

Shawn Moen, CEO and co-founder of 9 Mile Legacy Brewing, helping with the harvest.

Garrett Pederson checking on the brew. Janelle Wallace photos

Hops grown on Moosomin area farm: 9 Mile Legacy Brewing and JGL Shepherd Farms create Saskatchewan's first commercially produced Fresh Hop ale

Earlier this month, 9 Mile Legacy Brew-Earlier this month, 9 Mile Legacy Brew-ing Co. Ltd. of Saskatoon sent a delegation to a farm just a few miles southeast of the town of Moosomin with one goal—to par-ticipate in the hop harvest at JGL Shepherd Farms and take several kilos of fresh hops back to the brewery as quickly as possible. "Fresh hop beers are a harvest-time treat in places where the local hop industries are more established," notes Justin Shep-herd, member of JGL Shepherd Farms' family farm operation and visionary for its

The operation of the second state of the secon

"Time is of the essence with these sorts of beer—before the hops are dried down in an oast house, the lupulin oils are ex-tremely volatile and the cones are very vulnerable to oxidation and will begin composting. With a fresh hop ale, you are using non-processed hop cones and trying to capture a bright, fresh hop flavour. Ide-ally, the brewery should get the hops into the kettle within hours of harvesting from

the vine."

After spending the night at the Shep-herd family farm and experiencing some great small-town Saskatchewan hospital-ity, the team from 9 Mile Legacy Brewing woke up at the break of dawn and got to work the time eith hereak of dawn and got to

work helping with harvest. For some of the members, it was the first time that they had seen a commercial hop

"There have definitely been other fresh "There have definitely been other fresh hop beers in the province—we've done one in our old brewery—but because the hop industry in Saskatchewan is virtu-ally non-existent, these historically are the result of hops grown in backyards or by hobbyists rather than by a commercial farming operation such as JGL Shepherd Farms," explains Shawn Moen, CEO and Co-Founder of 9 Mile Legacy Brewing Co. Ltd. Ltd.

"The significance of this sort of fresh hop beer goes beyond what we hope to be a great experience in the glass. It is a celebration of Saskatchewan innovation and

continued investment in non-typical agri-value projects. Many people rule out hops in Saskatchewan from an agronomic and quality perspective—JGL Shepherd Farms is proving that it can be done." As the fresh hops raced back to Saska-toon, 9 Mile Legacy's brewing team was in constant communication with the "hop couriers" and was timing the hrew so that

couriers" and was timing the brew so that, when the hops arrived, they could be im-mediately added to the boil.

"To me, the fun of brewing is all in ex-perimentation—pushing boundaries and discovering new flavours. As a brewer, a fresh hop beer fits right into that because the flavours are so unique and tempo-rary," says Garrett Pederson, 9 Mile Lega-cy's Head Brewer and Co-Founder.

cy's Head Brewer and Co-Founder. "But, as a farm boy, a Saskatchewan fresh hop beer signifies even more. We have always chosen to use Saskatchewan it before in our beer, because it allows malt barley in our beer, because it allows us to keep the value-added ag supply chain at home. It helps that we happen to grow the best barley in the world! A

commercially grown Saskatchewan hop completes that supply chain and we are excited to see what unique qualities are produced when grown here." The 2018 Homegrown Fresh Hop Ale was released on Friday, September 21 at

the 9 Mile Legacy Brewing Taproom in Saskatoon.

"It is going to be a real moment of pride to taste our hops in the glass after years of planning and growth," says Shepherd. 9 Mile Legacy Brewing is a nano-brew-ery located in the Riversdale neighbour-

hood of Saskatoon. Its name refers to the distance between the Moen and Pederson family farms in Southwest Saskatchewan ramity farms in Southwest Saskatchewan and seeks to perpetuate a tradition of com-munity engagement and good neighbours. JGL Shepherd Farms is a three-gener-ation family owned and operated farm located near Mossomin and has recently

started producing high-quality, locally-grown hops for Saskatchewan's brewing industry.

Continued on Page C3





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Justin Shepherd, right, and Garry Beckett feeding the hops into the harvester that separates the hops from the bines.

Shepherd pleased with hop harvest

Continued from front This is only the second harvest for JGL Farms, and harvest for JGL Farms, and Justin Shepherd says he is pleased with how the hops turned out this year. JGL Farms is the only farm in Saskatchewan venturing into major hop production in the hopes of providing Saskatchewan breweries with their product on a regular basis

The hops were harvested from Sept. 4-17. "The yield definitely sur-prised us," said Justin. "It was better than expected. Yield isn't only one por-tion of it the quality really. tion of it, the quality really matters, so wê are just in the process of getting qual-ity results on the different types of hops we grew, but the quality looks pretty good at the moment. The brewers who have tested the hops so far have had really nice things to say about

Two batches of hops have been already sold to breweries this season—the one to 9 Mile Legacy Brew-ing, and one batch to Great Western.

"We've reached out to all the brewers in the province and it's just a matter of finding groups that want to work with us, and hopeto work with us, and hope-fully at some point most of them want to work with us," says Justin. "But 9 Mile has been really interested and very good to work with and very interested in Saskatchewan products. We are a natural fit for them, so it was excellent hosting them. It was good to show them around the farm and meet the family, because I think we do have because I think we do have a good story to tell, being a family farm with family



The hops being collected as they come out of the harvester.

working on it. "Beer marketing seems like it's a real skill and they seem to have a fantas-tic group who does it. So it's been fun to work with them on a fresh hop beer, and hopefully next year we do a few more of those. But for a first one we are really excited to have that come

out. "It's awesome. That's my goal—we are hopefully going to produce enough hops to sell them in Sas-katchewan. We aren't really looking at any other markets at the moment. Hope-fully other brewers see it and think that's something they want to participate in as well."

Justin anticipates he will e able to sell all of his hops

this season. "Even though the yields

were good for what we ex-pected, it's still a relatively small amount of hops," he said. "So it shouldn't be that hard to sell them. Great Western will be brewing with them in about three weeks. We are kind of working with brewers on the smaller side as well as the larger end as well."

the larger end as well." He says Great Western's beer using his hops should come out in October some time.

He says JGL Farms will likely expand their hops operation for next season.

"The plan is to expand. We'll continue working to-wards expanding through the fall, winter and spring, and we'll see how that goes. At some point next year hopefully we will be able to put a few more plants in the ground," says Justin.



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Monday, September 24, 2018

Rooting out secrets to creating better crops

C4

BY SARATH PEIRIS Internationally recog-nized plant scientist Leon Kochian, Canada Excel-Research Chair lence lence Research Chair (CERC) in Food Systems and Security at the Uni-versity of Saskatchewan, has been granted \$800,000 by Innovation Saskatchewan to equip a new re-search laboratory that will

search laboratory that will improve crop productivity and resiliency. Using the Canadian Light Source synchrotron, the cyclotron at the Sas-katchewan Centre for Cy-clotron Sciences, and other advanced imaging equipadvanced imaging equip-ment, Kochian aims to in-crease crop yields to feed a hungry world, whose pop-ulation is expected to reach 9.7 billion by 2050.

9.7 billion by 2050. The aim is to breed bet-ter cultivars of plants such as wheat, lentils and canola with improved root traits that help them cope with a range of soil-based stress-es, including drought, low buyels of essential mineral levels of essential mineral nutrients, and pathogens. "We are using the fund-

ing from the province to take advantage of novel cutting-edge technologies associated with the U of S and Saskatchewan to look at root form and function in ways not possible until now," said Kochian, a pro-fessor in plant sciences and soil science in the College of Agriculture and Biore-sources, and associate di-rector of the U of S Global Institute for Food Security (GIFS).

Along with provincial funding through the Inno-vation and Science Fund (ISF), the Roots of Food Security laboratory received \$800,000 from the Canada Foundation for Innovation (CFI), \$9,000 from the U of S, and \$391,000 from in-kind vendor contributions

kind vendor contributions to provide cutting-edge technology. "The advances in funda-mental research made at this laboratory by these tal-ented researchers will posi-tion Canada strategically to address elobal food secuaddress global food secu-rity challenges by driving change in agricultural and



food security technologies, practice and policy," said Karen Chad, vice-president Research at the U of S.

