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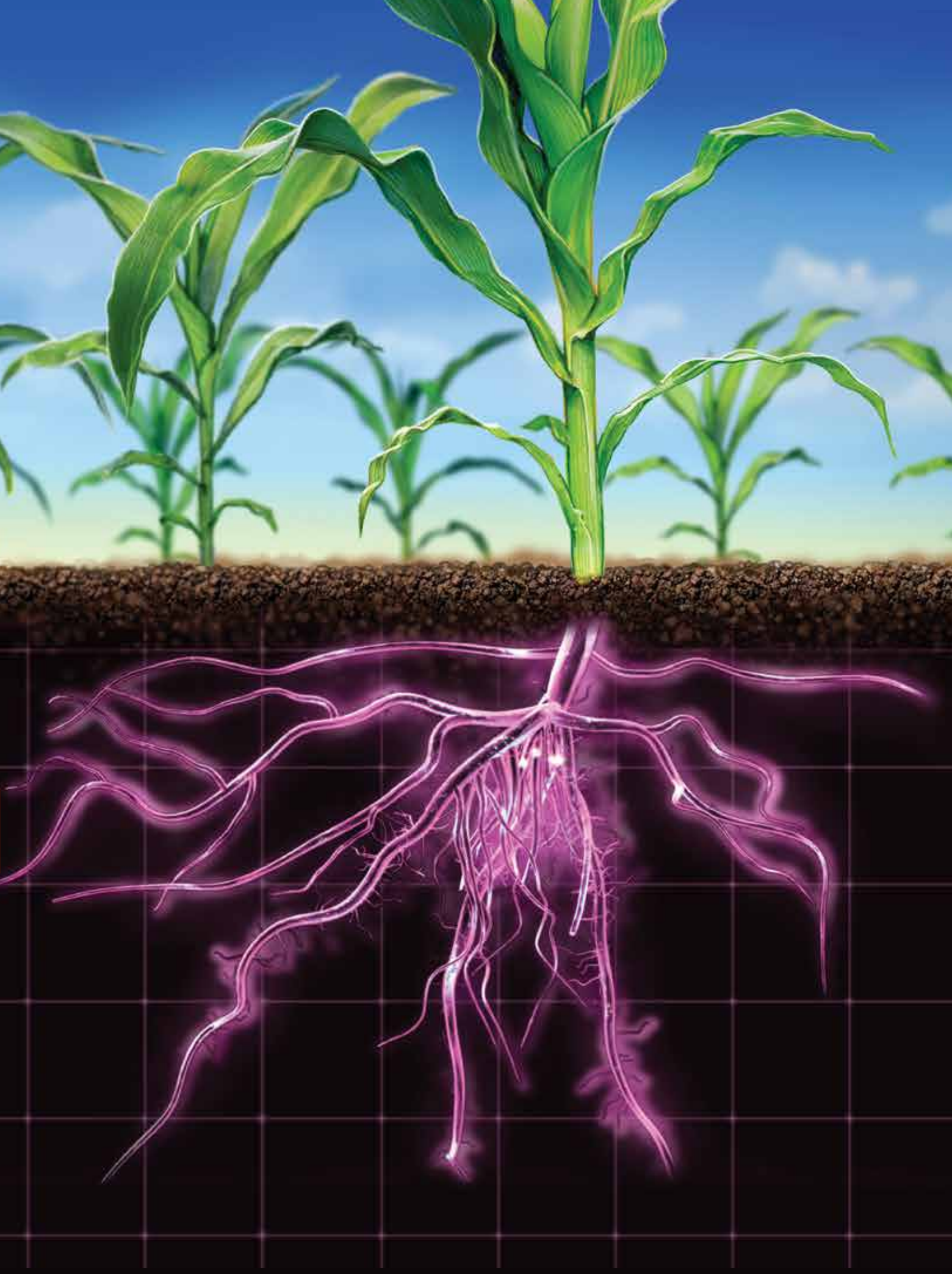
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BEHIND THE LINES

Reflecting on one of my farm dogs

Indiana, one of my family's dogs, was perhaps similar to the pets found in many farm households. She wasn't a purebred; rather, she was a German shepherd cross. And while she was certainly a family pet, she was also expected to contribute to the household.

She served as a guard dog for our home and barnyard, although, truth be told, Indy performed this role with varying levels of success. She certainly barked to announce the arrival of any unfamiliar vehicles or equipment. And, given her breed, she may have looked a bit

intimidating to some visitors. But for those individuals brave enough to get out of their vehicles, Indy's chosen method of attack was a ferocious lick or two.

Indy was better suited to protecting the family from the uninvited animals that made it onto the property. Many a time we would go outside to find out why she was barking and would discover that she'd 'treed' yet another critter – a racoon, a squirrel, and even the neighbour's cat.

Sadly, Indy passed earlier this fall.

It seems fitting that while I've been trying to process her death (loss never gets any easier on the farm, despite the periodic exposure), I've read **Jim Algie's** feature article on farm dogs. It explores the roles dogs play in farm operations and households and outlines some tips to help ensure their safety. I hope you enjoy Algie's article – and the rest of the magazine. Maybe his article will also allow you to reflect on the dogs (and cats) who are, or have been, part of your family. **BF**

ANDREA M. GAL

FARM WEATHER REPORT

Seasonal CHU accumulation and yields

Corn Heat Unit accumulation ceases once the first killing frost occurs at -2 C, or when the average daily temperature for three consecutive days falls below 12.8 C. This year, Windsor fell into the latter camp. In total, Windsor had a huge CHU accumulation of 4,000 – well above the normal accumulation of 3,612. Mount Forest had a frost on Oct. 10, ending the growing season at a CHU of 3,231 – which is 203 CHU ahead of its 30 year average. Overall, the province received ample heat to mature the crops.

In locations where rainfall was timely, soybean yields were exceptional, falling in the 50- to 60-bushel per acre range. The fall weather supported a rapid soybean harvest.

In terms of the corn crop, Essex County farmers reported some excellent early yields at 240 bushels per acre. Other growers reported yields in the 175- to 200-bushel range. Warmer weather assisted in drying the corn to levels less than 21 per cent moisture. Typically, corn moisture levels would be above 28 per cent in the midfall. The lower moisture offers farmers an opportunity to save \$40.00 or more per acre on drying costs. **BF**

Dale Cowan is a senior agronomist with AGRIS Wanstead Cooperatives. Data from WIN and the Ag Grower Daily Dashboard Program.



Stacey Newman/istock/Getty Images
Plus photo

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WHAT YOU NEED TO KNOW FOR YOUR PROPERTY

Every four years, the Municipal Property Assessment Corporation (MPAC) updates assessments on all properties for tax purposes, including farm property. The Ontario Federation of Agriculture (OFA) has always worked with MPAC to advocate for a fair assessment process for farm property.

New assessed farm property values were mailed out on October 11. When you review yours, here are some things to keep in mind

- ✓ Check that your property is still properly classified in the “farm class tax” on your assessment form.
- ✓ Review your assessment at **aboutmyproperty.ca** to check the details used to value your property.
- ✓ Do you agree with the new assessment – knowing it is based on the value of the property if it was sold on January 1, 2016?
- ✓ If you don’t agree with MPAC’s assessed value, you have the option to file a “Request for Reconsideration” with MPAC by the deadline printed on the Property Assessment Notice. The RfR form is available online at **mpac.ca**.

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Autonomous tractors: What's a farmer to do?



CNH Industrial photo

New Holland and **Case IH**, agricultural brands of **CNH Industrial**, both unveiled futuristic prototypes for autonomous field tractors at this year's Farm Progress Show in Boone, Iowa.

Nobody's saying much about how soon self-driving tractors will become commercially available. But it's happening more quickly than expected by **University of Manitoba** agricultural engineering researcher **Dr. Danny Mann**.

The use of driverless field machines poses a number of questions Mann and his graduate students hope to answer about how radical automation changes field work.

"Maybe not from a technical standpoint, but I think there still will be some challenges to figure out exactly how these machines are going to be utilized," said Mann, who referred also to potential legal liability issues for driverless tractors.

The Case IH prototype is based on a cab-less redesign of the company's Magnum tractor, the company's website says. It features radar and LiDAR (laser-sensing) guidance and onboard video cameras.

The New Holland prototype is similarly automatic but maintains the cab, outward appearance and operator functions of the company's T8 Blue Power tractor line.

CNH Industrial collaborated with **Autonomous Solutions Inc.** of Utah on both concept tractors. **BF**



CNH Industrial photo

Hamilton grain exports start early

An expected bumper Canadian crop saw earlier than usual grain exports through the expanding Port of Hamilton, Port Authority spokesperson **Larissa Fenn** said in an interview.

As of Aug. 31, almost 500,000 tonnes of grain had moved, up more than 50 per cent from the previous year, Fenn said. She cited greater quantities of 2015 crop corn. Port officials expected shipments would return to "more typical volumes" as the 2016 harvest proceeded.

Elsewhere, the Hudson Bay Port of Churchill, Manitoba remained closed through September following July announcements by U.S.-based **OmniTRAX**. But other elements of Canada's grain transportation network had geared up early for the expected record harvest.

In an Aug. 17 statement, **Canadian Pacific CEO E. Hunter Harrison** declared his rail company's readiness and cited major, new capital investments to avoid snags experienced during the winter of 2013-14.

Hamilton is part of that new investment having grown rapidly in recent years. Investments by established grain handlers, **Parrish & Heimbecker Ltd.** and **Richardson International Ltd.**, have helped Hamilton become the province's "largest gateway for Ontario-grown grain" handling corn, wheat and soybeans. The city is also home to oilseed crushing facilities operated by U.S.-based **Bunge Ltd.**

Also this year, **G3 Canada Ltd.** began construction in Hamilton of a third grain-export terminal to be in service for the 2017 harvest. It brings recent capital investment in agri-food-related facilities for the Port to more than \$200 million, Fenn said. **BF**



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Easing neonic regulations?

Huron-Bruce MPP Lisa Thompson has proposed amendments to the **Pesticides Act**, and specifically the neonicotinoid regulations, with a private member's bill.

Bill 4, Supporting Agricultural Experts in their Field Act, 2016, is intended to make these regulations "more workable," according to Thompson.

As the Act currently stands, beginning August 2017, **Professional Agrologists** (P.Ags) and **Certified Crop Advisors** (CCAs) associated with manufacturers or retailers of a Class 12 pesticide cannot serve as professional pest advisors. (By 2019, under the current regulations, farmers must have professional pest

advisors complete soil inspections in order to plant neonicotinoid-treated seed.)

Bill 4 would eliminate these exclusions and enable the currently ineligible CCAs and P.Ags to "be out there in the field, doing their jobs," says Thompson.

Laura Johnston, CCA-ON, is a territory manager with **Maizex Seeds Inc.** and one of the CCAs who is currently ineligible to work as a professional pest advisor.

"Personally, I think the proposed amendments would be a benefit both to agriculture and growers," says Johnston. Farmers would be able to work with CCAs and P.Ags with whom they've developed relation-

ships, such as their crop input retailers, says Johnston.

Bill 4 passed first and second readings in mid-September.

The Bill has been referred to the Standing Committee on General Government. According to the Legislative Research Service, the Committee will examine the bill, consult witnesses and vote on amendments. Thompson said she hopes the committee will complete its examination "as quickly as possible," given the August 2017 implementation date for the current regulations. **BF**



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Drone crop imagery still needs work



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Despite rave reviews of unmanned, aerial vehicles in agriculture, techniques for drone-based crop assessments still need work, **University of Guelph** plant scientist **Dr. Mary Ruth McDonald** said in a recent interview.

A July article posted to the **Massachusetts Institute of Technology's** *Technology Review* website described agriculture as “among the most promising areas” for drone applications. **The Economist's** recent online *Technology Quarterly* recommended drone use as part of an upbeat survey of the future of agriculture.

Current research on Holland Marsh vegetable crops by McDonald and her colleagues compares aerial imagery with scouting by ground-based, human observers. She's interested primarily in the biology of pest management in vegetable crops and says there's a future for agricultural drones in her world but it's not there yet.

Guelph researchers have matched ground observations with both coloured aerial, photographic images and near-infra-red imagery measuring heat. Aerial photos do show areas of weed infestation and poor plant germination, as well as soil structure issues.

But, according to McDonald, the imagery does not yet provide an advantage over ground-based scouting.

“There's where we'd like to be; so that we can see those subtler differences in the aerial pictures before it's really obvious to the naked eye.” **BF**

Online hub targets 4-H alumni

For the over 350,000 4-H alumni across the country, there's a new way to get back to their roots.

In September, **4-H Canada** launched **Club 1913** — an online hub for its alumni to reconnect with the organization and keep up-to-date on its activities.

Alumni register on the website and note when they were involved in the organization, says **Valerie Stone**, a Canadian 4-H Council director.

For alumni interested in giving back to their communities, 4-H is considering the creation of an online job board which would include volunteer postings, says **Elizabeth Jarvis**, marketing and communications director of 4-H Canada. Jarvis stresses alumni involvement doesn't have to be in the “traditional sense as a leader or (by serving on) a board.” Rather, alumni could mentor a current member or volunteer at a single event.

Alumni could also share opportunities with current 4-H members by posting internship and summer job opportunities.

