed even though there appears to be adequate soil moisture.

IRRIGATION MANAGEMENT

Early tuber development is a critical time for irrigation management. Vines and tubers are growing fast during this stage. When temperatures are increasing, growers can fall behind on soil moisture management and irrigation scheduling.

During this period of rapid plant growth, the tuber is at its most susceptible to sugar end development. Thornton recommends growers keep a close eye on the crop and soil moisture management. Light, frequent, sprinkler irrigation applications during hot periods can have a cooling effect on the soil, as long as growers don’t get behind on the overall soil moisture availability.

“If you’re irrigating so frequently that you’re losing a lot of the water you’re applying to evaporation, and you’re not recharging the full soil profile, then those light, frequent, irrigation applications are not going to help you — and they may hurt you,” says Thornton.

THE ROLE OF VARIETY

Variety also plays an important role in sugar end development. Both Russet Burbank and Ranger Russet are susceptible to the disorder, says Thornton. “Russet Burbank is the poster child for this disorder. It requires very uniform management, particularly on the nutrient and water availability side. Burbank is a variety you can’t afford to make management mistakes with if you have a hot season,” he says.

Many of the newer russet varieties, such as Clearwater Russet which is gaining rapid adoption in the Western United States, with resistance to sugar development in storage also tend not to develop



Sugar end disorder of potato.
PHOTO: MIKE THORNTON

sugars when stressed in the field, says Thornton.

Other new varieties that tend to be low sugar-developing are also resistant to sugar ends. The varieties that don’t go off-shape when stressed (by developing knobs or dumbbell shapes), also tend to have a lower incidence of sugar ends.

“There’s an association between tuber shape and this physiological disorder that’s caused by high sugar accumulation,” says Thornton.

PLANT MATURITY

Another factor affecting sugar end development recently identified by researchers is plant maturity. When a potato crop begins to naturally decline and senesce, and the soil becomes heated by the sun late in the season, potatoes can become over-mature if they sit under dead vines for a long time.

“That will tend to aggravate sugar end development,” says Thornton. “Once again, keeping a good, healthy, canopy up until vine kill, and not allowing the crop to die and the tubers to sit for a long period of time under dead vines is another key factor for avoiding sugar ends.”

According to Thornton, another important point about the development of sugar ends is the effect of stress on the tubers is cumulative, meaning a little stress on the crop may cause only a slight incidence of the disorder whereas a lot of stress increases the disorder’s incidence. Also, a long period of stress is going to cause more damage than a shorter one. In addition, the higher the soil temperature, the less it

cools at night and the longer that period lasts, the greater the risk of sugar ends.

FOCUS ON LIMITING DECAY

Once tubers develop sugar ends, the disorder is not reversible — those tubers won’t recover. Storing potatoes at warmer temperatures early in the storage season will not convert sugar back to starch or release sugars through respiration. Additionally, holding the crop at a warmer temperature will not decrease the level of sugar ends in the stored crop, says Thornton.

Rather, growers should focus on limiting decay due to jelly end rot in storage and preserving an acceptable colour for the potatoes not affected by sugar ends.

“It’s just a matter of good management practices. Make sure you have an adequate wound healing period, holding those potatoes at the recommended temperature of 50 to 55 F (10 to 13 C) for wound healing and ramping them down slowly by half a degree Fahrenheit or less per day to the holding temperature,” says Thornton.

“Don’t go down below the holding temperature for the market that crop is intended for. It’s really critical not to expose processing potatoes to cold temperatures because that will aggravate sugars overall, but even more in a stressed crop.”

Growers should also monitor the crop closely because potatoes with jelly end rot are susceptible to pathogen infection through the damaged tissues.

STEM-END CHIP DEFECT IN CHIPPING POTATOES

There are many similarities between sugar end disorder and stem-end chip defect (SECD), says Bethke. This defect shows up on the basal (stem) end of the tuber and is characterized by post-fry discoloration.

While sugar end disorder is graded by colour, SECD is graded by severity. In the mildest cases, SECD causes discoloration tracing the vasculature at the potato's stem end. As the defect severity worsens, the line of discoloration broadens out preferentially toward the periphery of the tuber, eventually moving inside the vasculature, but still forming the shape of an arc, smile or mustache, depending on how the tuber slice is cut and the vasculature is laid out, says Bethke.

Much like sugar end disorder, the presence of SECD is not apparent until harvest or later. "Potato chip growers routinely do some test digs prior to harvest," says Bethke. "They fry up some slices and everything looks beautiful. The day of harvest things still might look okay, or there may be some little defects showing up, but it may be up to a month after harvest when a grower discovers they've got a bin full of potatoes that really aren't looking that good."