A significant part of re-search will focus on plant root systems, root archiroot systems, root arcti-tecture and root function in acquiring the mineral nutrients, nitrogen, phos-phate and potassium, and water under drought conditions

"To do this, we have been developing more so-phisticated tools for imag-ing root architecture and function of roots grown both hydroponically and in soil," said Kochian.

"It turns out that plants have a significant genetic control over how they distribute their different root types in three dimensions

in the soil. That's turning out to be a very important trait for improved nutrient and water acquisition effi-

ciency of plants." With CERC money, Ko-chian has hired two faculty members, a computational biologist from Cornell Uni-Incluses from Cornellium biologist from Cornellium lecular and cell biologist from University of Cali-fornia Davis. He is in the process of hiring two more researchers for the highly multidisciplinary work be-ing done at the facility. The program will pro-vide unique training op-portunities for the next generation of agriculture scientists. Kochian foresees up to 15 post-doctoral fel-lows and up to 15 gradu-ate students training in the

laboratory. "We are hiring world-class faculty, and attract-ing top scientists," he said. Post-doctoral fellows so far have come from the United States and Mexico, and as far away as China, Japan and India.

Ultimately the research will dramatically accelerate the pace of plant breeding to improve crops globally, and ensure that Canada maintains its position as a leading agricultural pro-ducer. Prairie agriculture ulter. Prairie agriculture will benefit from advances in crop resiliency and im-proved crop performance, he said As well, Kochian is

working to solve problems in African crops such as maize and sorghum since GIFS also focuses on ag-riculture in developing countries.

The ISF funding mostly will be used to purchase more lab equipment from large companies, but some money is being invested in building unique tools for sophisticated imaging of

roots. For instance, the lab group is building a three-dimensional root imaging system that enables the images to be translated into 3D reconstructions. Researchers will then be to quantify different root ar-chitecture traits from hundreds of varieties of spe-

cific crop species. Genetic mapping of these traits can identify the genes (and associated moecular markers) leading to differences in root architecture that enable the plant to more efficiently capture

"One of the biggest ad-vances in biology in recent years has been technologi-cal," Kochian said. "We are often studying similar questions to what I studied earlier in my career, but now we are able to look more deeply into the underlying processes control-ling these complex traits."

Sarath Peiris is Assistant Director of Research Profile and Impact at the U of S.



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Winter-like harvest weather threatens crops

BY RICHARD KAMCHEN Western Canada's har-vest weather has been far less than ideal after an already challenging growing season.

season. To be a season for the pounding rain, hail and even snow disrupted field operations in different parts of the three Prairie provinces. Alberta was belted with snow last week, beginning in northern parts of the province on Tuesday night and spreading south and southeastward through Wednesday and into Thursday, says Environment Canada.

into Inursday, says Envi-ronment Canada. The Grande Prairie re-gion received 12 centime-tres through Thursday, with Hendrickson Creek south of Grande Prairie and west of Edmonton reporting the most at near-ly 14 centimetres.

If 14 centimetres. "If it ends up being a crop that lodges severely, then there's potential im-plications for yield," says Mark Cutts, a crop spe-cialist with Alberta Agri-culture. "And if it's down there and continues to get wat those could be some there and continues to get wet, there could be some implications for quality." More snow fell on the weekend. If quality is downgrad-ed, then there's potential for more grain to enter the feed market, Cutts adds. Meanwhile

Meanwhile, stormy weather in Manitoba brought with it rain and hail The province's agricul-

ture department reported



hail damage to mature soypart of eastern Manitoba bean crops in the central Continued on page C11

A salute to Agriculture Producers

I would like to express my appreciation to our agriculture community for the enormous contribution you make to our

province's economy.



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How to improve farm safety for kids

BY CATHERINE TRASK AND VALERIE L. ELLIOT Agriculture is rated among the most dangerous industries by the Internation-al Labour Organization, and not just for adults.

adults. Children living on farms experience ex-ceptionally high risks of traumatic injury, and evidence for this high risk has been documented many times over many years. Historically, health researchers and pub-lic health advocates have tried to counter these statistics by communicating the high rates of injury and the source of the haz-ards and by instructing parents to keep kids away from the hazards. Still, rates of child injury remain high.

what has been missing is an understand-ing of why parents chose to bring their kids into the farm work environment. So, this time, our team of researchers-from the University of Saskatchewan, Queen's University and the Marshfield Clinic Research Foundation-decided it was our turn to listen.

Learning farm culture At first glance, a work environment with

At first glance, a work environment with heavy machinery, chemicals and confined spaces doesn't seem like a good place for children. They aren't present at mines or construction sites. But a farm is different because it is also a family's home. Our research team conducted in-depth interviews with 11 rural Saskatchewan farm parents and found that they see a lot of benefits to exposing their kids to farm work. These include: meeting the family's needs for child care and family time; build-ing work thic, responsibility and pride: needs for Child care and family time; build-ing work ethic, responsibility and pride; and the positive impacts of involvement in the family's agricultural heritage. Unfortunately, previous health promo-tion efforts haven't really acknowledged

tion errorts haven't really acknowledged these benefits or the parent's perspective in weighing out the positives. Imagine you are a farm parent taking care of the kids during a busy harvest sea-son. You have been with the kids at home

Bringing kids onto the farm is an opportunity to expose them to farm culture.

for the morning and need to bring a meal out to those working in the field. Do you bring the kids with you, or leave them in the house? On one hand, there could be tractors

and other heavy machinery, ponds and the general rush and hustle of adults focused on completing the task at hand. On the other hand, kids who see farm work get a chance to connect to farm culture and can radually learn to take on these tasks, plus hey'll be taught how to do tasks safely. Bringing the kids along also avoids leav-ing young kids at home alone. Different parents might make different choices in these situations, but all parents

are faced with balancing the pros and cons

in their family context based on their expe-riences and family characteristics. Lead author of the study, Valerie, grew up as a farm kid and raised her own children on the farm, so she understands the tricky tradeoffs that parents face.

Complex decision-making While studying how farm parents bal-ance the potential risks with the perceived benefits of farm life, we discovered a com-plex decision-making process that involves weighing risk-reward tradeoffs. After talk-ing with farm parents, we developed a framework showing a scale—balancing potential risks and benefits. "Tipping the scales" to make a decision about brineine kids into the farm environ-

about bringing kids into the farm environ-ment depends on parental perceptions, and these perceptions are in turn influ-enced by a personal history in agriculture, prior knowledge, past experience, charac-

teristics of children and safety norms in their family and community

If we have a better understanding of how farm parents make these decisions, we'll have a better chance of working to-

we'll have a better chance of working to-gether to find strategies that work. Even though many farm parents were raised on farms themselves and recognize the importance of farm safety for their families, serious child injuries and deaths continue to occur. The study showed us that parental decisions of whether to bring children into the farm work area depend on control. on context.

The Conversation

Our hope moving forward is that this framework will contribute to future pre-vention strategies aimed at harm reduc-tion, by considering both the perceived risks and benefits that play a role in farm parents' decision-making.



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U of S researchers uncover insect-resistant genes in wheat

BY FEDERICA GIANNELLI A recent PhD graduate at the University of Sas-katchewan is among the first researchers worldwide to apply the groundbreak-

to apply the groundbreak-ing sequencing of the bread wheat genome to develop more pest-resistant crops. Kirby Nilsen has used the new sequence to identify genes in wheat that can help the plants resist wheat stem sawfly—a pest that may cause yield losses of up to 30 per cent annually to the \$11-billion Canadian wheat industry. industry. His work was a key com-

ponent in breakthrough research published Thursday in Science, in which a U of S research team led by Cur-S research team led by Cur-tis Pozniak, a researcher and wheat breeder at the Crop Development Centre (CDC) in the U of S College of Ag-riculture and Bioresources, played a key role. Nilsen worked as a PhD

student on the project with

Pozniak. "Without using the com-plete wheat genome se-quence, it would have taken years to find the genes as-sociated with stem solidness," said Nilsen, now an assistant plant breeder at the CDC.