To further develop communications with its alumni, 4-H Canada will publish an alumni magazine in the spring, says Jarvis.

To join the approximately 1,700 individuals who have registered on the online hub, visit Club1913.ca. The organization also encourages alumni to share on social media how their 4-H experiences have contributed to their longer-term successes, using #4HClub1913. **BF**



Oakozhan/iStock/Getty Images Plus photo

Russian grain complicates Canadian policy picture

Expanded Russian grain exports have some competitors reassessing the global grain outlook.

It's only one of many shifting factors that need careful consideration as Canada's federal, provincial and territorial governments plan for the next phase of national agricultural policy, **Al Mussell**, research lead of the Guelph-based consulting firm **Agri-Food Economic Systems**, said in a recent interview.

Numerous reports predict record exports from Black Sea ports because of bumper crops this year in Russia, Ukraine and Kazakhstan. A Sept. 12 **Australian Export Grain Innovation Centre** (AEGIC) report, for example, predicts Russian grain export growth

as high as 60 per cent by 2030.

Mussell said growing agricultural exports likely reflect depressed prices for Russia's traditional foreign exchange generator, petroleum. Russia's growing exports also highlight a shift in global trade that Canadian governments must consider while recalibrating national agricultural policy agreements set to expire in 2018.

Together with **Douglas Hedley** and **Bob Seguin**, Mussell outlined crucial policy points in a paper posted to Agri-Food Economic Systems' website in early September. Other issues include the future of supply management, food processing capacity and planning for either the

success or failure of proposed major trade agreements with Europe and Pacific Rim nations.

“Plan A is we've got TPP and we have the Canada Europe trade agreement; these (agreements) will drive growth . . . but if those two things don't happen . . . what's plan B?” Mussell said. **BF**



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Ontario's agri-food sector confronts its skilled labour shortage

For Ontario hop producers, like Kyle and Julie Wynette of Tavistock Hop Company, the explosion in craft breweries has provided an opportunity.

Nicholas Schaut, Big Head Hops photo



Opportunities for educated employees abound, but are enough qualified people available?

by JEFF CULP

The agri-food sector employs 2.2 million people or one in eight Canadian workers, according to Agriculture and Agri-Food Canada. The sector also plays a central role in Ontario, employing one in nine workers in the province, according to Statistics Canada. Indeed, the sector accounted for 5.9 per cent of Ontario's Gross Domestic Product in 2015.

But a labour shortage exists in the agri-food sector. This shortage affects primary producers (who account for only a small fraction of the sector), input and service suppliers, food and beverage processors, food retailers and wholesalers and food service providers.

At the national level, the labour gap in on-farm jobs alone in 2014 was 59,000, estimates the Canadian Agricultural Human Resource Council (CAHRC). (Together with the Conference Board of Canada, the CAHRC conducted a comprehensive survey in 2014. They interviewed stakeholder organizations and over 800 producers across the country. The research was released earlier this year at the 'Growing the AgriWorkforce Summit' in Winnipeg.)

Even when foreign temporary workers were available, the on-farm labour shortage remained critical, said Debra Hauer, project manager at CAHRC.

"We were able to determine that in 2014, there were 26,400 unfilled vacancies (after accounting for foreign temporary workers) which cost the industry about three per cent of farm receipts. That's about \$1.5 billion," Hauer said.

The unfilled vacancies are not unfilled seasonal harvest jobs. Indeed, Hauer says horticulture producers have less difficulty in filling harvest

jobs than other farmers have in filling skilled, permanent jobs.

"And that's on-farm employment only," she said. "We have not gone either upstream or downstream" in the agri-food supply chain.

Up and down the supply chain, the labour shortage may be even more acute. In 2011, the Ontario Agricultural College (OAC) in Guelph conducted a survey that indicated the existence of three jobs for every agriculture graduate.

"Anecdotally, we think those numbers stand up and may be more true today than they were then," said Rene Van Acker, the dean of OAC. The college is re-doing the survey to see if the results are still valid and aims to release the results in the spring.

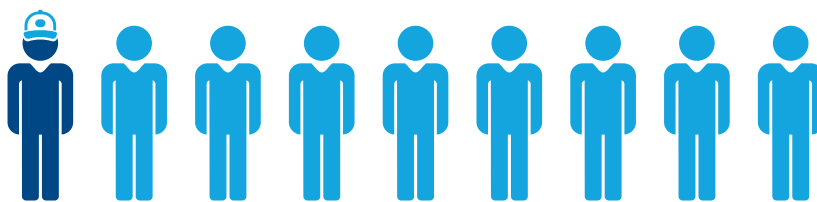
Some of the shortfall can be traced to young people shying away from the agri-food sector. "Campaign research (from Food and Beverage Ontario's

Taste Your Future campaign) suggests that there is low awareness of the size and scope of the sector which generates \$41 billion in revenue, provides over 130,000 direct jobs and exports \$7.6 billion in product annually," said *Fertile Ground: Growing the Competitiveness of Ontario's Agri-food Sector*. This report, released in October by the Ontario Chamber of Commerce, said the labour shortage threatens the competitiveness of the agri-food sector in Ontario and recommends that governments take measures to address this shortage.

"We were really shocked," said Kathryn Sullivan, the report's author. "Some of the figures are pretty overwhelming, especially in the primary agriculture sector."

There is also a widespread misconception that agri-food jobs are low-paying and don't allow for advancement, the report added.

But nothing could be further from



THE ONTARIO AGRICULTURE AND AGRI-FOOD SECTOR PROVIDED



EMPLOYING OVER 790,000 PEOPLE

Statistics Canada and OMAFRA, 2015

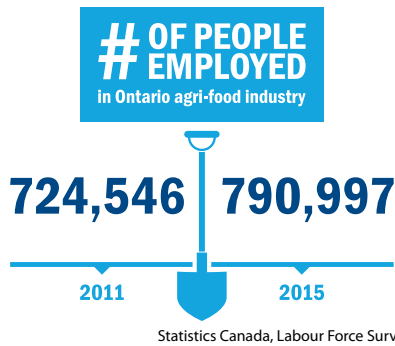
the truth, said Sarab Hans, the CEO of Hans Dairy in Mississauga. "When you are in agri-food, you have so many things from marketing to product development to taste analysis," she said. "There's just so much to do that it keeps it interesting."

Hans said her dairy, which employs approximately 20 people, has difficulty filling positions "all down the stream, from production staff to general labour."

"General labour in food is very different from general labour in other industries. Because there's such an emphasis on hygiene and food safety, there's a lot of training required," said Hans. "Sometimes it's easier to get the management-level people than (it is to get the) general labour on the floor."

Much of the increase in demand across the agri-food industry is a result of changes on the farm.

"Farms are getting larger," said the



CAHRC's Hauer. "So there's a greater demand for management and business skills to work on those farms. There's a need for business administration, marketing and HR management skills."

Hauer says the increasingly tech-driven nature of farming is also increasing the demand for skilled labour.

"Tractors are now a technology. You need someone to operate them, repair them, train other operators," she said.

There have also been changes in the marketplace. In 2010, the CAHRC developed a strategy document that identified three drivers inspiring innovation in Canadian agriculture that are leading to an increased demand for labour.

First, farms that specialize in high-value production chains are generating new employment. These farm operations appeal to specialized markets that may require higher quality and tracking standards.

"There is a producer in Alberta, for example, that produces crops used as ingredients for shampoos in Germany. To market to Europe requires a very high quality standard that requires an on-farm lab," Hauer said.

This level of quality assurance, requiring the presence of something as sophisticated as an on-farm lab, "is different than the traditional way of producing a crop and sending it off to market," said Hauer.

Continued on page 17

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The Centre For Food at Durham College's Whitby Campus integrates horticulture courses with culinary skills development and hospitality management.

Durham College photo

Training the next generation of agri-food workers

A recent report warns the federal and provincial governments about the labour shortage in Ontario's agri-food sector and provides policy recommendations to alleviate the problem.

The Ontario Chamber of Commerce (OCC) released *Fertile Ground: Growing the Competitiveness of Ontario's Agri-food Sector* in October. The 29-page report, written by Kathryn Sullivan, policy analyst at OCC, was sponsored by Maple Leaf Foods. Key among the report's recommendations is a new focus on agri-food education.

The OCC praises Ontario's education system for its flexibility in keeping its ag curriculum up to date, and the report notes that formal education in agriculture is highly in demand.

"Employers value the skills taught in agriculture courses," said Sullivan. "Sixty per cent of respondents (to the OCC's survey) showed a preference for post-secondary education when hiring. We also recognize that demand exceeds supply."

The report said modern agri-food education must provide graduates with "soft skills, including communication, teamwork, presentation, time management, and organization skills."

The newly opened Centre for Food at Durham College's Whitby campus emphasizes these skills and recognizes the integration of the agri-food supply chain.

"We created this school that we think is different from our competitors," said Sue Todd, Durham College's dean of science and engineering technology. "We wanted to look at all areas of food: growing it, preparing it, the health benefits of it and how to reduce the pollution aspects of it."

The Centre for Food actually started with culinary students. "Then we brought in hospitality management and then horticulture. All the students learn basic planting, soils, pest management (and) greenhouse management. They learn safe food-handling practices, food production, processing, and the storage and

testing of food," she said.

"This allows them (students) to appreciate the full cycle of it. They have an understanding of the whole chain of where and how food is grown, how we harvest it, how we store it and how we create added value to it."

Knowing all the basics is critical for students who, in a changing world, may end up doing a job that doesn't exist today.

"They have to know the fundamentals. You have to give them the raw science behind it," Todd said. "This gives them the foundation to be creative and pursue new product areas."

At the Ontario Agricultural College in Guelph, updating the curriculum is constant. "Keeping our current programs current is very important," said Rene Van Acker, the college's dean. "We've increasingly provided opportunities for travel and experiential learning."

Keeping the curriculum current means staying in touch with the agri-food industry.

"We work really closely with industry partners, greenhouse growers, nursery growers, food producers and food processors," said Todd. "We meet with them twice a year and talk about the latest trends: what's happening in the industry and new skills and technologies that are appearing. Then we'll look at that in light of our curriculum."

Both Durham College and the OAC have faculty members who have worked or are working in the industry. They also keep the curriculum current.

Both institutions have out-reach programs that seek to recruit new students to agri-food education, and both institutions see demographic changes in their student profiles.

OAC's Van Acker said urban-based students now form a majority of agriculture students, while Durham College's Todd said her students are older.

"The average age is closer to 30 than it is to 18," she said. "They've been in the workforce, found an interest in agri-food and come to us for formal education." **BF**

Continued from page 14

A second driver, according to the CAHRC, is energy-oriented production chains. These operations take advantage of bio fuels. They are typically dairy or feed lot operations that generate the raw materials used for bio gas and bio diesel. "These products never existed before," Hauer said.

Consumer trends are behind the CAHRC's third driver. "Custom-er-oriented businesses, where farmers have a close relationship with the consumer, are a new societal trend," said Hauer. "Market gardening, U-pick (and) farmers markets all address a need expressed by consumers . . . to know where their food is coming from. There are producers out there who are responding to those opportunities."

New opportunities

Responding to new consumer trends has created new operations, new products and new niche markets.

"Keeping an eye on consumer trends is the name of the game with niche crops," said Kyle Wynette of the Tavistock Hop Company in Perth County. Wynette, his wife Julie and another couple operate the thriving operation.

"Our farm has only about 30 workable acres. My wife and I were both working off-farm and were looking at something we could do with small acreage that had more potential than a traditional field crop. We had some friends who were home brewers, and they suggested we grow hops," said Wynette.

After five years of planning, marketing and production, Wynette expects the farm will start producing a "respectable income" this year.

For Ontario hop producers, the explosion in craft breweries has provided an opportunity. "In the past couple of years, something like 200 breweries have opened in Ontario," said Wynette. "There are about 80



About 200 new brewers have opened in Ontario in the past two years, creating demand for Ontario hops growers.

Kyle Wynette photo

acres of hops in the province. You get a lot of one-acre, half-acre operations." The Tavistock Hop Company's six acres is a respectable size.

The Wynettes' operation started with brand building.

"Social media was huge. Facebook and Twitter. We would follow craft breweries on Twitter before we approached them, and they see that."

Wynette now supplies small craft breweries and has a sizeable farm-gate business selling his organic hops



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to home brewers.

Even though new operations are addressing new markets, Nissim Avraham, who specializes in ethnic and innovative marketing for the Dairy Farmers of Ontario (DFO), said opportunities exist to increase the demand for Canada's traditional agricultural products. He sees new growth in the food-processing sector.

"From the first day I joined DFO nine years ago, I found the ethnic market is an opportunity, and that opens your eyes to opportunities in other places," he said.

Canada's strong and vibrant ethnic communities demand food products that are not traditionally found in North American markets.

"Paneer is a type of cheese eaten in India. Basically, it's the most important staple in Indian food," Avraham said. Canadian producers make about 600,000 kilograms of paneer per year "and that's not supplying half the market," he said.

"Plus there's a market for a million more kilos in Australia alone. I could send two containers of paneer to Australia a month, and I won't scratch the surface" of the market, he said.