Generally, the defect severity increases for the first month or two after harvest, regardless of variety. However, unlike sugar end disorder, with some varieties the defect severity will slowly start to improve.

"If the defects weren't too bad you can sometimes wait them out. This is something you don't really see with sugar end disorder," says Bethke. However, if the defects are severe at harvest or shortly after harvest, Bethke warns those potatoes may not recover.

WARM NIGHTTIME TEMPERATURES

Bethke started working on SECD about 12 years ago when the disorder became a large problem for Upper Midwest growers, in particular. At that time, SECD was causing processors to reject lots and growers were having difficult conversations with their customers.

Back then, there were no clear answers to what caused the defect, what varieties were susceptible or tolerant, or what could be done in terms of management. What Bethke has learned over the past decade or so is the disorder has many causes.

"It's not just one thing you can point to and say if that happens then you're going to have this problem," he says. However, researchers have identified the most important factor triggering the defect: warm temperatures, particularly at night.

"The field data we've seen as well as some

experimental work we've done suggests it's actually warm temperatures at night more than during the day that contribute to stem-end chip defect formation," says Bethke.

"This is part of the reason why defects are more prevalent in areas farther south or where the environment is more humid, because you can capture heat in the humid nighttime air."

Similar to sugar ends, SECD is more likely to occur in potatoes infected with *Verticillium dahliae*. "Verticillium can plug up the tuber's vasculature, which may prevent leaves from cooling down during the day," says Bethke.

Other traumas to a potato field that can increase a crop's risk of SECD include defoliation due to hail or insects. "Fields hit by hail had severe stem-end chip defect," he says. Also, insect swarms that really knock the plant canopy back as they move through a field can cause SECD, he adds.

To simulate these conditions in a laboratory, Bethke shut down the photosynthetic process by growing potato plants in low light for a week, which increased the severity of SECD in the tubers.

"Lots of things can cause the defect. That's one of the reasons it has been difficult to predict, but environmental stress seems to be the biggest factor, in general," he says.

So far, crop management hasn't been the answer for decreasing the incidence of SECD. Trials studying planting depth and planting date haven't provided solid solutions. One thing that is clear is the damage from stress results in a cumulative effect on defect severity. "In the case of nighttime temperature, [defect severity] seems to be cumulative — seven episodes over the course of the summer is worse than three episodes."

VARIETY CHOICE

Currently, variety choice is the best option to manage SECD. Growers who have experienced problems with SECD can select varieties that are less susceptible to defect formation, if that is an option for them, says Bethke.

For example, Snowden is a long-time, popular, chipping potato variety, which is also susceptible to SECD, as is the variety Atlantic. "One of the reasons you might not want to store Atlantic is it can get really beautiful defects," says Bethke.

The variety Lamoka has shown a little more tolerance to SECD than Snowden. However, some varieties, such as Manistee and Niagara have shown good resistance to stem-end chip defect. Although less studied, data suggests the variety

Nicolet has some resistance, as does the variety Pike, says Bethke.

One other area Bethke is exploring to help solve the SECD problem is biotech potatoes. He's worked on studies where the vacuolar invertase gene in potato has been silenced. He found when the gene is suppressed, the SECD severity is reduced in chipping potatoes. Sugar end disorder was also decreased when the invertase gene was suppressed.

"This technology can offer improvement here. Whether or not it's the right solution — that's a whole different question. However, there's definitely potential there," says Bethke.

MANAGING SECD IN STORAGE

Because the environmental conditions favouring SECD don't occur every year and, therefore, not every year is a SECD year, even growers who have seen a lot of the defect on their farms have a hard time predicting how bad or how good the crop is going to be coming out of storage, which can make managing storage of the crop difficult.

However, once the crop is in storage, potatoes with SECD could improve over time, says Bethke. He recommends growers follow standard, good management practices for chipping potatoes.

"There's some hope in that after a month or two of getting worse, the defect tends to slowly get better. Manage your potatoes as best you can during that period. This is just opinion, not science, but any other stresses you impose in storage that cause potatoes to go off-colour or cause sugar profiles to go up, it's probably going to exacerbate the difficulties you have with stem-end chip defect," he says.

"It's the same management strategy you use for your very best potatoes — lots of fresh air, don't cool them too fast and don't cool them too far. Check the sugars as you drop the temperature to make sure nothing is going to spike or seems to be creeping in."

There is still much research to be conducted on the disorder, admits Bethke. However, it hasn't been difficult to keep the researcher focused on stem-end chip defect.