Nilsen has found solid stems in wheat are key to resisting the damage saw-flies cause to stems. Unlike hollow stems, solid stems hinder the survival of sawflies by acting as a barrier. With hollow stems, the in-sects reach the base of the plant, causing the stem to break and leading to harvest losses

Solid stems are thought to improve the abil-ity of wheat to endure heat stress

"We have completed the we have completed the wheat genome jigsaw puz-zle with all the pieces put together in their correct po-sitions and order, providing an enormous advantage for breeders when searching for genes that control important traits in the crop," said Pozniak

The solid stem wheat varieties Nilsen has analyzed show multiple identical copies of the solid stem gene-information that will be useful for developing new insect-resistant varieties.

"Now we can select desirable genes for breeding in just days, and it will be easier for scientists to discard plant lines that carry unwanted traits," he said. Nilsen said the wheat genome sequence is help-

ing breeders select the solid stem trait by using a molecu-lar marker-assisted selection technique which identifies at the DNA level the genes in plant lines that carry the hollow or solid stem traits.

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The mapping of the bread wheat genome has been pre-viously thought an impos-sible task because it is five times larger than the human genome and more complex. By using cutting-edge se-quencing technology from

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of S industrial partner NRGene, Pozniak and more than 200 scientists from 73 institutions in 20 countries have been working over the past 13 years on finalizing the genome sequence. The project was part of the In-

Researcher Kirby Nilsen in a wheat field.

ternational Wheat Genome Sequencing Consortium (IWGSC). Pozniak and Nilsen are

rozniak and Nilsen are currently working to re-move the solid stem genes from plant lines and add-ing them back to further validate the role these genes play in controlling stem solidness.

"I have been learning a lot from Dr. Pozniak, a world research leader in wheat genomics who is involved in projects that will have im-

tion, the Saskatchewan Ministry of Agriculture, SeCan, Saskatchewan Wheat Devel-opment Commission, Alberta Wheat Commission, the Manitoba government, Vit-erra, and DuPont Pioneer.

plications on a global scale." said Nilsen. The research was con-ducted via the Canadian ducted via the Canadian Triticum Applied Genomics project, and jointly funded by Genome Canada, Ge-nome Prairie, Western Grains Research Founda-

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CCA concerned about new Fisheries Act

The Canadian Cattlemen's Association is asking the Senate to remove a last-minute addition to the definition of fish habitat in the Fisheries Act that the CCA says will make it nearly impossible for beef and agricultural pro-

The action of the core were if there are of the first pro-ducers to be in compliance with the Act. The addition of subsection 2(2) to Bill C-68 (Fisheries Act) greatly expanded what can be deemed fish habitat. Subsection 2(2) is problematic because it deems areas with the necessary water flow characteristics to sustain ecosystems of fish habitat to be fish habitat.

This is the case even if there are no fish using the area

for any life process. The expansion of fish habitat results in practically all water bodies being fish habitat or deemed fish habitat. Under the Act anyone would be in contravention if they

Under the Act anyone would be in contravention if they alter, disrupt, or cause destruction of fish habitat. The House of Commons passed Bill C-68 on June 20, 2018 and amendments, including the addition of the sub-section, were added late in the committee process with little debate or consultation prior to third reading and nassage

passage.



If the Bill is left as is, the CCA believes there is potential for more activities associated with cattle grazing and production to be in contravention of the Act.

With the Bill now before the Senate, the CCA is asking for the subsection be removed as part of a suite of recom-mendations regarding Bill C-68. In its submission to the Senate, the CCA makes five

recommendation which include: remove subsection 2(2) the deeming habitat provision; address the regulatory burden on the agricultural sector by providing a stream-lined process and approval or exemption criteria for small and low risk activities; and, establish clear and enforce-able guidelines for artificial infrastructures or exempt ar-tificial infeaturetures. tificial infrastructures.

The CCA has also requested an opportunity to present to specific committees. The ramifications of subsection 2(2) for agricultural

roducers and rural municipalities are significant and range from cattle crossing man-made ditches to access pasture to run-off of pesticides, nutrients and sediment due to heavy precipitation or flooding events.

Even treating non-fish bearing water sources for blue-green algae could potentially be in contravention of the

Act. While dates for Senate presentation are yet to be deter-mined, the CCA says it will ensure cattle producers' con-cerns and recommendations on Bill C-68 are raised with lawmakers in Ottawa this fall.





Winter-like harvest weather threatens crops

** Continued from page C5 Keystone Agricultural Producers presi-dent Bill Campbell says the rains and re-sulting mud will complicate harvest op-unities. erations

"The headers don't slide as well in the "The headers don't slide as well in the ground and it's a little harder getting around the yards," Campbell says. Temperatures have been iciest in Sas-katchewan, with the mercury dropping to as much as -5 Celsius in the northeast ear-lier this month. "North have accessed the demans and

"Most have assessed the damage and have either swathed the crop to preserve as much yield as they can in canola, or left it stand to finish out maturity if they felt that the frost was not as bad, or if the crop was mature or almost mature," says provincial crop extension specialist Daphne Cruise.

26-month term

Across Saskatchewan last week, cool and rainy weather stalled most harvest progress.

eptember is usually when the majority of the crop gets harvested, but the long-range forecast is calling for cool and cloudy, and there is a lot of crop still out," Cruise savs.

She notes it's too early to tell if weather damaged crops will be destined for feed markets.

markets. "In most cases, we tend to see crops be-ing blended with better quality grain or cleaned and sorted as best as possible to obtain a better sample."

Farmers are trying to make the best of poor harvest conditions, but it's too soon to determine the extent of damage. Crops may end up being blended with better quality grain to get the best samples.

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U of S student awarded \$150,000 U.S. fellowship to advance canary seed research

BY SARATH PEIRIS Suneru Perera, a PhD student at the Uni-versity of Saskatchewan, is the only Canadian to be awarded a \$150,000 US fellowship by a U.S. agricultural research organization to develop processing techniques to expand the uses of canary seed, and help hone the skills he will need to succeed as an industry

Scientist. The Foundation for Food and Agriculture Research (FFAR) announced today that Per-era, whose Research and Professional De-

era, whose Research and Professional De-velopment Fellowship will provide \$50,000 US annually for three years, is among 17 re-cipients awarded its inaugural fellowships. The awards are jointly funded by FFAR and industry partners. "This is an exciting opportunity to get my PhD and fulfil my dream. With funding for three years, I can fully dedicate my time to research," said Perera. "And I really like the opportunity to develop leadership and in-terpersonal and communication skills I will need." FFAR was created under the 2014 U.S. Farm Bill to support food and agriculture

Farm Bill to support food and agriculture research, and foster collaborations that enhance sustainable food production to meet the needs of a growing global population that will reach 9.7 billion within 30 years.

"We want to develop value-added appli-cations for canary seed, which right now is mostly used for bird seed," said Perera. "We

mostly used for bird seed, "said Perera." We are trying to take it to the next level." Research at the U of S Crop Development Centre was instrumental in having hairless canary seed (hairs on the bird seed variety causes itching in humans) approved for human consumption by Health Canada in

Perera's academic supervisor in food and bioproduct sciences at the U of S College of Agriculture and Bioresources is Michael Nickerson, who said the FFAR fellowship offers many benefits.

"Something that's really great is that the investment all goes directly to Suneru. Not only are they recognizing his excellence as

a student, but they are also providing him with a lot of skills that make him more mar-ketable at graduation," Nickerson said. As well, he said, the fellowship is a huge win for the province and the university.

"It speaks to the excellence of the students coming into our programs, whose work is going to be internationally recognized." Perera and Nickerson are working on separating the fractions—starch and protein-and optimizing the market value of these products.

"As ingredients, these will be a lot more valuable than the crop as a whole," Nicker-son explained. "From our end we do the inson explained. "From our end we do the in-novations around the ingredients, and once we understand their properties, we look to partners such as the Saskatchewan Food Industry Development Centre to actually start integrating them into products." POS Bio-Sciences in Saskatoon, a bio-processing, research, development and commercialization company that employs

Perera as a scientist in its protein and carbo-hydrates division, supported his decision to pursue a PhD and agreed to be his industry partner for the fellowship.

FFAR fellowships provide a tremen-dous opportunity to promote collabora-tion throughout North America in applied research to advance the agrifood industry, said Rick Green, POS President of Intellec-treal Corritor tual Capital.

As the industry mentor, Green said his role is to help Perera understand the po-tential of canary seed research and link it to possible commercial applications in the industry. There's a such a growing demand for protein that the canary seed research is very timely, he said.

for protein data the state of t



Suneru Perera (left) and Michael Nickerson.