Avraham is working with the Canadian Trade Commissioner Service to open up markets in the Middle East through trade shows in Dubai. Adding value to the food chain in Canada is part of continued growth in the sector.

Adding value is the key to future domestic demands as well, said Hans, whose dairy targets the Asian ethnic market in Canada. "The south Asian market consumes a lot of dairy, but they tend to use dairy to make food at home," she said. "Now they are having children, and a new market is emerging. The children want the same taste, but they are looking for food that is already made for them as a finished product."

The future need for labour

New export demands, changing consumer tastes and jobs that never existed before in the agri-food sector

all put pressure on the sector's future labour supply, said the CAHRC's Hauer.

"We've projected the labour numbers out 10 years, and the results are sobering," she said.

"We looked at the demographics in each province — how many 5-to-15-year-olds are there today who will become potential entrants into agriculture and agri-food in the future — and we think the shortfall will almost double in 10 years." The projected shortfall, according to the CAHRC, is 114,000 jobs.

Convincing young people that agri-food holds a bright career future must be part of meeting the jobs gap, she said. It's the council's challenge of the future.

"We are working with other organizations that have similar concerns, including the Ag(riculture) in the Classroom people and 4-H. We're trying to figure out how people in non-farming families would consider jobs in a variety of areas in agriculture," she said. "We don't have the answer, but it's more than just advertising."

The CAHRC has already undertaken the development of national occupational standards for agriculture. National occupational standards state the standards used in the workplace for various jobs and specify the skills



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To keep their curriculum current, the OAC encourages hands-on learning on farm sites.

that underpin the knowledge and understanding of the occupation.

"It's never been done for agriculture," Hauer said. "We are developing standards for about 40 roles. So now people will know what they have to know to become a livestock producer or an apple grower."

These standards should help educational institutions design training programs.

"With these standards, educational institutions can do curriculum mapping. They match their curriculum against the occupational standard to determine (the) gaps."

Keeping curriculum current is a constant challenge at OAC.

"We've increasingly provided opportunities for travel and experiential learning, and then there's the job of creating new programs," said Van Acker. "For example, we are in the midst of developing a program that concerns itself with food-industry management training."

"The good news for students is whatever their interest might be, they can probably find a place in the food and agriculture sector," he said.

To encourage more enrolment in agriculture programs, the OAC has set up a liaison program, funded by the University of Guelph's alumni and various agri-businesses.

"It works with high schools in Ontario to provide special learning

opportunities. It's a way to get them on campus, for one," he said. "They (the students) like the Guelph campus, and that plants the seed. We've been getting students from this program and our enrolments have been rising."

Van Acker also believes the biggest problem is getting the word out to young people who are looking at careers.

"Part of it is the invisibility of the agriculture sector. If they're not familiar with the field, they may think it's farming. They wouldn't know there's a very large sector supporting primary producers. Then there's the food side—that's an even bigger sector—but because it's so diversified, it's somewhat invisible as well."

He believes the college is getting the message out. "The majority of students enrolling in our core agricultural program, which is a Bachelor of Science in Agriculture, are from urban postal codes," he said. **BF**

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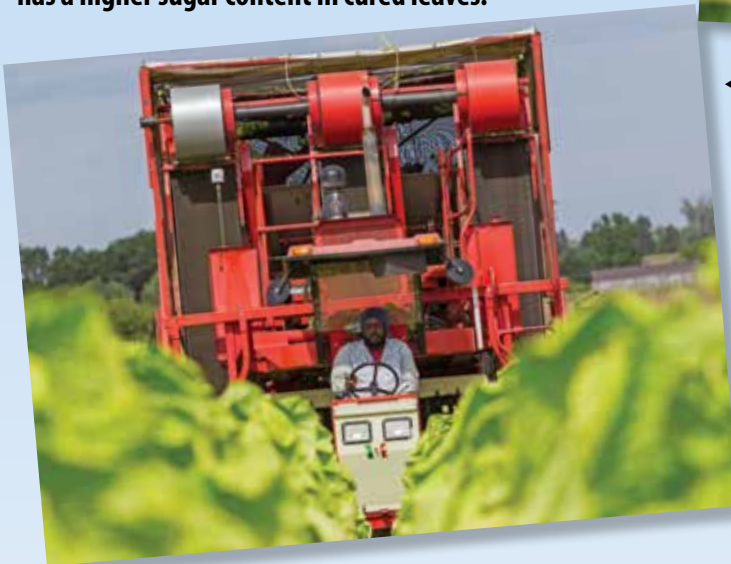
Canada

Specialty crop production in the sandy soils

For the Arvas, tobacco production is part of a family tradition. This crop remains a central component of the family's diverse operation.

by KYLE RODRIGUEZ

A stray tobacco flower stands tall above the surrounding plants in the mid-September sunshine after escaping the "topping" stage. Seedlings start out in greenhouse trays in mid-March, and are planted around May 24 after the last frost. When the flowering stage begins in July, workers walk amongst the rows and cut the flowering heads by hand. This "topping" stage encourages the plant to divert its energy away from reproduction. Instead, the plant directs its energy towards creating larger, more uniform leaves, and has increased root growth. Ultimately, the "topped" tobacco has a higher sugar content in cured leaves.



Spencer, who only gave his first name, drives a De Cloet tobacco harvester for the fourth and final pass, removing the final leaves from the field in mid-September. The first-pass harvest usually begins at the end of July or start of August and involves removing the lowest leaves. Subsequent stages of harvest move progressively higher up the plant. This approach allows the fourth-stage leaves to fully mature and acquire the strongest nicotine content. Where picking was once done by hand and loaded into a horse-drawn sled, this harvester has modular attachments to automate the pulling of leaves from specific levels without damaging the plant.

Tobacco growing has a long-standing history in Ontario. According to the *Canadian Encyclopedia*, native peoples in south-western Ontario grew tobacco and used it for trade.

In the early 1800s, producers started cultivating the crop commercially in Canada. By about the 1920s, producers made the switch to the flue-cured tobacco – which is the type of tobacco still grown today.

In 1939, Hungarian immigrant Joseph Arva bought a parcel of land in Mount Pleasant, Brant County, and began farming tobacco. His son, Emil, took over the business and expanded it. By the early 1980s Emil's sons, Paul and Joe, were working alongside him learning the trade.

Emil passed away eight years ago, but his sons carry on the tradition of growing quality tobacco leaves for Canadian consumption. Today, the

Arvas farm a total of 800 acres, including approximately 200 acres of tobacco and 42 acres of ginseng, along with rye and soybeans.

The operation also has a chicken barn.

While tobacco farming technologies have come a long way since the family first started cultivating the crop, old fashioned values like teamwork and hard work are still crucial at harvest time. **BF**



◀ Phil Edmund takes a break while waiting for an empty curing bin to be delivered to the harvester in the field. Edmund is part of a two-man harvester crew, working with a driver. Edmund's job is to stand on an upper level and direct cut leaves so they evenly fill the bin as the harvester drives along the rows.

▶ Terry Leatham (left) and Carlos Run place separating pins into a curing bin full of freshly picked tobacco brought back from the harvester. These separating pins promote airflow and prevent spoilage by keeping leaves separated when the bin is tilted vertically for loading into the kiln.



◀ The curing bin of fresh tobacco is then slid up a short ramp and into a kiln where it will rest for thirteen days. Curing starts at 32 C and final drying temperatures reach 66 C.



▶ Omar Sosa-Castillo (left) and his brother Alejandro remove a bin of cured and dried yellow leaves in preparation for sorting and baling.



From left, Jose Juarez-Sarza, Omar Sosa-Castillo, Salome Sosa-Ferrusquia, and Alejandro Sosa-Castillo pull separating pins before removing the tobacco from the curing bin. ➤



Handfuls of dried leaves are tossed into sorting bins by a group of workers while one individual stands on top, guiding the leaves in and stamping them down to compress. ▼



◀ Karen Bradley does the final stage of grading and sorting second-pass tobacco leaves before they make their way up a ramp into the baling machine. She quickly but carefully picks out green or undesirable tobacco as leaves steadily pass by.



◀ Paul Arva (left) meets with ginseng cultivation consultant, Tony Quon, outside the sorting barn. Quon provides field recommendations to help with the development of the 42 acres of ginseng that the Arvas cultivate. The plant is very sensitive to growing conditions, and agricultural techniques that produce better grades are proprietary amongst competitive farmers. Arva says that alternate crops such as ginseng, as well as his chicken barn, help cushion his operation from changes in the tobacco market.



After the field and before the lake

Effort to recoup phosphorus runoff faces hurdles and unknowns but could deliver cost savings to farmers while protecting open waters, say organizers.

by MARY BAXTER

Little did Larry Van Severen know when he was growing up on the family's tobacco farm near Langton, Norfolk County that his enjoyment of a neighbour's swamp would one day help inspire an ambitious effort to protect a much larger body of water.

Back then, Van Severen enjoyed the swamp for its unending supply of frogs and snakes and opportunities to muck around.

The neighbour, however, didn't share Van Severen's affection for the spot and in the 1960s filled in the area. A municipal drain soon followed to serve about 600 acres; it travelled through the back part of the Van Severen family farm.

In the early 2000s, Van Severen applied for a grant under a now-defunct water-supply enhancement program to transform a two-acre area through which the drain ran on his farm into wetland.

"We took a 24-inch underground drainage pipe, brought it above ground and created — with motor scrapers and draglines and stuff like that — a diverse depth of water. We put a little island in the middle and shallow areas and deep areas," says the now-retired farmer who is in his late 60s. The project cost more than \$30,000 (two-thirds of which came from his own pocket, he says). He and his wife, Dolores, planted bulrushes, lilies and other native plants to filter the water.

Today, the frogs have returned.

So, too, have county drainage staff to occasionally grab water samples from the municipal drain both up and downstream.

The drainage staff discovered in the samples at Van Severen's wetland and at another restored wetland that phosphorus and nitrate levels were lower downstream. The findings could point to a way to employ such projects,

and perhaps even municipal drains themselves, to prevent dissolved phosphorus in field runoff from reaching Lake Erie.

The wetlands are among 30 projects of different scales that the county has helped to introduce since the mid-1980s, says Bill Mayes, Norfolk's senior drainage superintendent. (The projects started as a way to protect source water in the municipality.)

"Within the wetland there is uptake of the phosphorus and nitrate," Mayes says. "How much, everybody argues. 'Oh you're not getting the sample at the right time.' But when you see two numbers side by side, and they're different, there's obviously something happening."

Provincial ministries tell the municipality that the numbers are not overly significant. Nevertheless, Mayes says the county is now seeking partnerships to explore doing more in-depth study.

In the meantime, the county's findings add fuel to a one-of-a-kind partnership between two other organiza-



Water is being pumped from a municipal drain into a canal in Wallaceburg that feeds into Lake St. Clair.

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tions that seek to manage runoff after it has left the farm field but before the runoff empties into a main water-course.

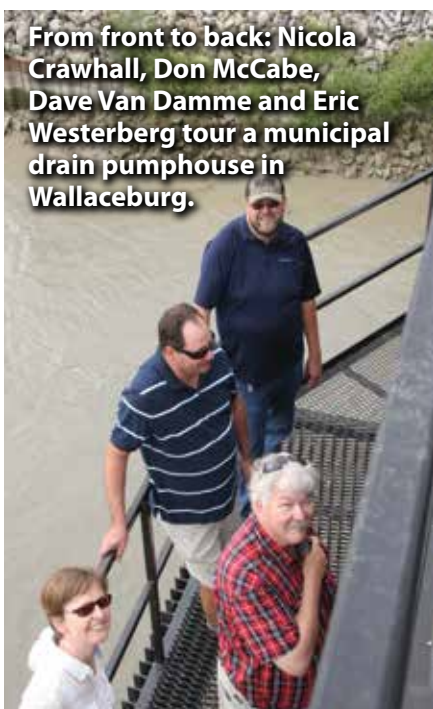
The Ontario Federation of Agriculture (OFA) and the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) announced the joint partnership earlier this year. The groups aim to address the beyond-the-field problem in the upper and lower Thames River watersheds.

In 2015, the international Lake Erie Binational Nutrient Management Strategy report identified the entire Thames River watershed as one of the key Canadian sources of dissolved phosphorus that may be affecting water quality in the Lake Erie basin.

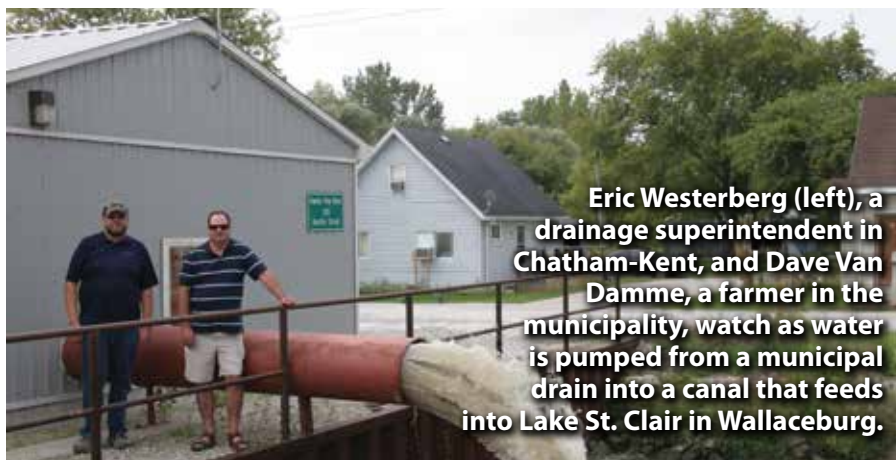
Since the report's release, governments and industry on both sides of the lake have introduced a dizzying array of incentive programs, regulations and best-management practices for agriculture to help reduce phosphorus loss.