"From a research point of view, it's a fascinating puzzle. You have a potato vine in a field. There's an environmental stress, but there's nothing apparent that tells you you're going to have problems for potentially two months. Somehow, those potatoes remember that environmental stress, and after harvest, respond to whatever that stress was. What is the nature of the biochemical memory of environmental stress that gets you stem-end chip disorder? That's an interesting question." ○

eye on the nation



MANITOBA

Dan Sawatzky, General Manager,
Keystone Potato Producers Association

The crop in Manitoba is progressing well. Planting was only slightly behind normal but cool May weather delayed emergence putting the crop three to five days behind. Dry conditions contributed to little seed rot being reported in spite of the delayed emergence resulting in good stands. Another observation with delayed emergence is the even staging of the crop development across the province. June weather has improved to bring the Growing Degree Days within 15 to 25% of normal since planting. Precipitation ranges from 40 to 75% of normal for the period from May 1 to June 15.

Although spring runoff and capture of water flows allowed for the filling of almost all off stream reservoirs, rivers are very low causing some concern for irrigators dependent on those sources. Timely rains will be needed to help the crop reach its full potential.

Acreage is projected to increase to meet the increased capacity of the Simplot expansion scheduled to come on line in January 2020. Yield goal targets have also risen keeping pace with increasing yield trend lines. Growers continue to move yields up with adopting new technology, tighter management and increased plant populations through narrowing row spacing.

Growers are signing process contracts at the time of this writing having come to an agreement earlier this month. With the increased demand through growing markets and consumption there is some optimism within the industry. The challenge remains to match supply with demand in an efficient manner trusting that Mother Nature will cooperate.

Manitoba is excited to host PAA (Potato Association of America) July 28 to Aug. 1 in Winnipeg. This conference will attract potato researchers from across North America and beyond. We invite all readers to attend and learn about different areas of research including the symposium on Changes and Challenges in the Potato Marketing sectors.

Other local research field days include Crops-A-Palooza on July 24 and the potato field day on Aug. 14 both held at the Carberry CMCDC center.



NEW BRUNSWICK

Jean-Maurice Daigle, Director of Market
Information, Potatoes New Brunswick

The 2018 New Brunswick crop is cleaning up quickly. With the early frosts, wet fall and potatoes left in the field, this year's crop is very different than the 2017 crop. Lower yields, lower payables and rough, immature tubers have caused supply within the province in all sectors to be tight. Processors will likely run out of potatoes two weeks ahead of last year's crop. Potato prices are high due to a lack of supply.

The 2019 planting season got off to a slow start, but with Mother Nature's cooperation we finished planting around June 7. For the most part, weather has been cooperating and we are off to a great growing season, some even suggest we have caught up from the delay in planting!

Processing potatoes from within New Brunswick and neighbouring provinces are in high demand this year, therefore we expect to see an increase in planted acres in the province.



SASKATCHEWAN

Matthew Lawless, President, Saskatchewan
Seed Potato Growers' Association

Spring and early summer 2019 have been busy, but productive, for the Saskatchewan seed potato industry. Last year's crop stored reasonably well for most growers, considering the challenges throughout September and October of 2018 with rain, snow, and heavy frosts. Top-quality Saskatchewan seed potatoes were once again shipped to customers across Canada and the United States from mid-March until early June.

Mid to late April weather across the province was favourable for tillage work and fertilizing ahead of planting. The first week of May came in very cool and wet, and this delayed planting operations. Once conditions improved, the weather cooperated for planting operations each and every day for the next four weeks, allowing growers to have all of their acres planted by the end of the first week of June. The crop is emerging evenly with exceptional vigour. Currently, the earliest planted acres are at row closure or have just passed the point of row closure.

The province of Saskatchewan is experiencing a severe drought this growing season, and growers who have the ability to irrigate have been doing so since the middle of May. Some timely rainfall has occurred in the last 10 days (up to 125 mm), but the ground is still so dry that some growers are irrigating even after two to three inches of rainfall. As a positive, the dry, hot weather has kept disease and weed pressure low.

The members of the Saskatchewan Seed Potato Growers' Association wish their fellow potato growers in Canada, and beyond, a safe and productive summer growing season.



ONTARIO

Kevin Brubacher, General Manager, Ontario Potato Board

Ontario producers are expected to plant approximately 34,000 acres of potatoes this year. This estimated acreage will be verified or changed by mid-July when a planted acreage survey is complete. Planted acreage is very much in line with what was planted last year in the province.

The first early planted potatoes went into the ground in early March, but growers were slowed down due to wet and cold weather. Poor weather conditions across the province delayed planting in many areas. As a result, planting is slowly coming to an end at the time of writing this in mid-June. This is very late in comparison to most years. There will certainly be lost acreage due to the cold and wet spring.