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A view on soil salinity from an agronomist's window

WENDY SCHATZ LEEDS, PAG, CCA LEAD AGRONOMIST SHARPE'S CROP SERVICES

Many of our fields had obvious patches of salinity this past summer. As my title suggests, this is an agronomist's perspective. I will give you a quick overview of salinity and some management ideas. If you ever get a chance to learn about soil salinity from the great Dr. Les Henry, take it! That depth of soil knowledge is irreplaceable!

First off, do you call the pesky white patches in your field "alkali"?! I often hear this term and in all honestly I may have been guilty of using it as well! Alkalinity occurs in soils with a high pH (over 8.5) and a high sodium content. There are virtually no true alkali soils in Saskatchewan. Our patches are "saline" which are the result of a high concentration of naturally occurring soil salts. The high salt concentration in these areas prevent water and nutrients from entering the plant roots, slowly starving the plant.

plant roots, slowly starving the plant. Ground water is the main culprit of our salinity. The past wet years have driven up the water table (Figure 1). Capillary rise brings water and salts to the root zone and soil surface.

face. The past summer was considerably drier than usual. In many areas this was welcomed to help bring the water table down. But we had little precipitation to wash the salts back down as the water table started to recede. This left more obvious saline areas in our fields.

Management of these areas requires time and possibly some "outside the box" thinking. We have to think about what will move the



Figure 1: Wet / Dry Cycles courtesy of Marla Riekman, Manitoba Agricultur

water table down and then hope for rainfall to move the salts down and out. The often used practise

of tillage in saline areas may not be an ideal solution. It could make salinity worse because it increases evaporation which will draw more salt filled water up to the root zone and surface.

A perfect way to utilise soil water is to get a crop established and use the power of roots. Most of our common crops like wheat and canola are tolerant to moderate salinity with barley being the most tolerant. Anyone who grew soybeans last year will know that they are not tolerant of salinity. Think about crop selection this spring if you have fields displaying more saline areas. If a crop can get established in these areas, good root development will help draw ground water down. Kochia became a "crop"

Kochia became a "crop" this past summer in many saline spots. Kochia is very salt tolerant and can root up to 10 feet deep. I would never advocate letting kochia increase in population on your farm. But if you could manage seed production with an operation like mowing, it is at least a plant that can grow in these salty areas and have a chance at reducing water levels. Severely saline areas

Severely saline areas might require you to take these pieces out of production and plant a salt tolerant forage. You may be rolling your eyes right now at this suggestion! But in the long term the forages will draw down ground water allowing land around the saline patch to be productive.

Title drainage is a costlier alternative but can also be very effective in the long term. Sub surface tile will help keep the water table down by allowing the movement of excess water out of the soil profile. The key take home mes-

The key take home message on salinity is that there are no quick fixes, we can only work to manage it. Do not fall into the magical quick fix product sales pitch. Save your hard earned dollars for more long-term, successful solutione



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Have a safe harvest!



How to show consumers the benefits of genetically modified foods

BY DAVID DI ZHANG AND GRANT ALEXANDER WILSON USask researchers have

found that changing the value proposition from in-dustry-centric to consumercentric may help to mitigate the negatives with GM food. associated

Genetically modified (GM) foods for human con-sumption have long been a subject of intense public debate, as well as academic research.

Despite the lack of sci-entific evidence to suggest GM foods are less safe than conventional foods, previ-ous studies have shown that consumers are reluctant to fully embrace them and are wary about the technology that produces them.

that produces them. In our upcoming article in the Journal of Commer-cial Biotechnology, we show that consumers' attitudes toward GM foods, their willing to gay could be sig-nificantly improved if GM products had a direct ben-efit to them personally. Our findings at the Uni-versity of Saskatchewan's Edwards School of Business

Versity of Saskatchewan's Edwards School of Business have the potential to change how agriculture biotechnol-ogy companies promote their products—while also

reating significant value. Particularly, we found that consumers are willing to accept and pay premi-ums for GM foods that have value that's personally rel-ount to them. evant to them.

In other words, chang-ing the value proposition from industry-centric to

consumer-centric may help to mitigate the negatives as sociated with GM food.

FOOD INSECURITY IS CRITICAL In 2009, the Food and Ag-riculture Organization of the United Nations iden-tified global food security as an increasingly critical issue as the world popula-tion grows, and said that meeting the growing de-mand for food will require agricultural biotechnology. Therefore it's necessary to

Interetore it's necessary to build widespread consumer support for GM foods. Creating GM food with direct consumer benefits could play a pivotal role in consisting or the support. Not gaining such support. Not only does promoting direct consumer benefits have the potential to change per-ceptions, as shown by our study's data, it may also be

a profitable endeavour. We surveyed 750 Cana-dian consumers on differ-ent ways of presenting GM foods. The first group of con-

The first group of con-sumers saw ads for GM foods that promoted several industry-oriented benefits that might indirectly ap-peal to consumers, such as higher yield, less pesticide usage and enhanced global food supply. These mes-sages were similar to those typically promoted by GM food proponents. The second group of con-sumers saw ads focusing on direct consumer benefits, such as better taste and en-hanced nutrition.

hanced nutrition.

The third group of con-sumers saw ads for GM foods that promoted both



Genetically modified foods could be made more attractive to consumers by underscoring how they personally benefit from them.

direct and indirect consumtions-and they were willing to pay a premium for such products.

er benefits. The result of the survey showed that, not surpris-ingly, the participants in the first group were less inclined to buy GM foods numer to buy GM foods even at a price that was sig-nificantly lower than com-parable non-GM foods.

The consumers who were accepting of GM foods ap-preciated that GM technolpreciated that GM technol-ogy had positive benefits and was creating value. However, they believed that the technology has only benefited the industry, and demanded that a portion of the value is passed onto the consumers.

In contrast, the partici-In contrast, the partici-pants who were presented a value proposition that directly benefited both the industry and consumers reported better attitudes toward GM foods, expressed higher purchase intenhigher

with higher income (consumers with higher income might be less likely to accept GM foods), prior knowledge and family situations, etc. Genetically modified foods could be made more

The agricultural biotech-nology industry needs to be a set of the agricultural biotech-nology industry needs to place consumer interests at the centre of their focus, not only at the time of selling their products, but also dur-ing the research and devel-

ed.

not consumers were reluc-tant to accept them. A 2016 study conducted meta-analyses that re-

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ORGANIC

WHY CONSUMERS DO, OR DON'T, ACCEPT GM FOODS These findings suggest that how consumers assess the value of GM foods to

the value of GM foods to themselves personally, as opposed to solely how or why the food is made, is fundamental to consumers' attitudes, purchase inten-tions and willingness to

pay. Many previous studies

have examined consumer perceptions of GM foods and explored why or why

II PIIPELINE FOODS

viewed hundreds of prior studies and how consum-ers' personal characteristics could influence their ac-ceptance of GM food. Those factors included gender (men might be more likely to accept genetically modi-fied foods than women), ed-ucation. income (consumers ucation, income (consumers

attractive to consumers by underscoring how they per-sonally benefit from them. In other words, the em-phasis has been on figuring out how to change consum-ers so that they would ac-cept GM foods. But our research points to the need for the GM indus-try to change how it's pro-moting the products and to

ing the research and devel-opment processes. Indeed, in a previous University of Saskatchewan study, we found that in Canada, consumer-oriented biotechnology companies generally outperform those that aren't consumer-orient-

HEALTHIER RICE The idea of a second gen-eration of GM products— the kind that could hold

the kind that could hold real appeal to consumers— is now gaining momentum. Earlier this year, the Ca-nadian government ap-proved the sale of a vita-min-fortified golden rice that contains higher levels of Vitamin A. It's potentially beneficial to those consumbeneficial to those consum-ers who may suffer from Vi-tamin A deficiencies.