None, however, tackle that in-between zone when runoff leaves the farm but has not yet entered the watershed, says Don McCabe, the OFA's president.

"The OFA saw a hole in the quilt to



From front to back: Nicola Crawhall, Don McCabe, Dave Van Damme and Eric Westerberg tour a municipal drain pumphouse in Wallaceburg.



Eric Westerberg (left), a drainage superintendent in Chatham-Kent, and Dave Van Damme, a farmer in the municipality, watch as water is pumped from a municipal drain into a canal that feeds into Lake St. Clair in Wallaceburg.

ensure one landscape," McCabe says, and decided to step in.

Nicola Crawhall, the GLSLCI's deputy director, says the two groups approved the partnership and strategy to close the gap in June after months of consultation with farm groups, non-government organizations, drainage professionals, municipalities, First Nations and conservation authorities.

The partnership has applied for funding from the provincial and federal Growing Forward 2 program to pursue the farmland water-management and drainage strategy and its implementation.

"We do expect to receive the funding," says Crawhall. If the two partners don't, they will delay the project until they obtain funding from another source. "We have a number of poker chips in the fire."

The partners envision a five-year program to determine and test practical methods to capture phosphorus lost from farm fields. "But there's a lot of front-end work before we go out into the field" and work with farmers and municipalities on projects, Crawhall says.

Having no single go-to source involved in managing beyond-the-field runoff complicates the effort, adds Crawhall.

"There were all these experts, extension workers and certified crop advisors who are excellent at the application and retention side of things, and there were all these drainage professionals who are excellent at the drainage side of things," she says. "We (GLSLCI and the federation) are bridging the two

(groups of experts)."

The effort complements others that focus more on the application and retention of phosphorus. The industry and provincial government's 4-R strategy to conserve fertilizer and nutrients, for example, will involve pilots this fall, and Crawhall anticipates the Ontario Ministry of Agriculture, Food and Rural Affairs' soil health strategy will be released in coming months.

Crawhall explains that the beyond-the-field strategy is needed because farmers, despite their best efforts not to, can still lose phosphorus from their fields. Research shows extreme weather as a main culprit in phosphorus loss from farm fields, she says.

She lists ways to not only slow field runoff's progression to open water-courses, but also harvest phosphorus from water so phosphorus can be returned to the fields from which it came. That's where wetlands, such as the one installed on the Van Severen farm, come in.

Vegetated wetlands pull up the phosphorus, she explains. Harvesting that vegetation before it dies reduces the risk of phosphorus release.

"You could even vegetate ditches . . . And harvest the vegetation from the ditches and keep the water in the ditches for a bit longer," she says. "Or you could do treatment technologies right at the outlet for the tile drainage system."

The first step, though, involves determining what works best in different types of soil and climate.

The biggest challenges the strategy's organizers face are how to coordinate the many different

jurisdictions involved and establish an approach that can work within different laws.

“It’s not just the drainage legislation (administered by Ontario’s agriculture ministry). It’s the Fisheries Act (administered by the federal Department of Fisheries and Oceans), and it’s the Endangered Species Act (administered by Ontario’s Ministry of Natural Resources and Forestry),” Crawhall says.

The program would be voluntary. “There’s no desire on our side to compel people,” she says.

For those who want to participate, the strategy’s organizers would provide expertise and coordinate funding for a system’s initial costs. However, the system would have to be self-sustaining afterward, and those using it would be expected to contribute to maintenance, she says.

Asked why farmers may consider participating, especially when

commodity prices are less than stellar, McCabe says market pressures make such an approach even more important.

“We will have an opportunity, if we are able, to capture this phosphorus,” he says. “We can bring it back to the farm again for use.

“It means closing the gap on any kind of loss to your inputs and having opportunities to access those inputs in a cheaper manner. That’s what this project is about.”

To be viable, the venture must be profitable for the farmer, he adds. “With profitability comes environmental protection.”

Back in Norfolk County, Van Severen expresses skepticism.

“I believe these projects are very, very good, but they (the organizers) have to start by getting the farmers’ trust back,” he says. Laws such as Endangered Species have created a lot of worry in his community about the

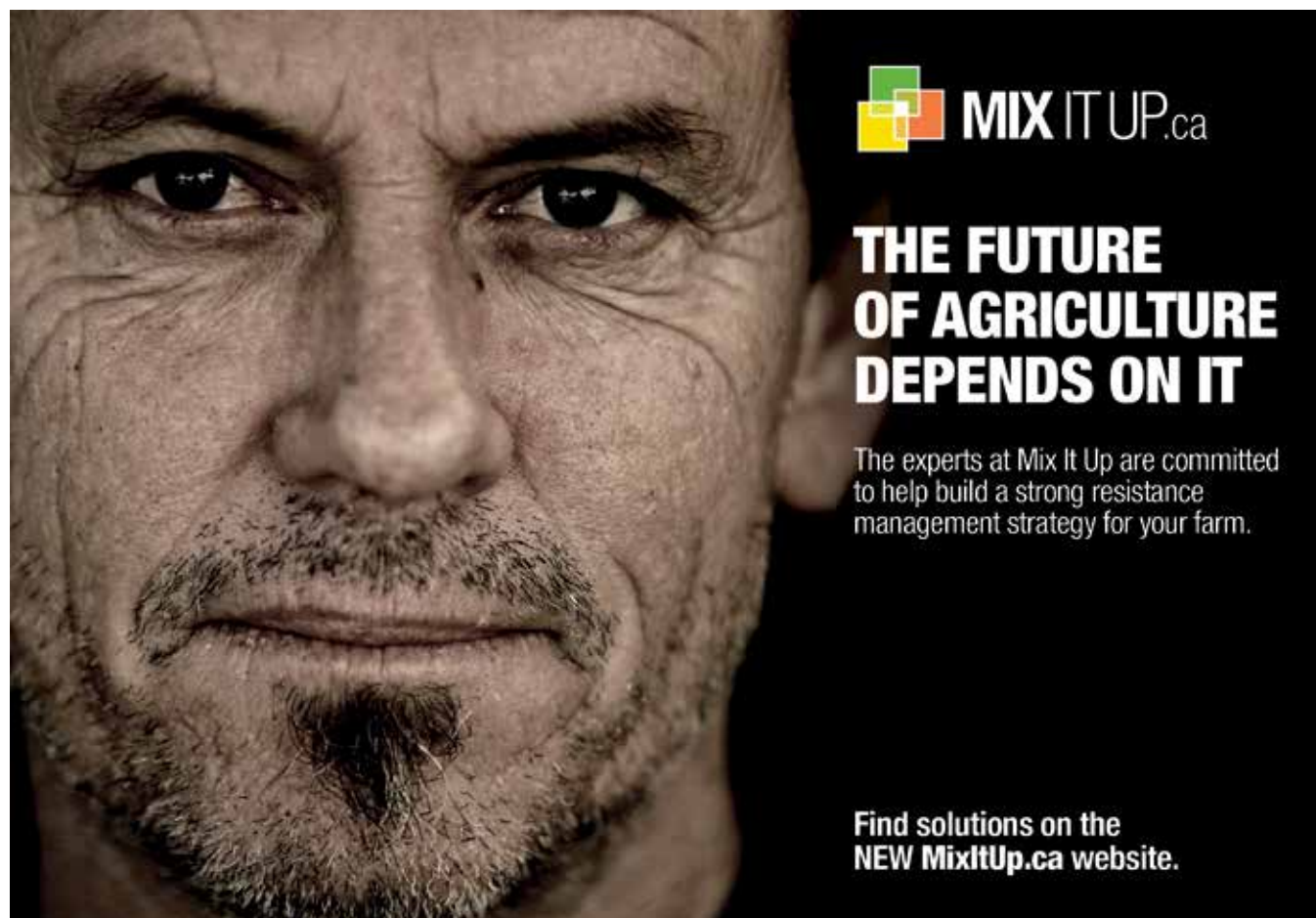
possible negative effects of conservation on farm operations if the effort attracts an endangered species.

Van Severen says he wouldn’t consider adding a wetland to his property today. Red tape and regulations that compel instead of educate landowners to adopt environmentally friendly practices are “too scary (for) farmers.”

“(Government) attitudes have to change” to attract buy-in on a project of this type, he says. And society needs to pay its fair share.

McCabe acknowledges that farmers’ relations with conservation and drainage authorities become adversarial all too often. To manage off-farm runoff, collaboration is essential, he says.

“The reality is we’re all in this system together. So now let’s close the gaps and the goals together to make sure we all understand this is one landscape, and it has to work.” **BF**



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After 30 years of operation, the drain had doubled in width, says Eric Westerberg, one of the municipality's drainage superintendents.

To address the problem, they opted to create a two-staged ditch. The design introduces benching — a wider area two-to-three feet above the drain's bottom — to accommodate greater volumes of water and reduce its velocity.

They also added another pump that could drain deeper water.

The municipality maintains more than 250 municipal pumping schemes in areas where the land is




This municipal drain was recently changed into a two-staged ditch to address erosion along its banks.

below lake water levels.

Westerberg says the changes mean greater control over ditch water levels. "You're not bringing the water up into the dirt and pulling it down fast, so we could try to stay ahead of everything." **BF**

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Farm dogs

Are they livestock or part of the household? Maybe it's a bit of both.

by JIM ALGIE

In punishing August heat, Kevan Gretton and his sheep hosted 80 top dogs and their handlers this year at the Canadian Border Collie Association's National Sheep Dog Trials on his Shepherd's Crook Farm near Woodville, east of Toronto. The day was hot and dry after more than four weeks without much rain, and the fields were hard baked.

There came a point on the first day of competition when organizers considered a pause. Dog tongues dangled. Everybody was hot. But event organizers proceeded, periodically consulting judges and owners about the condition of both sheep and dogs.

They worked carefully through the weekend, pausing only two days later when torrential rain and tornado warnings finally spelled the end of drought in this part of Ontario.

Holding the trials under such conditions puts everybody at risk, said Gretton during a mid-day interview when temperatures that he described as "really brutal" hovered in the plus-30 C degree range. Gretton, who markets lambs from his 300-ewe, 200-acre operation, had long since moved his lambs indoors to begin feeding them hay.

Good husbandry requires care and attention to the needs of livestock, and that goes double for the farm dogs who uniquely serve as farmers' workers and companions.

Gretton has worked with border collies throughout his 30 years at Shepherd's Crook; he worked with them even earlier when he was a child in England. The dogs play the role of the "hired man," he said. His three working dogs live in kennels along one wall of his drive shed, and he enters them in international competitions.

"I had an accident when I was



Kevan Gretton and his dog, Clint. Gretton hosted this year's National Sheep Dog Trials at his Shepherd's Crook Farm near Woodville, in Kwartha Lakes, in August.

younger. I can't run. He (one of the dogs) will do the running for me," Gretton said of his canine help.

"I use a dog, not necessarily every day. But he gets used quite a bit, moving sheep, putting them through the chute, as you would a second person."

Gretton's dog Sid won 153 points and placed 10th in double lift finals at this year's nationals. Sid came well behind a dog named Dorey who took the competition with 257 points. Dorey belongs to Amanda Milliken of Kingston.

Gretton enjoys trials which mimic daily field work. They test the herding skills of individual animals and the communication between him and his

dogs. Beyond their practical value, trials also provide opportunities for travel and socializing.

"We spend February in Florida, competing (there)," Gretton said. "It's a good holiday and good reason to go."

Teresa Castonguay's interest in herding dogs led her to sheep. Castonguay, an arts administrator who has a small flock of 40 sheep near Warkworth, became interested in border collies while she was driving in England and saw them working sheep on rural roads.

"I lived in Toronto, so I got a border collie and said, 'Oh, this dog needs something to do,'" she explained in an interview. She described



Teresa Castonguay is a director of the Ontario Border Collie Club. She is also a shepherd and owner of both border collies and Maremma guardian dogs on her farm near Warkworth.

how she has been juggling employment as an administrator and the farm for the past 10 years.

Castonguay and some dog-owning friends purchased sheep and first rented space on the outskirts of Toronto where they could work the animals.

"Then I said, 'Right . . . I'm going to have to come and live in the country.'"

Two dogs — Ross, nine years of age, and Deacon, three — both herd, although Ross is beginning to show his age, and Deacon still needs some

training. When the work ends, both animals move in with their owner.

"My dogs come out with me; they work the sheep. But when they come home, they actually come in the house and they lie around and look at me like 'Why are we just lying here? Why aren't we doing something?'"

Castonguay also has two Maremmas to guard sheep against coyotes. These dogs, bred and born in the barn, have no household privileges.

"I have to be able to handle them so I can give them their shots or clip their nails or whatever, but they're not

pets," she said. "I try not to relate to them as pets."