We are finally seeing more seasonal weather which is progressing the crop nicely.

In August, we will be hosting two very informative and well attended events. Please join us on Aug. 21 for the Potato Research Field Day at the Elora Research Centre, hosted by Vanessa Currie from the University of Guelph. One of our biggest events of the year is Dr. Eugenia Banks' Ontario Potato Field day at HJV Equipment in Alliston, Ont., on Aug. 22. Please join us for these worthwhile and enjoyable events.



BRITISH COLUMBIA

Hugh Reynolds, Reynelda Farms, Delta, B.C.

Good weather has allowed for good sizing on our potatoes with skin set on the reds available in late July. The whites have been ready through June. We heard at the Transition Meeting that there will be a midsummer shortage of good potatoes. Also, that the Eastern harvest will be late and lower yield than normal. Unfortunately, British Columbia's small acreage will not allow us to be much help to the East.

I am urging B.C. growers to hold off top killing to maximize full sizing and put them into storage. This fall and winter supply and demand will be closely aligned, which will allow for fair pricing throughout the coming year and especially for count sizes.

In Minneapolis, at the Transition Meeting we were warned that some dealers are trying to insinuate themselves between the shippers and the buyers. They will flip our potatoes keeping our profits in their pockets. Before you fill your truck ask to know the destination and ask for the price. We also heard of retroactive price drops. If we ship carefully as the market requires there is no need for the price collapses that we traditionally have seen. Remember that many shippers are more interested in selling their bags at set prices than our potatoes that are in them. Good Luck.



QUÉBEC

Clément Lalancette, Directeur General, Les Producteurs de pommes de terre du Québec

As some other potato areas, our spring (can we call it a spring?) was cold and wet for the most part. We estimate the crop delay to be between seven to 10 days in most areas. Nothing to worry about, so far. But some growers indicated to us that crop development seems to be unequal in fields. It is too early to predict a potential yield.

The seeding is mostly completed, but the development level varies a lot from colder areas to warmer ones. Some seed rot related to cold and humid soil has been noticed.

The news concerning the market is better, since the pipeline is empty and the demand for processing potatoes continues to be strong. So, we could be relatively optimistic about the new marketing season, but let's be careful. The last season was good if we look at the average prices, but quality was an issue, with more small potatoes and deformed ones.

Have a good season!



PRINCE EDWARD ISLAND

Jason Hayden, Chairman, P.E.I. Potato Board

It's good to be back on the land again, with the promise of a new crop ahead. The cool and wet conditions delayed planting somewhat this spring, but crops are starting to emerge, and with the early moisture and warming temperatures crops are growing quickly.

Sprayer calibration workshops were held across the province in late June. Those tailgate sessions provided a lot of valuable information, and in addition to the calibration work, there were short but important presentations relating to due diligence with regard to meeting environmental regulations. The board continues to have discussions with federal officials regarding environmental issues, with the intent of finding ways to work together in a more collaborative and productive way.

A lot of Island fields suffered erosion damage this winter and spring, as cover crops either failed to establish after seeding, or fields simply could not be seeded due to the freeze up. We know cover crops are very important in terms of protecting soil, but we are also learning of other major benefits including increasing organic matter, decreasing leaching and increasing yields. We hope to see a major increase in cover crop use this fall and encourage growers to look at the information on the PEI Agronomy website for information on cover crop options (<https://peipotatoagronomy.com/>).

Best Wishes to all growers for a safe and successful growing season in 2019!

eye on the nation



ALBERTA

Terence Hochstein, Executive Director,
Potato Growers of Alberta

Although about seven to 10 days behind last year's crop, the Alberta crop still is at the long-term average as far as crop development is concerned. With our cold and dry spring, some of our processing crop laid in the ground for six weeks before it emerged. Despite this delay, we have found very little seed piece decay, just slower development. There is, however, some indications that we have some varieties that have already got egg-sized potatoes under them.

Although moisture has been sporadic at best in the south, the cooler weather has allowed the irrigation to keep up. Our dryland seed areas are all reporting good to excellent moisture at this time, with hopes that it keeps coming on a weekly basis.

Our overall acres have increased in Alberta this year with the processing industry adding an additional 5,040 acres to meet the needs of the current expansion in Alberta. The biggest surprise is the 2,170-acre increase in the seed industry. It was anticipated that this sector would increase as the need for more processing acres increases but not a 20% increase in one year.