Nonetheless, promoting direct consumer benefits is

direct consumer benefits is not a total panacea. Even while successfully showing consumers how GM foods can benefit them GM toods can benefit them personally, there were still a substantial portion of the participants in our study (35 per cent to 50 per cent, depending on the products presented) who refuse to purchase GM foods no mat-ier the price

ter the price. This indicates that con-sumer acceptance of GM foods is a complicated mat-ter. There's still a long road ahead to convince shoppers at the grocery stores to conat the grocery stores to con-sider genetically modified foods as personally beneficial

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U of S studies effects of playtime for piglets

BY NICOLA SCHAEFER

It's playtime for piglets at the Prairie Swine Centre (PSC), where Western College of Veterinary Medicine (WCVM) researcher Dr. Yolande Seddon hopes to find with whether piglets that play are better able to cope with life's stresses

Animals play only in the absence of stress, pain and fear, says Seddon, an assistant professor in swine behav-iour and welfare at the WCVM. Additionally, play has a

iour and welfare at the WCVM. Additionally, play has a critical role in the behavioural development, influencing learning, development of socials skills and motor skills. It is also hypothesised that play could be a source of pleasure, reinforcing performance of this behaviour. "If we can find out that [play] benefits the behavioural development, physiology and the mental state of the pigs, then there is a strong basis to try and offer opportunities for play in modern production systems to promote good pig welfare," says Seddon, who also holds the Natural Sciences and Engineering Research Council of Canada's Industrial Research Chair in swine welfare. Seddon believes that enriching piglets' environment will do far more for them than relieve boredom. It may set them up with beneficial skills and help them through

Will do far more for them than relieve boredom. It may set them up with beneficial skills and help them through the most stressful period of their lives. At weaning for ex-ample, piglets are separated from their mother, changed from a liquid to a solid diet, moved to a new location, and then required to live with piglets that are from other littore

All of this change can lead to health issues for pigs such as digestive problems and /or a drop in body weight. Sed-don hopes her play research may help piglets better ad-just, reducing stress for piglets and the medications used to support them.

"The pig's immune system is also developing at that point," says Seddon. "And it's the period of time when antibiotics are frequently required in pig production to control health disease outbreaks."

control health disease outbreaks." If Seddon's team finds evidence that playing improves pig welfare, using methods that producers could eas-ily adopt could lead to real opportunities for enhancing pig welfare in existing production systems. Science has already shown that more space and interesting environ-ments are good for pigs, but to help improve health and hygiene, pigs are still largely raised in barren environ-ments.

Seddon explains the challenge of simply providing ex-

Seddon explains the challenge of simply providing ex-tra space in an industry with fluctuating hog prices. "Space is very expensive. If you're going to provide more space within an existing barn footprint, you're go-ing to put less pigs through, and can you make the financ-es work?" she asks. That's why the preliminary play studies by Seddon are identifying how important extra space is to promote play, or whether play can be promoted through modifying use of existing eno space

or whether play can be promoted through modifying use of existing pen space. Additionally, Seddon is investigating how providing opportunities for play periodically could enhance any beneficial effects. "It's the fact that [the pigs] are getting it periodically that makes it a more exciting event ... and that is some-thing that can likely work in a production unit," she says. Funded by an undergraduate student research award from the University of Saskatchewan, a research team worked last summer to answer the initial question: what simple adjustments are needed for pielets to play more in simple adjustments are needed for piglets to play more in a standard production environment?

simple adjustments are needed for piglets to play more in a standard production environment? The team made simple modifications to the environ-ment of a group of piglets at the Prairie Swine Centre, giving them periodic access to a few square feet of extra space or to a tunnel inside their pen for 30 minutes a day (modifying the use of existing pen space). Then they com-pared how much these piglets played to piglets raised without these treatments. "We're comparing the treatments ... one where [the piglets] are having space outside the pen, and one where we're trying to get [them] to use the existing pen space. differently," says Seddon. "They're all probably going to stimulate different types of play ... provision of extra space we know is going to stimulate more locomotive play, but how does it alter social play?" Seddon suspects the piglets will use the tunnel to hide and chase each other through, which may improve their social development—an idea she developed having ob-served piglets using a pop-hole in a farrowing pen to play through.

through

through. When pigs have experience with extra space or a tun-nel, they have had greater exposure to new life experi-ences, and this can drastically alter their development. If the research can show that play will benefit the wel-fare of pigs and their productivity, Seddon says this will have big implications for the barns of the future, which may have opportunities for play built right in.



'We need to develop production systems that meet economic, environ-mental and animal welfare sustain-ably ... I personally think the impact play could have is huge," she says.

Nicola Schaefer is a second-year vet-erinary student at the Western College of Veterinary Medicine. She is originally from Winnipeg, Man. Her story is part of a series of articles written by WCVM summer research students.

Piglets enjoy some play time at the U of S Prairie Swine Centre.



Photo by Christina Weese





Saskatchewan Pulse Growers Invests in research

Saskatchewan Pulse Growers (SPG) has invested nearly \$1.5 million into pulse research projects that are looking to improve productivity and reduce threats to pulse crop production, as well as projects that will help to build new market demand for pulses. Under the recently announced Canadian Agricultural Protection (CANDA carGoinerge Colusten encourse)

Under the recently announced Canadian Agricultural Partnership (CAP) AgriScience Cluster program, SPG will be leveraging their grower dollar investment with \$8.7 million of Government and other industry partner funding.

funding, "SPG would like to recognize Agriculture and Agri-Food Canada for their continued investment into pulse research," says Corey Loessin, Chair of Saskatchewan Pulse Growers and Radisson area pulse farmer. "By leveraging Saskatchewan grower dollars with government and industry partner funding through the CAP AgriScience Cluster program, we are able to ensure that our investments into research go further to addressing the production and market challenges that are facing our industry."

the production and market challenges that are facing our industry." Industry partners on the Pulse Science Cluster include Alberta Pulse Growers, Manitoba Pulse and Soybean Growers, Ontario Bean Growers, and Pulse Canada. Projects funded under the Pulse Science Cluster are

Projects funded under the Pulse Science Cluster are seeking to make advancements in critical areas for the pulse industry, including a project that will utilize breeding and agronomic management practices to mitigate the yield loss in peas due to root rot. Another project will help build new demand for Canadian pulses in the pet food market, as the industry is working to diversify demand for pulses.

for pulses. "Research that will increase on-farm productivity and reduce agronomic challenges is a top priority for SPG,"



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says Loessin. "We are also targeting our research investments into projects that will build new demand for Canadian pulses. The recent loss of market access in India, our largest market, demonstrates the importance of continuing to diversify market demand to ensure that we are not

as reliant on any one market for pulse trade in the future." The total value of research included under the five-year Pulse AgriScience Cluster is over \$18 million, with \$11.1 million coming from the CAP AgriScience Cluster program.



Endless Sky has received a large amount of positive feedback and attention from RM 61, the town of Redvers and surrounding communities.

We are excited to announce that we have worked hard as a team in raising funds to be able to move forward with the construction of a CBD Extraction Facility in the community.

We are expecting to start our production in Redvers CBD Extraction Facility in Fall of 2019.

We would like to invite all members of the communities to our Presentation on Wednesday, October 3rd at 7:30 pm

for information about Hemp Farming and the Extraction facility. It will be held at the Golden Age Center on Main Street in Redvers Sask.

On October 4, 2018 we will be at the Golden Age center all day for any questions or help needed to subscribe for shares in Endless Sky Incorporated.

Any questions or to RSVP please contact Tannis@endlesssky.ca 403-978-3965

Marc Dumaine Endless Sky Inc Business Development, Western Canada

Growth through partnership.