For farm dogs, the distinction between working animals and personal pets can be fine. The late James Herriot, once a Yorkshire veterinarian and author of *All Creatures Great and Small*, wrote about the theme in a short story about a working dog named Gyp.

"I still stick to my theory: most farm dogs are pets and they are there mainly because the farmer just likes to have them around," Herriot wrote. He described the idyllic life of a farm dog.

"They don't have to beg for walks, they are out all day long, and in the company of their master," he said. "If I want to find a man on a farm I look for his dog, knowing the man won't be far away."

Carolyn Muir Helfenstein, a retired Teeswater-area dairy farmer and former weekly newspaper publisher, believes dogs on a farm draw together all its elements: land, livestock, wildlife and humans. "Our Farm Dog," her autobiographical story about a long-gone-but-not-for-gotten Australian shepherd called Bruce, appeared in *Our Family Farm: Stories from Bruce & Grey*. The book commemorates the International Year of Family Farming.



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On the Helfenstein farm, Bruce's herding instincts helped Carolyn's husband, Harry, with daily cattle movements. The barn-dwelling herder, a gift to Harry from Carolyn and her now adult children, relished his round-up chores, gathering cows and moving them under Harry's direction. Bruce also chased and killed ground-hogs, preferred to avoid muddy fields, played football with visitors and hated thunder and lightning.

One spring morning many years

ago when the children were still young, Bruce nearly drowned when he fell through ice on a nearby creek. Neighbourhood children watched anxiously from a waiting school bus until Harry managed to reach Bruce with a length of extension ladder and bring him to safety.

"Bruce knew that Harry and the two of them were a real team, but the kids knew him as somebody who would sneak into the house and watch television" with them, Carolyn said in

an interview from her home near Ripley.

"In our house, there were supposed to be no dogs, which was a joke because they'd sneak in anyway," she said.

"Almost every farm has a dog, and every dog has its own personality and the stories that go with it," Helfenstein said. "He's not always a purebred anything. He's often a pup that somebody else has got to find a home for," she said. **BF**



Kevan Gretton and his dog, Clint, crossing a field at this year's sheep dog trials.

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Protect your dogs from on-farm hazards

Vehicles and poisons pose the most common health hazards for dogs on Ontario farms, said Justine Rudniski in a recent phone interview from her office in Mitchell.

Rudniski is a veterinarian and the author of "Farm Dog Hazards" which appears on the website of Mitchell Veterinary Services.

Unneutered dogs may wander in search of mates or to defend territory. Dogs with herding instincts may attempt to herd vehicles in dangerous ways.

The use of restraints (such as fencing) that keep animals at home can help prevent them from colliding with vehicles and suffering injury or death, she said.

Farmer education about the poison hazards for dogs—notably slow-release, coccidiostat boluses used to prevent illness in dairy cattle

— can also help avoid problems.

"These long-acting boluses are meant to be in a cow's stomach," Rudniski said. "If she (the cow) brings one of those up and the dog thinks it's a toy (and) chews on that, those are invariably fatal," she said. "It's not something the dog should ever be able to get a hold of."

The presence of poison for controlling rats and other rodents also represent a farm hazard. Commonly used warfarin poisons are treatable and the effects typically "can be reversed in a few days," Rudniski said. But newer, long-acting poisons can remain active for as long as a month and are more difficult to treat.

Rudniski recommended that dogs be kept from riding in the bed of a moving truck or on all-terrain vehicles, as injuries can result if they

decide to jump out.

Farm dogs who spend much of their time outdoors need shelter from extreme weather, both cold and heat.

In summer, older animals or some breeds — such as huskies with double fur coats — may need grooming to prevent heat stroke. Access to a kiddie pool of cool water can help, Rudniski said.

Most of the dogs she sees are highly valued by farm owners who are willing to underwrite costly treatments to cure serious illnesses or injuries.

"That pet is there to play an important role as that person's companion, day in and day out, upwards of 12 hours a day. So, absolutely, it's a special connection," said Rudniski of dogs and their farm owners. **BF**

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Farming from scratch

Vince and Heather Stutzki have learned that a passion for the business is crucial for surviving agriculture's inevitable ups and downs.

by MARY BAXTER

Twenty-eight years ago, Vince and Heather Stutzki walked into a bank and asked for a loan to buy a hilly 200-acre farm south of Paisley in Bruce County. The couple had met at the University of Guelph where Vince studied agriculture ("I was a cropper," he says) and Heather focused on geography and environmental studies. Neither came from farm backgrounds. Vince hailed from Montreal and Heather from Mississauga.

Ever since he was five and his family vacationed in Vermont on

dairy farms, Vince had set his sights on farming. When they approached the bank, "we had no equipment, we had no experience; we had a lot of ambition," says Vince. They left with a loan at 16 per cent interest.

They began with crop production; Vince worked off-farm as a builder. In the second year towards winter, someone asked to winter sheep in the couple's empty barn. "The next thing you know, 10 sheep and a ram show up," says Vince.

Today, the flock numbers 900

ewes and the Stutzkis implement five lambing periods a year. They're busy. "To put it in a cropper's perspective," says Vince, "it would be when you pull out your corn planter to plant your corn, you're also pulling your combine out to combine corn; you're also pulling the sprayer out to spray your corn. All in different fields; all at the same time."

Large flocks are scarce in Ontario; the Stutzkis suspect the complexity of such an operation and the work involved discourage others from



Heather and Vince Stutzki

scaling up. Ontario's average flock size is 60 ewes, Vince estimates.

Since the mid-2000s, the sheep have also shaped how the family approaches its crop rotation. Earlier this year, the couple won the title Innovative Farmer of the Year from the Innovative Farmers of Ontario. They won partly for their use of what the pair terms "sandwich" crops (cover crops) as a way to provide animals with feed that is mostly harvested wet but on occasion and under appropriate conditions, harvested as dry feed or even grazed as pasture.

The couple grows soybeans, hay and silage corn, and in between these crops others, such as mixed grain (including fall rye and winter barley), oats, peas and tillage radish. Many of these crops are bagged for storage and then fed back to the sheep in a total mixed ration system. The Stutzkis

'The opportunity lies in managing your costs and it's all about being as efficient as possible.'

have divided 36 acres of permanent pasture into nine main paddocks. Each of these in turn is subdivided.

Every year the couple breaks up three to four acres of a paddock and then works that area for two years to control weed and pest pressure and maintain pasture health. They introduce temporary crops on which the animals can graze (or in the second year can be harvested for feed), such as corn, Sorghum-Sudan

grass, oats and peas. The Stutzkis then seed the area once more for pasture.

"It's all about managing costs," says Vince. "The opportunity lies in managing your costs and it's all about being as efficient as possible."

Now in their 50s, Vince and Heather recognize the next generation faces far greater hurdles to break into farming than they did. In recent years, their two older sons (they have four children: three sons and a daughter) bought a small farm nearby. The two generations help each other out.

The family has also embarked on developing a succession plan, and one of the key elements the parents expect their children to bring to the table is passion.

"If you don't have the passion, the business won't follow," Vince says. Farming, as he points out, is one of the only industries prepared to accept all the risk without knowing what — and if — a rate of return will follow the investment. "Your commitment has to be so strong."

Describe your role on the farm operation?

VINCE: Heather manages the flock through record keeping and logistics and I'm in charge of enacting on those logistics, making sure those logistics follow through. Heather is actively involved (as well) in the physical aspect of things. (Heather also works part time as an education assistant at a local school.)

On the cropping end of things, that's my responsibility, along with my sons. That role is now shifting into the next generation. It's not me deciding anymore; it becomes a group decision because they have their own farm that they're trying to manage. So, we try to work together on the decision-making process so that the rotation works for all of us.

How many people does your farm employ?

VINCE: Just myself and Heather.

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Hours you work per week?

VINCE: 100 hours (each) a week.

How many emails do you receive per day?

VINCE: 20.

Hours a day on a cell phone?

VINCE: Sometimes it's two hours.

What about your smartphone?

HEATHER: It's a great communication tool. I use mine for everything. Emails and texting, etc.

VINCE: I probably use the flashlight more than I do actually the phone for what it was designed to do (communication). You can capture data; you can record data. We used to always run with a calculator in our pockets; now we have everything in one tool that allows us to do multiple things in a very short period of time.

HEATHER: The only thing it doesn't do is radio tags.

Any favourite apps?

VINCE: Weather Network.

HEATHER: Instagram.

Hours a day on the Internet?

VINCE: Probably no more than an hour to two hours at the max. It all depends on if we're trying to research a project or whether or not we're just quickly checking emails or checking the weather or —

HEATHER: CBC, actually CBC is probably, just to keep up to date on —

VINCE: On what's going on nationally, locally. I think we have a responsibility to keep ourselves up to speed with what's happening in the world somewhat.

How often do you travel?

HEATHER: Once every five years.

VINCE: We went to New Zealand this spring. And that for us was a dream come true. Being in the sheep industry, what better place to go to than the country that invented sheep production on a large scale from an efficiency point of view?

Number of hours in the office each day?

VINCE: Not enough.

HEATHER: It's the same, not enough. I do the book-keeping; don't get in there very often.

What do you like best about farming?

VINCE: Being able to manage your own time.

What do you like least?

VINCE: Time is our enemy.

HEATHER: We don't have enough time to get everything done (as well as we'd like).

What is the single most important advice you've received or lesson you've learned?

VINCE: Not to be afraid to admit that you've made a mistake or that something just isn't going to work out. We're good at that. Everything we've learned here is through mistakes.

HEATHER: Trial and error.

What's your observation about farm succession?

VINCE: We are in the early stages of that conversation. It is agriculture's biggest challenge. And we need to start this conversation always sooner rather than later. There is a time when it's too soon, such as placing expectations on the next generation that they don't have the ability to understand or the ability to be able to manage. There's a time when the conversation needs to happen but there's also a time when it shouldn't happen —

HEATHER: Or to put the pressure on them that they have to, have to farm.

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What are your hobbies or recreational activities?

VINCE: Woodworking. I haven't had much time lately.

HEATHER: Photography, but I don't have much time for that too.

What was the last book you read?

HEATHER: I'm still reading Clara Hughes's *Open Heart, Open Mind*. I don't have much time to read, though.

VINCE: We get a magazine from New Zealand called *Country-Wide*, and I read that from front to back. So we read a lot of periodicals.

What does your family think of farming?

VINCE: They love it. They are just as passionate about it as we are about it.

What's your management philosophy?

VINCE: We're not afraid to try new ideas.

What's your most important goal?

VINCE: To raise the profile of agriculture so that the next generation can see the opportunity.

How do you define success?

VINCE: When the goal has been attained, and we believe that takes a lifetime.

Is your farm vehicle messy or neat?

HEATHER: Messy.

VINCE: Yep.

HEATHER: It's not my farm vehicle. My car is neat.

What are three items in your farm vehicle?

VINCE: A tape measure, a little steel ruler that allows you to dig the ground up and just see how far the seeds are placed apart and how deep they've been planted. And then there's always a coffee cup.

What are three items that are on top of your desk?

VINCE: Computer, calculator.

HEATHER: Stapler.

VINCE: File folders, usually.

What was the last piece of equipment you bought for your shop?

VINCE: A bead blaster.

What's the best time of day?

VINCE: Morning.

HEATHER: Morning.

What was your most memorable crop or production year?

VINCE: Last year was an exceptional crop year for us.

HEATHER: The year the sheep got killed (11 years ago).

VINCE: Dogs got in and chased a bunch of sheep around and killed a whole pile of them. It was a mess. **BF**



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Are we past the strong headwinds in the beef industry?

Having survived the downside on cattle prices, we may be headed towards an upward move — but it may take some time.

by MOE AGOSTINO and ABHINESH GOPAL

Wild swings have been the norm in the beef industry over the last 10 years, as it was forced to adjust to severe economic shocks, such as multiyear droughts, surging feed prices, etc. Per capita beef demand is acutely related to the health of the economy. Owing to a 12-year trend of declining cattle herd size in North America, beef prices started rising — but this situation came to a tipping point in 2014-2015.

Since then, U.S. cattle inventory rose, from 29 million head in 2014 to over 31 million head projected for 2017. U.S. beef production is projected to top 26 billion pounds in 2017, up from just less than 24 billion pounds in 2014.

But as cattle operators responded by increasing herd size, they found that the feedlot/slaughter industry had already downsized and, as a result, the price for cattle dropped. Reports of feedlot liquidations and bankruptcies have been in the news

recently, highlighting that the industry has quickly switched from expansion mode to liquidation mode. The United States Department of Agriculture's (USDA's) September 2016 Cattle on Feed report showed that the number of U.S. cattle on feed (on feedlots with a capacity of 1,000 head or greater) at the start of September was 10.1 million head. This total is a one per cent increase over last year. This year's calf and yearling prices are well short of 2015.