The Cavendish plant in Lethbridge is still scheduled to come on line this summer in time to take on the new crop harvest. Currently, it is running some old crop through to get everything up and functioning properly.

Plans for the Alberta Potato Conference and Tradeshow in Red Deer Nov. 19 to 21 are well underway. It is not too early to book your room and register if you are planning to attend. Please call the office for more information.

The PGA launched a new, updated website earlier this spring. Check it out to see what our industry is doing as we move forward to a very promising future <https://www.albertapotatoes.ca>.

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Co-founder, Carter Cattle Company Ltd.
Lacadena, SK

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Total potato storage holdings were down 18.5 per cent on June 1 compared to the year before due to lower volumes and storage issues.

 **CANADA'S POTATO STORAGE** holdings as of June 1 totalled just under 16.4 million hundredweight, according to figures from the United Potato Growers of Canada. That's an 18.5 per cent decline from the same period a year ago, when total holdings amounted to a little over 20.1 million hundredweight of potatoes.

In Eastern Canada, the year-to-year decrease was just over 22 per cent mainly due to substantial declines in storage holdings in Prince Edward Island and New Brunswick. Led by the nearly 29 per cent decline in Manitoba, Western Canada saw a drop in potato storage holdings of almost 14 per cent.

Interviewed by *Spud Smart* in June, Kevin MacIsaac, general manager of United Potato Growers of Canada, said you'd have to go back seven years to see Canada's potato stocks so low at the end of the reporting season.

MacIsaac said last year's difficult harvest resulted in storage issues for many producers, but the main reason for the drop was fewer potatoes actually made it into the bin due to the many acres left unharvested in most potato-producing provinces.

"British Columbia is the only one that has more potatoes in storage than a year ago," he said.

According to MacIsaac, potato stocks destined for processing were down in all provinces and were the lowest they'd been on June 1 since before the French fry market expansion began about three years ago. For this reason, he said, processors would continue to be squeezed for supply until the new crop became available.



KEVIN MACISAAC

"Potatoes are coming in every day to Manitoba and especially P.E.I. to feed those plants. The only way that we're able to get to the end of the storage season is on imported product."

"We're almost three million hundredweight or 16 per cent below where we were a year ago. There's no way that the numbers work on that, and so what's been happening is provinces have had to import potatoes to keep their processing plants going," MacIsaac said.

"Potatoes are coming in every day to Manitoba and especially P.E.I. to feed those plants," he added. "The only way that we're able to get to the end of the storage season is on imported product."


MacIsaac said these potatoes were coming in from Idaho, North Dakota and Maine, and in this country, from Alberta.

"Alberta is the only province in Canada that has had some ability to supply the other areas," he said.

On the fresh side, table stock potatoes were down more than 31 per cent from a year ago and lower than they'd been since the end of the reporting period in 2010.

As a result, many packing sheds are currently only able to supply their long-term customers, MacIsaac said, also adding that the fresh storage situation heading into summer would have a positive effect on pricing and profitability for producers.

MacIsaac said Canadian seed holdings on June 1 were down 61 per cent compared to last year, which would limit the transfer of flex potatoes into other sectors once planting was complete.

 **IN THE UNITED STATES**, the U.S. Department of Agriculture announced the 13 states that report potato stocks had 67.4 million hundredweight of potatoes in storage on June 1. That exceeded year-earlier holdings by 3.6 million hundredweight, a 5.7 per cent increase.

MacIsaac said the old crop appeared to be moving out at a good clip south of the border, which was encouraging news for processing potato growers in Canada.

"The pipeline will be empty in most states with the exception of Idaho, so that's always nice," he said. **o MARK HALSALL**

Canadian Potato Storage Holdings (000 cwt)

Province	2019 June 1 Holdings				2018 June 1 Holdings				Total Holdings % Change
	Fresh	Process	Seed	Total	Fresh	Process	Seed	Total	
Prince Edward Island	617	3,863	24	4,504	895	4,773	0	5,668	-20.5
New Brunswick	243	2,042	0	2,285	658	2,500	176	3,334	-31.5
Quebec	663	593	13	1,269	608	661	64	1,333	-4.8
Ontario	81	578	3	662	154	714	0	868	-23.7
Manitoba	179	2,871	0	3,050	320	3,953	0	4,273	-28.6
Alberta	11	4,500	32	4,543	19	4,555	48	4,622	-1.7
British Columbia	40	0	41	81	6	0	5	11	636.4
Total Canada	1,834	14,447	113	16,394	2,660	17,156	293	20,109	-18.5

SOURCE: UNITED POTATO GROWERS OF CANADA

INDUSTRY NEWS

PRODUCT NEWS

Proposed Registration Decision for 1-Octanol and 1,4Zap

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the Pest Control Products Act, is proposing registration for the sale and use of 1,4Zap Technical, and 1,4Zap, containing the technical grade active ingredient 1-octanol, for post-harvest application on stored potatoes to control emerged sprouts in ventilated storage facilities only.