Monday, September 24, 2018

U of S crop scientists help crack the wheat genome code

A University of Saskatchewan led research team has played a key role in an international discovery that will have an impact on the food security of millions of people around the world—the sequencing of the billion-piece jigsaw puzzle that is the bread wheat genome. The journal Science published the highest quality ge-nome sequence produced to date for the bread wheat variety Chinese Spring. This was long considered an al-most impossible task—the wheat genome is five times larger than the human genome and more complex— but also a critically important one in an era of climate change. Wheat is the world's most widely cultivated troughout the world. To the past 13 years, more than 200 scientists from 73 research institutions in 20 countries have been endeav-ouring, through the International Wheat Genome Se-quencing Consortium (IWGSC), to complete the genome sequence for bread wheat and make publicly available

sequence for bread wheat and make publicly available the new genomic assembly for breeders seeking to de-

welop improved varieties. "With funding from a range of partners and cutting-edge sequencing technology from our industrial partner NRGene, our research team at the U of S played a key role in the international consortium's success, a discovery that has the potential for disruptive innovation in wheat improvement," said Curtis Pozniak, researcher and wheat breeder at the Crop Development Centre in the U of S College of Agriculture and Bioresources. "Essentially we have completed the wheat genome jig-

saw puzzle with all the pieces put together in their cor-rect positions and order, providing an enormous advan-tage for breeders when searching for genes that control important traits in the crop," said Pozniak. "This break-through research will help produce better wheat varieties "

through research will help produce better wheat varieties over the long term." Pozniak leads Canada's contribution to the IWGSC-led wheat genome initiative through the Canadian Triticum Applied Genomics (CTAG2) project, which also includes scientists from the National Research Council, Agricul-ture and Agri-Food Canada (AAFC), the University of Guelph, and the University of Regina. "The new genome assembly provides a chromosome-by-chromosome representation rather than the fractured picture available previously and will elevate wheat re-search and breeding to a level equal to, or even better than, other major crops," said Andrew Sharpe, director of Genomics and Bioinformatics at the U of S Global Insti-tute for Food Security (GIFS) and co-lead for the CTAG2 tute for Food Security (GIFS) and co-lead for the CTAG2



Curtis Pozniak

AAFC wheat breeder Richard Cuthbert said, "Breeders will now have the information they need to identify economically important traits more rapidly, which will better enable development of wheat varieties with in-creases in yield, enhanced grain quality, improvements in disease resistance and more resilient to environmental stresses. The result will be more nutritious grain that can be grown more effectively and efficiently in harsher climates

In Canada, wheat accounts for more than \$4.5 billion in annual sales and, when value-added processing is fac-tored in, contributes more than \$11 billion each year to the Canadian economy.

With the world's population expected to reach 9.6 bil-lion by 2050, Maurice Moloney, executive-director of GIFS at the U of S, said this discovery will have a major

GIFS at the U of S, said this discovery will have a major impact on global food security. "In light of climate change, water shortages and limi-tations on the availability of arable land, we will need to rely on plant genetics to increase wheat productivity," said Moloney. "Solving the massive puzzle of the wheat genome will go a long way towards accomplishing that, similar to the growth that was made in maize and rice crops after their reference sequences were assembled." U of S Vice-President Research Karen Chad said ag-

riculture is a signature area of U of S research and the discovery highlights the importance of international re-

"No single researcher, university or country can solve global challenges like global food security," she said. "Working together with our international partners, our scientists are now better able to understand the complex set of genetic instructions encoded in wheat DNA, and breeders around the world will soon have the tools they need for crop innovations that will advance global food security'

The new sequence produced using NRGene's technol-ogy was the backbone of the IWGSC genome assembly. This work was funded by Genome Canada, Genome Prairie, Western Grains Research Foundation, Saskatchewan Ministry of Agriculture via the CTAG2 project, the Saskatchewan Wheat Development Commission, the Al-berta Wheat Commission, and the Canada First Research Excellence Fund through the Designing Crops for Global Food Security initiative at the U of S.

A number of international partners also contributed to the effort, including researchers at IPK Gatersleben in Germany, Kansas State University in the U.S., Tel Aviv

Germany, Kansas State University in the U.S., Tel Aviv University in Israel, and Illumina Inc. "With the support of the University of Saskatchewan and its Global Institute for Food Security, NRGene de-livered the assembly of the whole genome from start to finish in just three months, a remarkable computational feat given the complexity of the wheat genome," said NRGene CEO Gil Ronen. The Science article is entitled Shifting the limite in

The Science article is entitled Shifting the limits in wheat research and breeding using a fully annotated ref-

The U of S-led team also contributed to a second re-lated Science article led by the U.K.-based John Innes Centre and published Aug. 16th entitled The transcrip-tional landscape of polyploid wheat that describes the repertoire of expressed genes in the new wheat genome The next step for the U of S team will be to initiate a

larger-scale international initiative to sequence the more than 10 cultivated wheat varieties from the main growing areas across the globe. The 10+ Wheat Genomes Project, started last year and led by Pozniak, is using the same NRGene technology to sequence the genomes. Sequenc-ing for several varieties is already complete. More infor-mation can be found at: www.10wheatgenomes.com.

Produced by Research Profile and Impact Unit.





C18

Depressed on the farm

BY AMANDA STEVENSON

It's a bleak harvest season on Sean Stan-ford's farm south of Lethbridge, where just three inches of rain has fallen since the first of May.

Like many farmers in southern Alberta, Like many farmers in southern Alberta, the 34-year-old Stanford had high hopes for his crop at the start of the year. But by mid-June the rains had stopped coming and his spring wheat, canola, flax and yellow peak baked in the dried-out fields. Now, it's time to get the crop off, but Stanford already knows there will be no great payoff once it's in the bin it's in the bin.

"The yields are not looking good," said Stanford. "Basically we've just seen a whole year's worth of work erode away because of something we can't control."

The near round-the-clock workload combined with the prospect of negative re-turns can make harvest a challenging time for any farmer. But for Stanford, who was diagnosed with anxiety almost two years ago, the mental health risks are real. When the negative feelings start to take hold, he makes a conscious choice to get off the com-bine and seek human contact.

"Taking breaks—something as simple as taking a grain sample to town and talk-ing to the people at the grain elevator—can be enough to reset my mind and take me be enough to reset my mind and take me out of the monotony of combining a hor-rible crop," he said. "And I make sure that I make phone calls throughout the day and talk to different people. It's a distraction from what's going on." Stanford is an outlier among his peers, in that he has chosen to be open about his struggles with mental health. A University of Coulebb study in 2016

A University of Guelph study in 2016 found farmers are among the most vulner-able groups when it comes to mental health, reporting higher levels of stress, depression, emotional exhaustion and burnout than the general population. The same study found 40 per cent of ag-

ricultural producers would feel uneasy get-ting professional help due to the stigma that exists around the issue. "I was afraid to talk about it, when I first

"I was atraid to talk about 1, wnen 1 ms-got my diagnosis, but as time went on I started to realize, 'hey, I'm not alone,' " said Stanford, who tried three different medica-tions before finding one that helped to con-trol his symptoms, which he describes as a physical feeling, like "having a heart attack or a stroke or an aneurysm." or a stroke or an aneurvsm

or a stroke or an aneurysm. " "Farmers are supposed to be strong, inde-pendent, salt of the earth people who don't need help from anybody," he said, adding he has also found seeing a therapist helpful. "But the more I started to talk about it, the better I felt about it and the easier it was to start healing." start healing."

THE STRESSES 'ARE HUGE, AND SO VARIABLE' There are not a lot of statistics available about the mental well-being of farmers. A widely-cited study from the U.S. Centre for Disease Control reported the "farming, for-estry and fishing" industry had the highest rate of suicide of any occupation, but that study has reportly how withdrawn due to study has recently been withdrawn due to errors in the data. In Canada, suicides aren't

Tacked by occupation. However, Andria Jones-Bitton, the Uni-versity of Guelph professor behind the 2016 survey that polled more than 1,100 Canadian farmers nationwide, said the re-Canadian families nationwide, said the re-sults of her work point to a definite prob-lem. According to the survey, 45 per cent of Canadian farmers polled had high stress, another 58 per cent were classified with varying levels of anxiety, and 35 per cent experienced depression. An additional 38 per cent hed high levels of "amotional one per cent had high levels of "emotional ex-haustion."

Iones-Bitton said there are a number of mental health risk factors associated with mental neatth risk factors associated with agriculture. Farmers work long hours, of-ten in isolation. They are under significant financial pressure, often required to take on millions of dollars' worth of debt just to purchase the land and equipment required to operate. And in most cases, a farmer's place of business is also his or her home, meaning there is no easy way to separate from the workload. Sean Stanford says he needs distractions to take his mind off "the monotony of com-

bining a horrible crop." In addition, farmers are constantly vul-

nerable to unusual events and circumstances that can impact their bottom line—from weather and natural disasters to interna-

some producers in the University of Guelph survey even reported increased



Sean Stanford farms near Magrath in southern Alberta

stress due to the heightened public scru-tiny around agricultural practices. Anti-meat and anti-GMO consumers often attack mainstream agricultural practices on social media, leading some farmers to feel their industry and way of life is under attack, Jones-Bitton said. "If you look at some of the stresses that

"If you look at some of the stresses that farmers face, they're just huge, and so vari-able," Jones-Bitton said. "So many of the stresses they're experiencing in their jobs are outside of their control, and that leads to a sense of hopelessness and helplessness — which increases their risk for negative mental health outcomes."