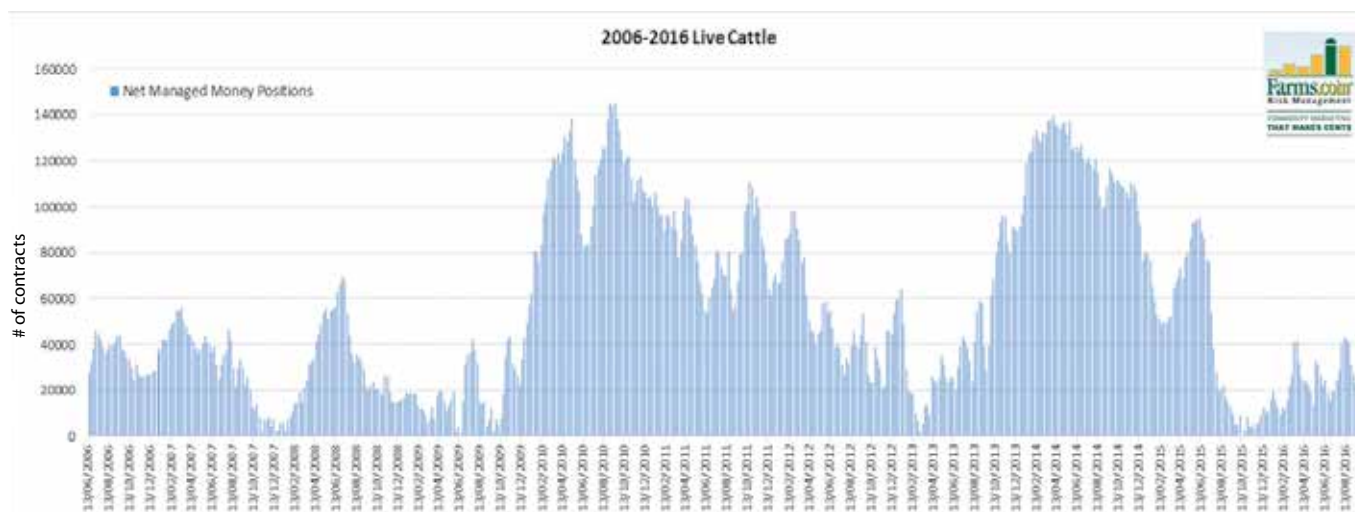
Every semi-trailer load of calves is worth roughly \$30,000 less than at the same time last year. Despite sharply lower feed costs, projected cattle operators' break even prices continue to decline. Lower cattle and feed prices are also causing some cattle feeders to add more weight and look for better pricing opportunities.

Though cattle producers are getting less for beef, retail prices are not dropping accordingly. Indeed, retail prices are expected to remain

high. Foodservice demand, which over the years has become an increasingly critical driver for the meat industry, has been weakening. The Restaurant Performance Index has been steadily declining since its peak in 2014. The customer traffic index decline has outpaced the broader index. The number of customers walking through the door of American restaurants is lower than a year ago.

The beef supply glut has caused managed money funds (speculators) to stay on the sidelines. Compared to early June 2015, net buy positions in feeder cattle at the Chicago commodities exchange have dropped by 13,864 contracts and are in negative territory now. On live cattle, the reduction in length has been by 71,626 contracts for the same time period.

Finally some good news for cattle producers and the North American beef industry, as China's Ministry of



Note: the contracts are of 40,000 pounds each.

Source: U.S. Commodity Futures Trading Commission and Farms.com Risk Management

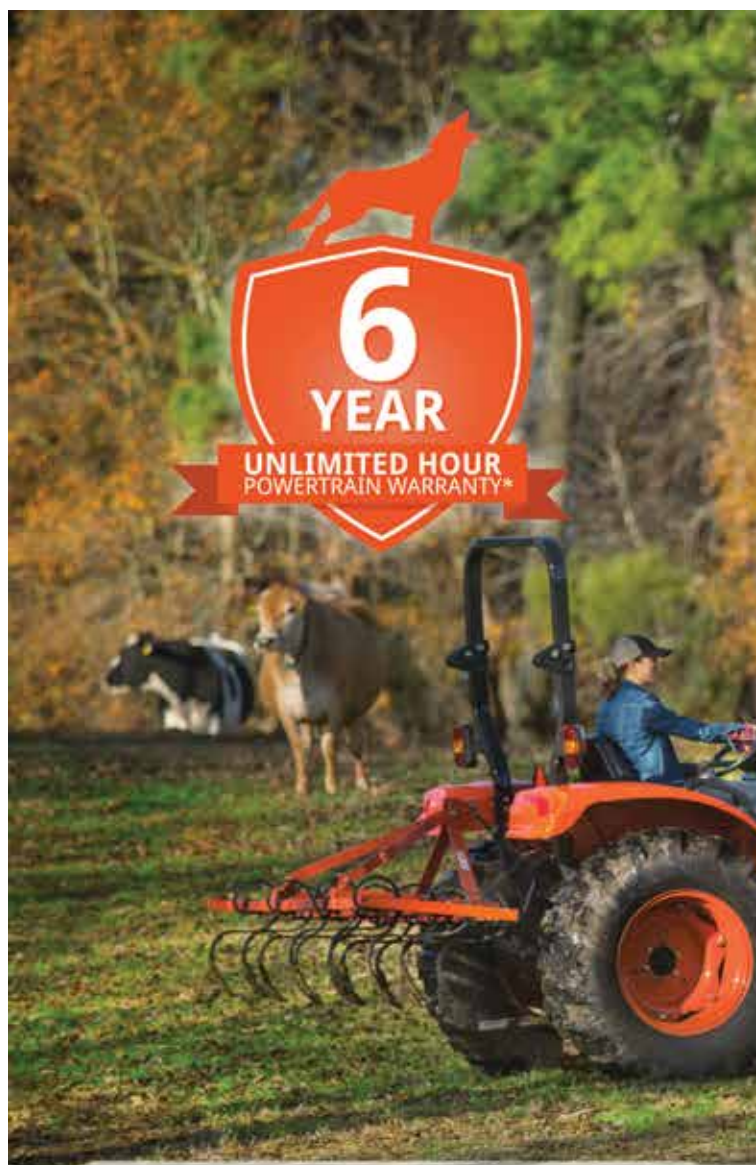


Having survived the downside on cattle prices, we may be headed towards an upward move in the cyclical beef industry.

SteveOehlenschlaeger/iStock/Getty Images Plus photo

Agriculture announced that the country's ban (since 2003) on imports of U.S. and Canadian beef has been lifted. China, being potentially the largest market for beef in the world, could be a source of strong export demand long-term. For January through July of 2016, total U.S. beef export volume was up four per cent to 640,888 tons, while value fell 10 per cent to US\$3.44 billion. Japan and South Korea continued to be top performers during this period. Exports accounted for 13 per cent of total U.S. beef production, but export value per head of fed slaughter was \$251.82 for January through July, down 13 per cent over the first seven months of 2015.

Looking at the spring and early summer North American cattle placements, a lot of cattle would be put directly into the late summer finishing period. After seeing those high numbers of slaughters in the late summer and early fall, weekly slaughter numbers were reduced in late September and contributed to a decrease in beef supply



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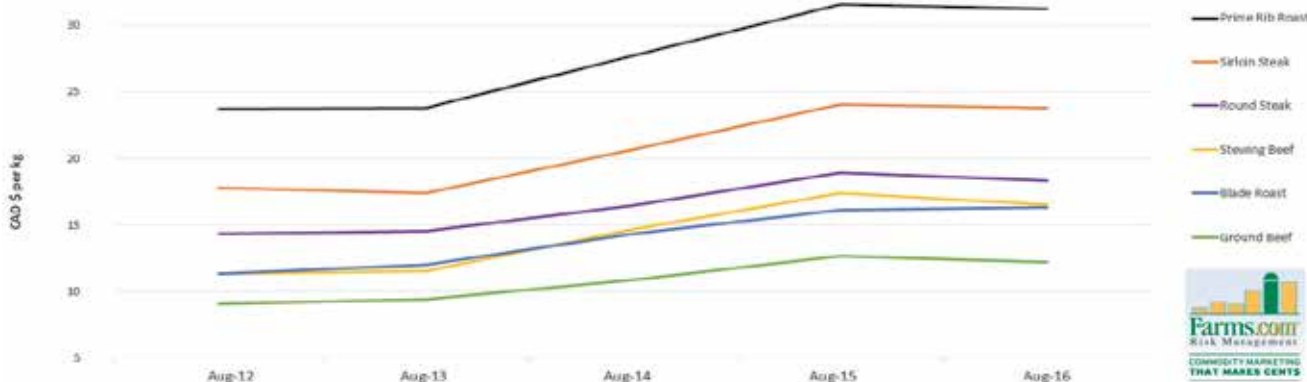


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Average Canadian Retail Beef Prices, 2012 to 2016



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pressure on the market. Record amounts of U.S. meat in cold storage, though, will remain a hangover near-term.

Looking to 2017, carcass weights and export demand (global growth) will be the key price drivers. The fact that the summer 2017 deferred future contract months are at a discount to nearby futures suggest that there is more risk to the upside in 2017, compared to current prices.

The worst may be behind us but, of course, we still need to get past the rest of 2016.

Cheaper feed is a blessing but farmers should not remain too complacent as feed prices don't tend to stay down forever.

According to averages from 40 year trends, grain prices tend to bottom between Oct. 1 and Oct. 8. Having survived the downside on cattle prices (which was a drop of over 40 per cent since its peak in summer/fall 2015), we may be headed towards an upward move in the cyclical beef industry.

Historically, however, markets take time to recover and it could take as long as one to three years. **BF**

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Limestone application basics

Learn about the type and rate of limestone application to correctly adjust the pH of your soils.

by DALE COWAN

The fall season is a great time to soil sample after the completion of harvest. It allows ample time for turnaround of soil reports from the laboratories.

After receiving the sample report, one of the first results to look at is soil pH. This single measurement of your soil indicates whether your soil is acidic, neutral or basic. The pH scale is read in the lab on an instrument with a logarithmic scale that ranges from 0 to 14. A pH below 7 indicates increasing acidity, a pH of 7 is neutral and a pH above 7 indicates increasing alkalinity.

The importance of knowing this reading is that the pH controls the solubility or availability of soil nutrients, as well as the availability of applied nutrients from manures, bio solids and commercial fertilizers. It can also be used to develop nutrient management strategies on fertilizer applications and methods of placement.

As soil pH drops below 6.2, the

soil is beginning to become acidic enough to warrant adjustments for most field crops. The adjustment to raise soil pH is accomplished with an application of agricultural limestone.

The limestone application rate is determined by another lab reading called buffer pH (BpH). When the soil pH drops below 6.2, labs automatically run the BpH test. (Some labs run the BpH at 6.5.) BpH measures the amount of acidity that needs to be neutralized.

The following steps are required to determine the application rate of limestone. First, determine the desired target pH for the crops to be grown in the rotation. Next, use the chart shown on the following page to locate the BpH and the resulting recommended rate of limestone. As an example, the target pH of 6.5 and BpH of 6.3 results in a lime recommendation of 5 MT/ha or 2.2 short tons per acre.

Once you have determined the proper application rate, you must

choose the most appropriate type of lime: calcitic or dolomitic. Calcitic contains mostly calcium carbonate and dolomitic may contain up to 13 per cent magnesium carbonate in addition to calcium carbonate. If the soil test value for magnesium is below 100 ppm, dolomitic is the ideal choice. Not only does this lime application neutralize the soil acidity but it is also the most economical way to add the essential nutrient magnesium to your soil.

But we are not done making the final rate decision just yet. We need to look at the Agricultural Index (AI). This is a measure of limestone quality. The chart below assumes you will use a limestone with an AI of 75. AI is a factor based on the neutralizing value and fineness rating of the lime.

The AI is determined by a lab test. The lab titrates for neutralizing value expressed as the calcium carbonate equivalent as a percentage and runs the sample through a series of sieves to get a particle size. Coarse particles



The adjustment to raise soil pH is accomplished with an application of agricultural limestone.

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Lime Requirements to Correct Soil Acidity Based on Soil pH and Soil Buffer pH

Buffer pH ¹	Target Soil pH			
	7.0	6.5 ²	6.0 ³	5.5 ⁴
7.0	0	2 (0.9)	1 (0.5)	1 (0.5)
6.9	3 (1.3)	2 (0.9)	1 (0.5)	1 (0.5)
6.8	3 (1.3)	2 (0.9)	1 (0.5)	1 (0.5)
6.7	4 (1.8)	2 (0.9)	2 (0.9)	1 (0.5)
6.6	5 (2.2)	3 (1.3)	2 (0.9)	1 (0.5)
6.5	6 (2.7)	3 (1.3)	2 (0.9)	1 (0.5)
6.4	7 (3.1)	4 (1.8)	3 (1.3)	2 (0.9)
6.3	8 (3.6)	5 (2.2)	3 (1.3)	2 (0.9)
6.2	10 (4.5)	6 (2.7)	4 (1.8)	2 (0.9)
6.1	11 (4.9)	7 (3.1)	5 (2.2)	2 (0.9)
6.0	13 (5.8)	9 (4.0)	6 (2.7)	3 (1.3)
5.9	14 (6.2)	10 (4.5)	7 (3.1)	4 (1.8)
5.8	16 (7.1)	12 (5.4)	8 (3.6)	4 (1.8)
5.7	18 (8.0)	13 (5.8)	9 (4.0)	5 (2.2)
5.6	20 (8.9)	15 (6.7)	11 (4.9)	6 (2.7)
5.5	20 (8.9)	17 (7.6)	12 (5.4)	8 (3.6)
5.4	20 (8.9)	19 (8.5)	14 (6.2)	9 (4.0)
5.3	20 (8.9)	20 (8.9)	15 (6.7)	10 (4.5)
5.2	20 (8.9)	20 (8.9)	17 (7.6)	11 (4.9)
5.1	20 (8.9)	20 (8.9)	19 (8.5)	13 (5.8)
5.0	20 (8.9)	20 (8.9)	20 (8.9)	15 (6.7)
4.9	20 (8.9)	20 (8.9)	20 (8.9)	16 (7.1)
4.8	20 (8.9)	20 (8.9)	20 (8.9)	18 (8.0)
4.7	20 (8.9)	20 (8.9)	20 (8.9)	20 (8.9)
4.6	20 (8.9)	20 (8.9)	20 (8.9)	20 (8.9)

¹ Buffer pH in Ontario is measured using the Shoemaker, MacLean and Pratt (SMP) buffer. Other jurisdictions may use different buffers, which will give similar but not identical results.