An evaluation of available scientific information found that, under the approved conditions of use, the health and environmental risks and the value of the pest control products are acceptable.

A fatty alcohol compound, 1-octanol, when applied to potato tubers in storage, controls sprouting, thereby improving tuber longevity and maintaining tuber quality.

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BASF to Discontinue All Metiram-Containing Products

In accordance with the recent Pest Management Regulatory Agency (PMRA) decision regarding products containing Metiram, BASF will be discontinuing

all Metiram-containing products according to the PMRA-mandated phase-out schedule below.

The Metiram active ingredient is available commercially as Polyram® DF (PCP: 20087) (a stand-alone Metiram formulation) and Cabrio® Plus (PCP: 30395) (a co-formulation of Metiram and Pyraclostrobin).

- BASF may only sell Cabrio Plus or Polyram DF prior to December 31, 2019.
- Distributors and retailers can continue to sell Cabrio Plus and/or Polyram DF until June 21, 2020.
- Growers can continue to apply Cabrio Plus and/or Polyram DF until June 21, 2021.

Compliance with the phase-out dates is mandatory.

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PEOPLE NEWS

25 Years and Still Going Strong: McCain and Day & Ross Celebrate Long-Service Employees

Thirty-nine employees from McCain Foods Canada and The Day & Ross Transporta-



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Farm Operations Foreman/Forewoman
Barrich Farms (1994) Ltd. is a large grower of high quality seed and table potatoes, located in Outlook, Saskatchewan. We are currently accepting applications from individuals interested in working for us as our Farm Operations Foreman/Forewoman (assistant to the Farm Operations Manager). We encourage all qualified candidates to apply with a resume and/or CV, and include a minimum of three (3) references. A thorough training program will be offered to the successful applicant.

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Contact: Matthew Lawless
matthew@truenorthseed.com
306-867-9233



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tion Group were honoured for 25 years of service during the 2019 Awards Banquet held recently at the Delta Hotel in Fredericton, NB.

Master of Ceremonies was Luc Marcoux, General Counsel, Day & Ross Inc., who shared a congratulatory message from president and CEO Max Koeune, which included "Family is at the core of our company values; it is ingrained in our history and remains just as important to us today. Your loyalty and commitment to over 25 years of growth and changes serves as a great testament to those values."

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CIP Bestows Scientist Emeritus Status on Three Outstanding Researchers

The ability of the International Potato Center (CIP) to develop and deploy science-based solutions for the main challenges faced by farmers and others involved in food systems in developing countries is the result of the collective knowledge, creativity and dedication of its researchers. In recognition of the achievements of three of those researchers – Dr. David Ellis, Dr. André Devaux and Alberto Salas – CIP Director General Barbara H Wells recently named each of them a Scientist Emeritus in a ceremony attended by the CIP Board of Trustees, management and staff.

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Minister of Agriculture and Agri-Food Tours AAFC Fredericton Research Centre

Minister of Agriculture and Agri-Food, Marie-Claude Bibeau, toured the Agriculture and Agri-Food Canada Fredericton research centre April 23 to learn about the department's research into all things potatoes. The visit included a stop at the centre's Potato Gene Repository with Fredericton scientist Benoit Bizimungu.

The repository contains Canadian and international potato germplasm. Potato research is the centre's main focus with an emphasis on potato agroecosystem, bioecology, potato germplasm enhancement and enhancing the environmental performance of potato production systems.

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WPC Welcomes Dr. Nigel Crump as its New International Advisor, Oceania

World Potato Congress president, Romain Cools, is very pleased to welcome Dr. Nigel Crump to its International Advisory Committee. "Dr. Crump is an excellent addition to our highly respected professional group of International Advisors. With Nigel's addition, we now have potato specialists representing all parts of the world."

Dr. Nigel Crump is a potato pathologist with over 19 years' experience working in the Australian potato industry. Nigel is the general manager for the Australian Seed Potato Industry Certification Authority (AuSPICA), which is an industry-based organization that operates the seed potato certification scheme in South Australia, Victoria, and northern New South Wales.

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INDUSTRY NEWS

Senninger Welcomes New Area Manager

Senninger is proud to announce the recent hire of Martin Porter, who joins the International Department as Senninger's new area manager for Australasia. Porter's hiring reinforces the company's appreciation and continued commitment to the territories in Australasia by providing a better support to their growing irrigation market segments.