> 'Us cowboys, we like to THINK WE'RE PRETTY TOUGH'

Brad Osadzcuk knows only too well how a farmer can be knocked off his feet by an unexpected event.

In 2016, Osadzcuk's ranch near Jenner, Alta., was "ground zero" for a bovine tu-berculosis scare, after a case of the disease was found in a cow traced back to his herd. The resulting months-long investigation by the Canadian Food Inspection Agency saw more than 50 ranches in southeast Alberta and southwest Saskatchewan placed un-der quarantine. As a precaution to keep the disease from spreading, nearly 12,000 ani-mals were ordered destroyed—including Osadzcuk's entire herd.

Osadzcuk's entire herd. "That TB thing was just a nightmare. It was by far the worst thing I've been through in my life, emotionally." Osadzcuk said. "I was relying on sleeping pills. I wasn't sleep-ing and I knew I had to get sleep, so I doped mrsel un " myself up." Osadzcuk said because the TB episode

affected his entire community, he tried at the time to keep a brave face for his friends and neighbours. He acknowledges part of the reason for that may have been the in-grained culture of farming, where stoicism is valued and where producers have tradi-tionally kept their problems to themselves. "Especially us cowboys, we like to think we're pretty tough," he said. "My dad's generation, you didn't show weakness. It would literally eat you up inside, and then one day you'd find out you had a neighbour who shot himself or hung himself, and no-body even knew there'd been a problem." Producers affected by the bovine TB out-break of 2016 ultimately received \$39 mil-lion in government compensation payouts, affected his entire community, he tried at

lion in government compensation payouts, but Osadzcuk said he knows of at least one producer in the Jenner area who had to check himself into the hospital for stressrelated health complications during the

related health complications during the height of the crisis. "You think you're going broke, you're stressed and depressed. You literally think you're going to lose your livelihood," he said. "It was an awful time."

'THE STRESS LEVEL IS QUITE HIGH' The mental health risks to farmers are amplified in a year like this one, where pro-ducers across the Prairies are dealing with ducers across the Prairies are dealing with the aftermath of prolonged hot and dry con-ditions. According to a federal government assessment, as of the end of August, large portions of southern Alberta are now con-sidered to be in "severe drought" (defined as abnormally dry conditions occurring on average every 10 to 20 years) while a small

area south and west of Medicine Hat is cate-gorized as in "extreme drought" (occurring once every 20 to 25 years). The Alberta government estimates that across the province, crop yields are six per

cent below the five-year average, but 27 per cent below average in the hard-hit southern region. While some regions received rain and even snow this week, moisture during the height of harvest is a hindrance, not a belo

help. The poor weather conditions have meant financial stress and mental worry not just for grain, cereal and oilseed farmers, but for cattle producers as well. According to the cattle producers as well. According to the Alberta government's Aug. 28 crop report, 36 per cent of the province's pasture land is rated in "poor" condition and in some regions that figure climbs to nearly 60 per cent. Cattle are getting thin and producers whose grazing land has dried up are strug-gling to source feed from elsewhere. In some areas, according to Alberta Beef Producers chair Charlie Christie, the price of hay has nearly doubled from a year earli-er. Many ranchers are beine forced to make

er. Many ranchers are being forced to make tough decisions—including selling off cows to feedlots prematurely because they know they won't be able to feed them over the

"In the areas that are hurt the most, the stress level is quite high ... Some guys are liquidating 20, 30 per cent of their herd," Christie said.

At a recent Alberta Beef Producers board meeting, members discussed the toll that a drought like this can take on ranchers' wellbeing, While—in general—agricultural pro-ducers are becoming more open about talk-ing about mental health, Christie said his organization is well aware that some ranch-

organization is well aware that some ranch-ers may be suffering in silence right now. "Depending on what kind of genetics you're using, it can take 10 to 20 years to build a cow herd and feel really comfort-able and good about it," Christie said. "If you have to liquidate it, it's part of your life ... so we're definitely looking at that (the

mental health aspect) and moving forward to see what more we can do there

NEW FOUNDATION OFFERS

MENTAL HEALTH TRAINING For farmers experiencing any form of For farmers experiencing any form of mental distress, there are a number of fac-tors standing in the way of getting help. Even those who are able to get past the stiff upper lip mentality that is prevalent in the industry may have difficulty finding coun-sellors or therapists in rural areas. And the demands of harvest or caring for livestock may make it impossible to take time off to travel into the city for appointments. That's part of the reason behind the 2017 launch of Do More Agriculture, a not-for-profit foundation that aims to create aware-ness about mental health on the farm and build a community of support and resourc

build a community of support and resourc-es for those affected.

es for those affectéd. Co-founder Lesley Kelly, who lives and Go-founder Lesley Kelly, who lives and farms with her family east of Saskaton, said the foundation has launched a pilot project that will provide 10 to 12 rural Ca-nadian communities with mental health first aid training at no cost. Similar to tradi-tional first aid in that it is meant to be used in mercreacies until appropriate support is in emergencies until appropriate support is found, mental health first aid refers to in-the-moment help for individuals dealing with an urgent mental health problem of

"I like to explain it as, if I were to sprain my ankle, most people would know in that instant what to do," Kelly said. "But if I were to have a panic attack, chances are people would not know what to do." Last July, Kelly and her husband, Ma-

Last july keily and ner nusband, whi-thieu, did an internet live-stream sharing their own mental health struggles—hers with the "baby blues" following the birth of the couple's second child, and his with anxiety related to farm and financial stress. She said the response to that video showed her just how hungry the agriculture community is to have a real conversation about

munity is to have a real conversation about mental health. "Our phones just lit up with people say-ing, 'This is me. This is what I've been go-ing through,' " she said. "It was a huge eye-opener to me."

Do More Agriculture is also trying to keep the conversation going on social me-dia, since many farmers work in isolation day-to-day but are able to connect with peers on Twitter.

"You really do think you're alone, that ev-eryone else is perfect and lives normal lives, and that's totally not the case," Kelly said.

Back on his Lethbridge-area farm, Sean Stanford knows he will need to keep an eye on his own mental health not just for this harvest season, but likely for the rest of his

life. "I know how to manage it (the anxiety) a lot better now, but it's still there," he said. 'It's not really anything that will ever go away

However, Stanford said he has drawn However, Stanford said he has drawn strength from sharing his story, and the hope that other farmers will see his happy-go-lucky exterior doesn't always reflect what is going on inside. "Maybe other people can look at me and say, 'hey, he looked like he had his sh*t to-gether, but he actually doesn't." Stanford said. "And maybe that's ok."



Monday, September 24, 2018

CCA concerned with uncertainty around NAFTA

Uncertainty remains around the North American Free Trade Agreement (NAFTA) renegotiations, with significant turbulence framing the latest round of talks led by the U.S., and the Canadian Cattlemen's Asso-

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U.S., and the Canadian Cattlemen's Asso-ciation is expressing concern. The Canada-U.S. talks resumed in Sep-tember following the elections in Mexico, which led to a change in government there which will occur in early December, and later still the announcement of a prelimi-nary bilateral deal between Mexico and the US

The CCA was in Washington D.C. to monitor the resumption of the Canada-Monitor the resumption or the Canada-U.S. NAFTA renegotiations. Negotiators appeared to be focussed on getting a deal done, with Foreign Affairs Minister Chrys-tia Freeland and U.S. Trade Representative (USTR) Robert Lighthizer holding a number of meetings with a few senior officials accompanying them.

Trade representatives discussed the full range of issues, including agriculture. There is a general sense that the process is constructive, and Minister Freeland has said as much.

Overall, CCA says it is cautiously op-timistic that there will be a trilateral deal including Canada, once a Canada-U.S. "handshake" occurs, then Mexico will re-join for negotiations to continue trilaterallv

The CCA and other red meat groups continue to press for improvements through the NAFTA renegotiation on reg-ulatory issues, advocating for a "meat annex" of provisions to remove burdens and smooth trade.