² Lime if soil pH below 6.1.

³ Lime if soil pH below 5.6.

⁴ Lime if soil pH below 5.1.

Source: Ontario Ministry of Agriculture, Food and Rural Affairs. Agronomy Guide for Field Crops – Publication 811.

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Example Calculation of Fineness Rating of a Limestone

Particle Size	% of Sample	Fineness Factor	
Coarser than No.10 sieve ¹	10	x 0	= 0
No.10 to No. 60 sieve ²	40	x 0.4	= 16
Passing through No. 60 sieve	50	x 1.0	= 50
Fitness Rating			= 66

¹ A #10 Tyler sieve has wires spaced 2.0 mm apart.

² A #60 Tyler sieve has wires spaced 0.25 mm apart.

Source: Ontario Ministry of Agriculture, Food and Rural Affairs. Agronomy Guide for Field Crops – Publication 811.

offer no value in neutralizing acidity. Therefore, coarse lime is discounted in the AI calculation. Any particle greater than a #10 sieve has zero neutralizing power. The above table illustrates the calculations to determine the fineness rating.

The Agricultural Index is determined by multiplying the neutralizing value by the fineness rating. Assuming a lab determination of 99 per cent neutralizing value multiplied

by the fineness rating of 66 from the table above results in an AI of 65. ($99 \times 66/100$)

To calculate the rate adjustment for limestone with differing AI, use the following equation:

Rate of application of limestone = limestone application rate from soil text x (75 ÷ Agricultural Index of limestone)

The adjustment that needs to be made to the rate from the previous

example is calculated as follows: $5 \times (75 \div 65) = 5.8$ MT/ha. An application of 5.8 MT of AI 65 limestone is necessary to have the same neutralizing power as 5 MT of AI 75 lime. This adjustment assures we are applying a sufficient quantity of limestone to make the necessary adjustment to the soil pH.

This adjustment is more important with limestone with a lower AI. If the limestone being used only has an AI of 45, the adjustment becomes $5 \times (75 \div 45) = 8.3$ MT/ha. This rate change is required for proper pH adjustment but the higher application rate needed adds to the application cost.

Choose limestone sources carefully, obtain a lab analysis of the Agricultural Index and be aware of necessary rate changes if the AI is different than 75.

It is also worth noting that if the AI was 85, the rate adjustment would be $5 \times (75 \div 85) = 4.4$ MT/ha. Rate adjustments can lead to either increased or decreased application amounts.

I have heard it said many times by farmers and industry personnel that limestone is limestone. I trust you now see there is more involved in determining the proper application of limestone. The goal is to adjust soil pH when the soil test indicates it is necessary using the correct type of limestone and the right application rate. **BF**

Dale Cowan is a senior agronomist with AGRIS Co-operative Ltd. and Wanstead Farmers Co-operative Ltd.



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Exploring conservation tillage options

Calculate crop residue and consider the best practices for your fields.

by PATRICK LYNCH

I recently had the opportunity to speak at a number of grower meetings focused on variety and hybrid plots. To add another dimension to the meetings, the organizers invited several companies to demonstrate their conservation tillage. (An early corn hybrid was planted and harvested before the conservation tillage.)

After each piece of equipment we would discuss the results. Was the tillage too deep? Was it level enough? Was there enough residue?

It became obvious during the first meeting that growers did not know how to measure the crop residue that was left. During the 1980s, we had to measure residue as part of a govern-

ment program that was giving grant money for conservation tillage. We had a "line transect." This was a 50-foot-long rope with knots at every foot. We would count the number of knots that had a significant piece of residue under them. Then, we would multiply this number by two in order to determine the per cent residue cover.

At the tillage demonstrations, we improvised. We used a metal plot stake that had holes about every inch. We counted the number of holes that had significant residue showing through the hole.

We counted the residue under 25 holes and multiplied by four in order



We used a plot stake to estimate residue cover.

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to reach the percentage. For example, residue under nine holes out of 25 would be 36 per cent residue cover.

You can do such calculations yourself in your fields.

The magic number for residue cover is 30 per cent. At this level, erosion is reduced to about one ton per acre. Farmers and industry representatives involved with soil conservation agree this is an acceptable level. I like to see about 40 per cent residue in the fall. You will lose some residue over the winter and some will move with rain.

The reason you want to have crop residue is to break the fall of rain drops. Rain falls and hits the ground at about 20 miles per hour. If rain hits the soil it breaks the soil particles apart. Once the small soil fragments break away they move into the pores in the soil that earthworms have formed. The soil fragments plug these holes. Then the water runs across the soil surface and possibly even off the field. Crop residue on top of the soil breaks the force of the rain drop. It also slows the movement of soil across the field.

The results of our demonstrations were interesting. First, growers were pretty good at guessing what per cent residue cover was left.

Secondly, the different conservation tillage tools left varying amounts of residue, ranging from less than 15 per cent to about 40 per cent residue. When the corn was combined, half of the header had stalk choppers and the other half was combined without chopping stalks. In some cases when the stalks were chopped with some types of equipment, there was less crop residue on top than if the stalks were not chopped. But, with other machines, the amount of residue was greater.

When managing residue there are a number of factors that affect the amount of residue left on the soil. The depth and speed of the tillage tool affects the per cent of residue cover.



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A variety of factors affect the amount of residue left on the soil, including the depth and speed of the tillage tool.

The set of the disc makes a difference. A more aggressive angle leaves less residue. The hybrid makes a difference. (Some hybrids produce more residue than others; some break down easier and some have more lignin.)

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Whether you chop stalks or not makes a difference. Generally, if you chop the stalks there is less residue. The soil type also makes a difference.

Be sure to experiment and see how much residue you have left. Remember you want a minimum of 30 per cent residue cover. To ensure your calculations are accurate, you should measure residue in a number of places across the field.

If you chop stalks, you should do some type of conservation tillage. If you do not engage in such tillage, then there will be a thick mat on the soil surface next spring. This mat will lead to a wetter, colder soil than if you

did not chop the stalks.

One question that was asked was, what if I have some knolls that tend to erode? Will 30 per cent residue cover be sufficient? Probably not. If this is your situation, then do not practice conservation tillage on the knolls.

Lift the equipment when you get to the knolls or go around them. This practice will help reduce soil erosion and give the neighbours something else to talk about. **BF**

Consulting agronomist Patrick Lynch, CCA (ON), formerly worked with the Ontario agriculture ministry and with Cargill.



In this plot, there was almost 30 per cent residue cover.

How far can technology take us?

Ag equipment and technology have developed substantially since the 1950s. Consider the advances in auto steering, GPS technology and the recent unveiling of concept autonomous tractors.

by RALPH WINFIELD

In late August, both Case IH and New Holland unveiled concept autonomous tractors. These announcements led me to reflect on the developments in our industry so far over my lifetime.

The early years

As a young lad in the 1950s, I remember my first tractor-driving lesson. My brother put me on the tractor, showed me the basic operations and then stood back. I soon learned to manoeuvre that 20-something horsepower Ford 8N that didn't have a fuel gauge or power steering. I persevered and became a reliable/dependable operator. I plowed with two-furrow plows, worked ground with an eight-foot cultivator and planted with an old 13-run grain drill on steel wheels. Strangely enough, I still have a Ford 8N tractor, as well as a 15-run grain drill, which is on steel wheels. Neither one has been in the field for the last 30 years.

Moving on

As an engineering student in the early 1960s, I had to program a massive IBM computer using the Fortran language and punch cards. I vowed then that computers would never replace the trusty slide rule — at least in my work. Looking back,



My restored Ford 8N tractor is still in use. It really has more sentimental than actual value.

I did pass the “computer appreciation course” and still have the log/log slide rule in my desk drawer for nostalgic reasons.

I also remember the first GPS I put on the combine in the mid-1990s to permit the yield monitor to provide yield maps. That early GPS had to receive a signal from a ground-based beacon in the United States in order to stabilize or correct its signal to the yield monitor. Those early yield maps provided some fantastically interesting comparative yield data within a field.

High-resolution satellite mapping

With the availability of these maps, it is absolutely incredible what you can see on and around your own properties, as well as those of the neigh-

bours. Fortunately or unfortunately at present, they only provide a one-shot look at crops and property boundaries. However, conservation authority personnel are working to permit digital map layering to highlight erosion-susceptible areas of fields and to see erosion rates. The availability of such information will allow conscientious operators to take action to minimize erosion, such as by switching to no-till farming or putting in grassed waterways.

Tracking systems

With the advances in GPS technology, farmers can now use auto steering to help eliminate planting overlap — which saves seed and fertilizer and reduces potential harvesting problems.

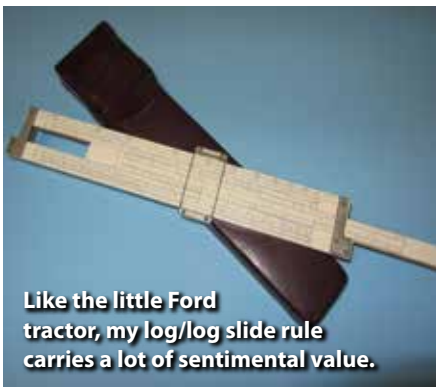
These same field-mapping systems

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are giving rise to the use of drone systems that can perhaps help to decrease the need for the traditional physical crop scouting to find stunted or discolored plants. These drone maps permit the zeroing in for specific soil testing needs or other crop suppressing issues.

Can driverless tractors or combines be far away from use?

Cars not only have backup cameras and proximity sensors, but some are

capable of parallel parking themselves on command. Some cars are also able to sense frontal proximity to other vehicles and slow down or “set” the brakes for faster response.

It has been reported that a young inventor, Matt Reimer, from near Killarney, Manitoba has operated a tractor remotely by using his laptop computer! Fortunately or unfortunately, the system cannot yet be used legally without an operator on board.

Jordan Wallace of GPS Ontario showed me a video of a working remote-control system operating a carrot cart alongside a carrot harvester in the Holland Marsh. Both units were following the predetermined path set out by the GPS. Since both units had to be operated simultaneously, they had to be circled back and could only work one way across the carrot field. (The carrots had been planted sequentially across the field and thus the harvestable carrots were only along one side.) By contrast,

given the high storage capacity of combines, there is only an intermittent need for a grain buggy to pull alongside when the combine grain tank is almost full.

In addition to the summer announcements of Case IH and New Holland, other equipment manufacturers have made notable achievements in the area of autonomous tractors. Fendt, a brand of the AGCO Corporation, won a gold medal at the Agritechnica in 2011 for its Guide-Connect — which enables two



Congratulations, Dale!



Better Farming writer **Dale Cowan** has been awarded the International Certified Crop Adviser's **ADVISER OF THE YEAR** award.

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Better Farming readers benefit from Dale's regular advice and insight in his popular YIELD MATTER\$ column, and he is expanding his focus in the magazine to include weather analysis.

Dale is also a senior agronomist and sales manager with AGRIS and Wanstead. In addition to advising large growers, he mentors 14 CCAs.

Well done and congrats, Dale. We salute you on this honour!

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tractors to work together under the control of a single operator. Similarly, Kinze Manufacturing, Inc. has developed an autonomous grain cart that can be brought alongside a combine when requested.

Conclusions

Many of us have lived through interesting times. I remember when we did not have hydro-electric power on the home farm. I not only milked cows by hand but I also drove a team of horses as part of the threshing gang when I was a teenager.

I did get that massive IBM computer programmed using Fortran to optimize the shape of a water channel — and passed the course.

I owned an early combine yield monitor and GPS that allowed me to acquire very interesting and informative yield maps. Did I envision an auto steering system for the combine at that time? You bet not!


I also remember my first attempts to off-load the combine on the move. The process required slowing the combine a nominal amount to ensure a constant ground speed and prevent spillage. I used hand signals to advise the grain buggy tractor operator to move ahead or back so we would get all the grain into the buggy. He, of course, used the harvested cornrows as his driving guide.

I envision a future where I will be able to watch a hands-free combine operator monitor and control a tractor and grain buggy alongside a combine using a computer or tablet.

By the way, I have not used my log/log slide rule in many years. The desktop computer and Microsoft Excel continue to make all the necessary calculations I need for “what if” scenarios and to do the farm accounting for tax purposes.