Porter holds a certificate in Business and Administration from Griffith University in Queensland, Australia. He's been in the irrigation industry for more than 25 years and has great experience in the overhead irrigation market in Australia, New Zealand, and South East Asia.

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BUSINESS NEWS

IBM Provides Global Agriculture Solution

IBM has announced the global expansion of Watson

Decision Platform for Agriculture, with AI technology tailored for new crops and specific regions to help feed a growing population. For the first time, IBM is providing a global agriculture solution that combines predictive technology with data from The Weather Company, an IBM Business, and IoT data to help give farmers around the world greater insights about planning, plowing, planting, spraying and harvesting.

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INDUSTRY NEWS

2019 Ontario Potato Field Day Announced

Summer has officially begun, and it is the perfect time to mark your calendars. The 2019 Ontario Potato Field Day, hosted by HJV Equipment and supported by the Ontario Potato Board, will be held on Thursday, August 22, at HJV Equipment in Alliston, Ont. The event starts at 3:00 p.m. followed by a barbecue provided by Syngenta.

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2019 McCain Clear Lake Golf Classic Raises \$106,000

On June 11th, 2019, the Manitoba McCain Plants hosted the McCain Clear Lake Golf Classic, in partnership with Ronald McDonald House Charities Manitoba (RMHC Manitoba). Each year McCain holds the golf tournament to raise funds for RMHC Manitoba, a wonderful organization devoted to keeping families with sick children together and near the care and resources they need.

Event co-chairs Leonard Birch and Dean Melnic presented Wendy Galagan, chief executive officer of RMHC Manitoba, with a cheque in the amount of \$106,000, the largest amount raised to-date, bringing the total amount raised for this wonderful charity to just over \$1.9 million.

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Cornell Improves Global Access to Potato Breeding Material

Cornell's plant breeders and geneticists have played a significant role in the improvement of the potato, having released more than 50 varieties since 1908. Cornell researchers are now expanding their efforts to make more wild potato seeds available to potato breeders around the world.

With support from the Wallace Genetic Foundation, Cornell scientists continue their efforts in the Cornell-Eastern Europe-Mexico (CEEM) International Collaborative Project on Potato Late Blight control to facilitate the transfer of disease-resistant potato germplasm among global potato centers in the United States, Russia, Poland, Mexico and Peru.

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AgriExpo 2019 To Be Held August 14 – 15 in Grand Falls, N.B.

Valley Chamber of Commerce, Potatoes NB, and Master Promotions Ltd. are working in partnership to bring AgriExpo 2019 to Grand Falls, N.B. The agriculture-focused event will showcase new trends, technology and equipment for farming sectors across New Brunswick, Quebec and Maine. ○

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NORTHWESTERN EUROPE

Based upon a provisional estimation of the North-Western European Potato Growers (NEPG), the area in the five largest potato countries increased to 609,000 ha of consumption potatoes. This is the largest ever. Although it is not the final area figure, the estimations show a growth of 2.4 per cent compared with last year and 8.4 per cent compared with the five-year average. All potato countries on the continent show growth, with France and Belgium at the top.

The fear of lack of seed potatoes to grow more area was not so realistic (more smaller sizes used, more seeds cut), even if prices have increased. Also, production costs, due to higher seed costs and sometimes higher land rents, will probably be higher than those of last year. For Great Britain it is still too early to make a first estimation, so here it has been calculated with the five-year average. However, any growth in area may be capped by last year's challenging season and high seed prices.

In all five countries, planting was earlier, however due to the cold start of the growing season the crop is now on an average level. The early processing potatoes in Germany and Belgium will be harvested mainly during the middle of July (with the first ones, at very low volumes, at the end of June) which is one week later than average.

During the last NEPG meeting, members agreed the growth of the area is in line with the trend of growing demand for processing and export. The NEPG emphasized it is always the yield and not the area that will make the final harvest quantity, and the growing season is still long. As there will be no carryover of the 2018 harvest, the next potato season will be longer than usual and might need more potatoes. The actual extreme low amount of free potatoes in stock and the later arrival, by

one week, of the early processing harvest, will be a challenge for the processing industry as they are hungry for raw material.

All countries see large challenges for the water situation, as the levels in reservoirs and wells and ground reserves are much lower than average. Rain is needed for the crop and to guarantee the possibility for irrigation where possible. Some restrictions have already been made. SOURCE: NEPG

SCOTLAND

The seeds have been sown for the creation of a world-leading potato hub in Scotland, designed to give those working in the £200 million-plus (\$335 million-plus) industry instant access to expert advice.