By contrast this article was dictated, by my wife (Joan), to one computer and transferred to three others via some cloud before she could get her iPhone out of her pocket! **BF**


Ralph Winfield is a retired professional engineer, farmer and technical writer.




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Ballasting a mechanical front-wheel drive tractor

When ballasting a MFWD tractor, consider the weight of the front and back of the machine, as well as the weight transfer from implements.

by JAAP KROONDIJK

Just hang a full set of weights on the front of my new mechanical front-wheel drive (MFWD) tractor and it will pull like a bear, I remember a customer telling me years ago! He had just purchased a new 220 horsepower MFWD tractor that he was going to use for some serious work. He had ordered the tractor with a nice set of radial tires, and his statement sure sounded like it

was going to work — but did it?

Next to equipping a tractor with the right size of tires inflated to the right pressure, ballasting the tractor properly is equally as important. And gone are the days when you simply filled up the tires with calcium to gain weight. That approach would likely ruin the effect of radial tires and make them as stiff as bias tires.

By simply looking at a MFWD

tractor, you can see that the front tires are smaller than the back tires. Using that observation you can draw the next conclusion: the front of the tractor is not capable of pulling nearly as much as the back. But, this fact gets overlooked all the time. If you want a tractor that will pull equally on all four wheels, you need an articulated style with equally-sized tires on the front and the back.

Another acronym used for a MFWD tractor is FWA, which stands for front wheel assist. I think we should keep this terminology in mind: the tractor is rear-wheel drive with a front axle that helps put traction to the ground. Typically, we think the tractor is front wheel drive, and the front wheels do the work. But what happened to the back of the tractor? It still needs to do the majority of the work, hence the bigger tires and likely a set of duals as well.

Most tractor manufacturers recommend a weight split from between 30 to 40 per cent weight on



This tractor has been properly ballasted. Notice the heavier weights on the back of the tractor, as opposed to on the front (also pictured on this page).



Notice the lighter weights on the front of the same tractor.

Gold Prize, Press Feature

Mary Baxter
Better Farming



Better Farming's April cover story "Vandalism and Theft on the Farm" has been awarded the Gold Prize, Press Feature Award by the Canadian Farm Writers' Federation.



The award was announced Oct. 1 in Saskatoon and recognized senior writer Mary Baxter's work on this important issue.

Mary's feature asked "is it time for tougher penalties and enforcement" and revealed that farm organizations believe stronger laws against trespassing and a firmer response by police are needed.

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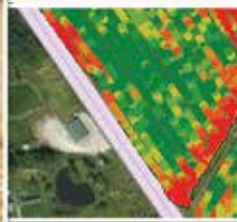
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the front axle and the corresponding 60 to 70 per cent on the back axle. The 30/70 split is increasingly becoming the norm, especially for a tractor that has to use its own weight to pull.

One such example would be a cultivator that does not transfer any weight onto the tractor pulling it. While pulling the cultivator, the tractor is overloaded on the front as opposed to the back, and will likely go in power hop mode. And power hop puts the tractor into an uncontrollable state of bouncing. In severe cases, the tractor even breaks free from ground contact. If you have never experienced power hop, talk to someone who has — it is an unnerving experience. You lose all control and end up going nowhere. You waste a whole lot of time and money, spinning your tires and wasting fuel.

On a MFWD tractor, the front axle runs faster than the back axle. The different axle speeds are needed to account for the different tire sizes so that the back tires will not push over the front tires. So the front will always need to be able to “slip” to get rid of the extra ground speed it runs.

Overloading the front of the tractor causes the front to pull too much and it will try to drag the back along. At a certain point, the front tires are inevitably going to break free from ground contact and possibly cause power hop or a mechanical failure somewhere in the drive line.

For average duty pulling, you need approximately 120 lbs. of weight per unit of horsepower. A 200 hp tractor, for example, would need approximately 24,000 lbs. total weight with approximately 7,200 lbs. on the front and 16,800 lbs. on the back.

A lot of tractors are built in such a way that the front is likely heavier than the recommended weight, while the rear is a lot lighter than recommended. So, putting a set of front weights on the tractor makes it look impressive, but does not improve performance. In fact, the addition of this weight on the front might hinder your performance with some unfavourable side effects — like power hop.

On several occasions, I have suggested that farmers remove their front weights or hang them on the back. Those who took this advice were pleasantly surprised. Unless you need those weights on the front for lifting a heavy three-point implement, don't hang them on the tractor until you have the rear of the tractor properly weighed down with a set of wheel weights or a ballast weight hanging on the quick hitch. The latter type of weight gives you the flexibility to remove it quickly if necessary.

If you are using an implement that will transfer weight to your tractor, you will need to account for that weight in your calculations. And, as noted in the October edition of *Better Farming*, remember to adjust your tire pressure so it will carry the weight properly but still allow enough flex in your radial tires for proper weight distribution and traction.

When in doubt, ask your tire supplier to provide small portable weigh scales so you have accurate weight and pressure recommendations directly from the experts. **BF**

Jaap Kroondijk is a farm boy mechanic who lives near Woodstock.



Following our discussion about ballasting, one of my customers made his own weight bracket to hang onto his quick hitch.

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National farm debt levels

Statistics Canada has released data on the 2015 farm debt levels and the Canada West Foundation is raising concerns about the implications of these figures.

by BARRY WILSON

Even for veteran agriculture watchers, this year's Statistics Canada tally of 2015 farm debt levels was (pick your cliché) eye-popping, jaw-dropping or just plain amazing.



Sarah Pittman

After 23 years of annual debt increases since 1993 that had more than tripled national farm debt levels from \$23 billion to \$84.5 billion in 2014, Canadian farmers piled on another \$7.3 billion in debt in 2015 to reach \$91.8 billion.

It was an 8.6 per cent increase in the level of debt, the highest one-year increase in history.

A few years ago when debt was billions of dollars lower, George Brinkman, distinguished University of Guelph professor and agricultural economist (emeritus), called it a "ticking time bomb" because:

■ An end to a long run of record-low interest rates would make the debt much more difficult and

expensive to service;

■ A decline in commodity prices or several years of climate-related crop failure would push many indebted farmers to the brink, since debt servicing comes from cash flow rather than asset value; and

■ American producers tend to have lower average debt levels and therefore less exposure and a lower cost of production, so they typically have a competitive advantage in markets where Canadian and U.S. agricultural products compete.

Still, rising farm debt levels have not been the subject of major focus in farm sector politics or mainstream

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political debate. This lack of discussion is certainly the case in Ontario. With many sectors coming off several years of good commodity prices and income, debt servicing hasn't been seen as a major issue. Besides, some might say farm asset levels are rising so what's the problem?

Well, according to the influential Calgary-based Canada West Foundation (CWF), a privately-funded policy think tank that examines economic issues affecting Western Canada, there are potentially several problems.

With a generational change and consolidation underway on many farms, more debt financing is inevitable to pay for buyouts and transition, even as some retiring farmers pay down debt.

And to assume that the current run of rock-bottom interest rates will continue indefinitely may not be the best farm financial business plan.

This summer, CWF published a



With a generational change and consolidation underway on many farms, more debt financing is inevitable.

YinYang/E+/Getty Images photo

discussion paper and launched a consultation with Prairie farmers on the debt issue.

Sarah Pittman, a Foundation intern involved in the project, says western farmer feedback has been varied with no consensus about the severity of the debt overhang or what could be done about it, but "it does seem to be a significant concern to many of our respondents."

She also raised some not-too-distant history to illustrate that changing

conditions can transform a manageable issue into a crisis.

In 1980, a Canadian farm population more than double the current level was carrying a debt of approximately \$23 billion, interest rates were stable and debt servicing manageable. Lending institutions reported a low level of defaults.

In little less than a year, the economy stagnated, interest rates soared into double digits and tens of thousands of farmers across the coun-



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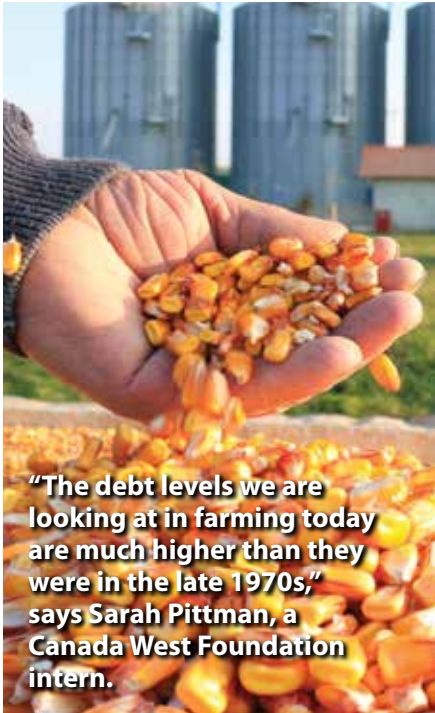
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"The debt levels we are looking at in farming today are much higher than they were in the late 1970s," says Sarah Pittman, a Canada West Foundation intern.

YinYang/E+/Getty Images photo

try found themselves unable to service debts and in threat of losing their farms. Many did.

Lenders became some of the biggest farm property owners in the country. The Farm Credit Corporation (as it was then known) needed a massive government bailout to cover losses.

"One of the reasons I find agriculture debt such a compelling story is (because of) some conversations I have had with my father (a farmer himself), particularly when talking about the debt crisis of the early 1980s," Pittman said in an interview. "Prime interest rates spiked in the early 1980s, which led to defaults on farming loans and an exodus of some farmers from the business. The debt levels we are looking at in farming today are much higher than they were in the late 1970s, before the debt crisis. This is an important lesson to remember."

At the very least it is a lesson farmers, their leaders and politicians should be reflecting on and discussing. **BF**

Barry Wilson is a member of the Parliamentary Press Gallery and specializes in agriculture.

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Promising discovery for controlling western corn rootworm

A recent discovery by researchers at **DuPont Pioneer** could help farmers manage western corn rootworm, a destructive insect that feeds on the roots, pollen

and leaves of corn and ultimately shrinks crop yields.

In a September press release **Neal Gutterson**, DuPont Pioneer vice president of research and development, said the company has discovered a “protein that demonstrates insecticidal control of western corn rootworm with a new and different mode of action.”

Traditional treatment for western corn rootworm relies on *Bacillus thuringiensis* (Bt) protein. Gutterson said that DuPont Pioneer’s discovery of a non-Bt protein “could be a critical component for managing corn rootworm disease in future corn seed product offerings.”

The research was published in *Science Magazine* in September. **BF**

Getting pesticides to stick on plants

According to *MIT News*, only two per cent of pesticide spray adheres to plants, while the remainder typically runs off of the plant surface. Researchers at the **Massachusetts Institute of Technology** are working on a solution that maximizes pesticide adherence to plant leaves and reduces this runoff.

The researchers have found that when a negatively-charged substance

meets a positively-charged substance on a plant surface, the combination results in improved adherence.

The approach requires the separation of pesticide spray into two portions and the addition of a polymer substance to each portion before application. The researchers plan to test their findings on small-scale farms in India in 2017.

The researchers published their



findings in *Nature*

Communications in August. **BF**



Innovative feed production to conserve water

Mario Daccarett, a California farmer, has found a way to keep his 500 sheep well fed while saving water in the process. He feeds his sheep a combination of oats,

hay and sprouted barley. He sprouts the barley seeds indoors using hydroponic containers and grow lights.

In an article posted on *npr.org*, Daccarett says he produces over 2,000 pounds of sprouts daily and uses “just two percent of the water it would take to grow the crop outside.” The seeds are misted hourly with water to start

germination. Within six days the sprouts stand six inches tall and are ready for consumption.

Hydroponic containers are expensive but Daccarett estimates he recouped his initial investment within a little over one year.

Daccarett says his sheep are pleased as well. He believes that barley grown indoors tastes sweeter. **BF**

Analyzing plant odour to detect disease

Imagine having the ability to identify a diseased plant by its scent before it showed any visual signs of distress. Early detection of the affected plant would allow you to remove it from your field before it posed a threat to the remainder of your crop.

XTB Laboratories in California has developed a technology which is able to achieve this goal, according to a September article on *SeedWorld.com*.

Specifically, XTB Laboratories uses volatile organic compounds (VOCs) — odours produced by plants and all living organisms — to detect the presence of disease. The technology has proven successful in citrus orchards. The company’s website indicates “XTB’s proprietary algorithms form the basis for a platform to address many other plant pathogens.” **BF**



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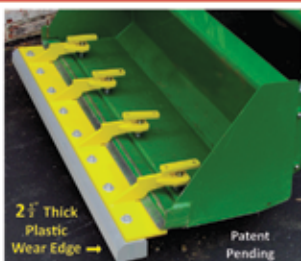
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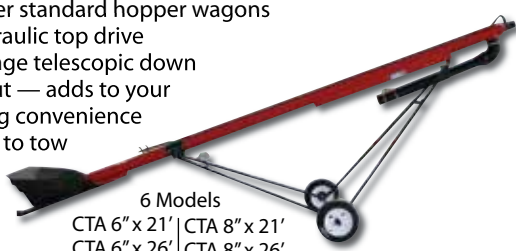

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