The country's three main knowledge, consultancy and research centres for the crop have joined forces on the project, which is designed to drive innovation and commercialization.

The new partnership between Scotland's Rural College (SRUC), the James Hutton Institute and Science and Advice for Scottish Agriculture (SASA) will also aim to tackle key challenges facing the industry, including the pressure to produce more sustainably using fewer pesticides and the market challenges post-Brexit.

Gerry Saddler, Chief Plant Health Officer for Scotland and Head of SASA, said: "It is important for our organizations to work together to identify the key challenges facing potato production and markets in Scotland, as well as its value in driving innovations which meet and solve those challenges."

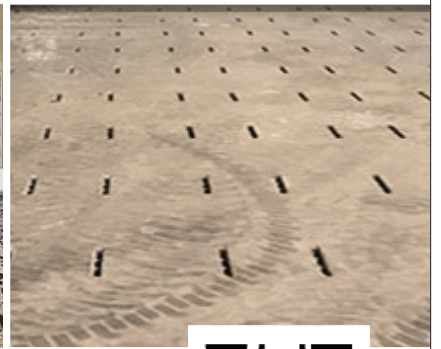
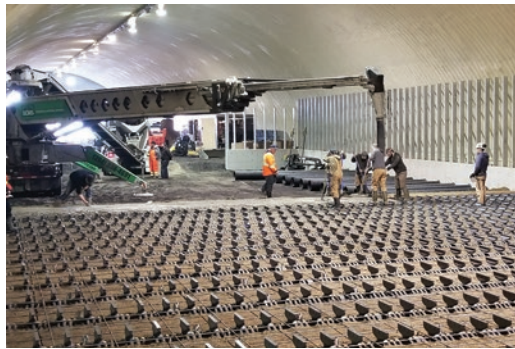
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A Manitoba Farming Life is Tough to Beat

JASON KEHLER has been helping grow potatoes on the family farm in Carman, Man., since he was 12 years old. Some 30 years later, he can't imagine doing anything else.

"I've always wanted to farm since I was probably old enough to say the word," says Kehler, who's a fourth-generation farmer and second-generation potato producer.

"I love what I do. I enjoy the challenge, the people, and just watching Mother Nature make things grow," he adds. "I think it's a pretty tough life to beat."

Kehler and his wife, Laura, operate Kehler Farms Ltd., which encompasses 6,500 acres of farmland. That includes close to 1,200 acres of Russet Burbank potatoes the Kehlers produce each year for McCain Foods and Simplot. They also grow corn, wheat, oats, canola and edible beans.

Kehler, who calls himself a very hands-on farm manager, says he spends a lot of his time out in the fields. Laura is the office manager and she's also kept very busy making meals for family and farm workers and taking care of the couple's two children — seven-year-old Paisley and five-year-old Wyatt.

"Her contributions are vast," says Kehler.

Eight to 10 people work at the farm year-round, with that number growing to about 25 at harvest time. Kehler says he and Laura recently hired a chief financial officer to share some of the management and administrative duties.

As the farm has become more profitable, it's expanded in recent years, with the potato acres tripling in size since 2014. "We've gone from three circles to nine," Kehler says.

PROGRESSIVE GROWERS

The Kehlers consider themselves progressive growers and they're always open to innovative technology and new ideas, like moving from 38-inch rows to 34-inch rows in their potato fields about four years ago. Kehler says it's resulted in better yields and quality, and they're looking to go to 30-inch rows in the future.

They were also the first in their area to adopt variable rate fertilization, which Kehler says has improved the quality and consistency of their potato crops. In addition, the farm has moved to centre pivot irrigation and every potato acre is now on drain tile.



The Kehler's are striving to lay a solid foundation for a third generation of potato growers.

PHOTO: SANDY BLACK

"We really feel that we've advanced our growing technology on the farm," Kehler says.

The Kehlers' innovative efforts have not gone unnoticed. Two years ago, Kehler and his wife earned the title of Manitoba's 2016 Outstanding Young Farmers.

"It was a great honour, not only for Laura and myself, but I really felt it was an honour bestowed upon our family farm," Kehler says. "It was very much a generational effort. Yes, Laura and I were recognized, but [the award] was really a result of the

efforts of my mom and dad and my grandma and grandpa and so on."

Kehler says he and his wife have been striving to lay a solid foundation for what would be a third generation of potato growers, if their children decide to take up farming one day.

"When I'm in my 50s, I want to have a financially secure operation that my kids will have an opportunity to take over if they choose," he says. "I don't want them to farm if they don't want to, but that's my dream." ○ MARK HALSALL

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