Regarding the retaliatory tariffs applied

by Canada on July 1 on products, includ-ing some prepared foods that have beef as an ingredient, CCA continues advocacy work with Canadian officials and U.S allies seeks to avoid further escalation of these tit for tat tariff measures and find a path forward on NAFTA

path forward on NAF1A. Meanwhile, it is widely expected that the Government of Canada will move swiftly to ratify the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) as the fall session gets under way. Bill C79 to implement the CPTPP, re

ceived second reading on September 17, the first day of sitting following the summer break.

Canada must be among the first six countries to ratify the landmark CPTPP if Canada's beef and red meat and agricultural sectors are to have a leg up on com-petitors, according to the CCA.

The Government of Canada has given the right signals that it understands the

inportance of Canada being one of the first six to ratify. The CPTPP will start to come into force once six of the 11 signatories complete their domestic ratification procedures.

In July, Singapore became the third country to ratify the agreement, behind Mexico and Japan. Time is of the essence for Canada.

for Canada. The Canadian Agri-Food Trade Alliance (CAFTA), of which CCA is a member, is-sued an open letter to the Prime Minister and party leaders reiterating the impor-tance of Canada being among the first six countries to ratify and implement the CPTPP.

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University of Saskatchewan crop scientist Curtis Pozniak,



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Wheat genome blueprint accelerates innovation

BY SARATH PEIRIS

BY SARATH PEIRIS Breakthrough research in creating a comprehensive blueprint of the wheat genome will bring disruptive in-novation to wheat breeding, predicts University of Sas-katchewan crop scientist Curtis Pozniak, whose team played a key role in the successful international wheat genomics project. "The wheat blueprint will enable us to decipher the ge-relic heat of immortant traits in whost curbs a concern

"The wheat blueprint will enable us to decipher the ge-metic basis of important traits in wheat, such as genes re-sponsible for resistance to fungal diseases and pests. That is the disruptive part. What took years to do before can now be done in a matter of a few weeks," said Pozniak, a wheat breeder at the Crop Development Centre (CDC) in the U of S College of Agriculture and Bioresources. New knowledge generated by the International Wheat Genome Sequencing Consortium over the past 13 years is expected to have a huge impact on global food secu-rity, with the planet's population projected to reach 9.6 billion within three decades. The findings were published recently in the journal Science. "From a breeding perspective, the blueprint will enable us to develop DNA markers for breeding. These mark-ers will allow us to improve the efficiency of selecting im-portant traits, which will ultimately help produce better wheat varieties over the long term," Pozniak said. The next step for the U of S team will be to lead the 10+ Wheat Genome Project—a larger-scale international in-itative to sequence more than 10 cultivated wheat variet-ies from the main growing areas across the globe.

ies from the main growing areas across the globe. "We are very excited about this project. The idea is not use just one genome sequence, but make a comparative analysis of many sequences simultaneously." Pozniak said. "To understand what genes do in wheat plants, you need multiple sequences so you can start comparing to really appreciate all of the differences. You can then as-sociate these differences with important traits we select in

breeding programs." The genome structure mapped out for the Chinese Spring line will serve as a useful reference in developing new wheat varieties that have traits to resist diseases and

pests as well as varied growing environments, he said. Andrew Sharpe, director of genomics and bioinformat-ics at the U of S Global Institute for Food Security and It is a fife 0 of block in the wheat genomics research, is also excited that the new project will yield a lot of data on genomic variation that will help the agriculture industry

genomic variation that will help the agriculture industry respond to environmental changes. "We're hoping to work out all the different gene varia-tions that could have an impact on traits," Sharpe said. "Basically, we will end up with a catalogue of variation and how it impacts a crop in the field." He expects this catalogue of genomic information to be available by fall of next year. "This resurces will have immediate application in the

"This resource will have immediate application in the wheat breeding program at the CDC, where we will see the impact over the next few years," Sharpe said. Because the CDC has been involved from the beginning of the wheat genome project, researchers here have the begint to the the the prover prediction are the information.

benefit of a two- to three-year early access to the information, he said.

'You will see that reflected in the new varieties that ul-"You will see that reflected in the new varieties that ul-timately come out of the breeding pipeline," Sharpe said. "By helping with selecting the most optimal plants in a breeding cycle, you end up with better performing culti-vars being generated quicker than they were. That's im-portant, particularly in a changing climate," said Sharpe. Kirby Nilsen, a recent U of S PhD graduate and now an assistant plant breeder at CDC, is among the first re-searchers worldwide to use the blueprint to develop pest-resistant wheat crops. He used the genome sequence to identify genes responsible for solid wheat stems, which act as a barrier to sawfly damage.



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Monday, September 24 • Page C25

2018 harvest mostly in the bin

Most of the 2018 harvest is in the bin in Southeast Saskatchewan and Southwest Manitoba and local farmers are happy with the harvest; 84 per cent of the crop is in the bin in Southeast Saskatchewan according to the Sept. 20 crop report.

Some areas in the region were able to get a few more days on the combines before rain showers rolled in again by the weekend. Eighty-four per cent of the crop is in the bin, up from 77 per cent last week. The five-year average (2013-2017) is 63 per cent combined. Overall, crop quality is good. There are large variations in yield over very short distances between fields, which is mainly due to variants in growing season rainfall. Many producers have finished harvest; however, there are still fields of flax, soybean and canola left to combine in some areas. The Carnduff area re-

The Carnduff area received 13 mm of rain, the Tantallon area 12 mm, the Grenfell area 17 mm, the Weyburn area 8 mm, the Wilcox area 9 mm and the Radville area 6 mm. Continued on Page C27 ☞



Ali Kowaluk took this harvest photo on Sept. 12 as part of the World-Spectator's Harvest Photo Contest. The photo was taken between Moosomin and Rocanville.

Dr. Robert Kitchen, MP Souris-Moose Mountain

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Local farmers pleased with yields, quality

** Continued from page C25 The Lampman area maintains the re-cord (419 mm) for rain in the region since April 1. The lack of rain in some parts of April 1: The laves many pastures and hay land in need of significant moisture. Cattle have been moved home or are being fed in pastures. There are reports of significantly more straw baled to help with feed shortages.

ages. Topsoil moisture on cropland is rated as 12 per cent adequate, 45 per cent short and 43 per cent very short. Hay land and pas-ture topsoil moisture is rated as five per cent adequate, 32 per cent short and 63 per cent very short. Crop District 2A is report-ing that 70 per cent of cropland and 78 per cent of hay land and pasture remains very short of topsoil moisture at this time. Limited rain during the growing season has put some grazine pressure on pastures

has put some grazing pressure on pastures in the region. Fourteen per cent of the pas-tures in the region are in fair condition go-ing in to the winter months, 40 per cent are rated as poor and 46 per cent are rated as very poor. The majority of crop damage this past week is due to lack of moisture. There are

week is due to lack of moisture. There are still concerns regarding the lack of feed and grass fire risk in many parts of the re-gion. Winter cereal acres are expected to decrease due to dry field conditions. Matt Ross is an agronomist with Lincoln Farm Supply. He says farmers were very pleased with crops in Southeast Saskatch-ewan and Southwest Manitoba this year. "I would say that the majority of wheat crop around here was excellent quality, and they had very good yields," he says. "The canola was very similar to last year. There is still some of the crop out, but I would call them above average yields

I would call them above average yields and very similar to last year's crop.

"I would say that most guys are quite happy for the amount of moisture they

"For some of the limited moisture that was received in areas there, the crops were surprisingly good. I haven't talked to any-body who wasn't happy with their crops." Ross says the only snag that farmers hit in this region was moisture delaying the canola and soybean harvest.

canola and soybean harvest. "There is probably still 20-25 percent of the crop out, primarily canola and soy beans. In some areas they are probably 90-plus per cent done harvest, and some ar-eas they are around 65-70 per cent done." Craig Roy farms near Moosomin and says all their crops graded at a number one this year

"We were really happy with it," he says. "It was above average, which was surpris-

Roy planted wheat, canola and winter wheat. Both wheat and canola gave high yields and high quality. "Just the dry weather saved the qual-

ity, and somehow it found the moisture to produce above average," he says of the wheat. "I don't know where it found the moisture. I thought we used all the reserve moisture up last year but somehow it found some more. "There were really high bushel weights

in the wheat, which helps the yield when

"The canola was better than I thought it would with the late heat. When it was flowering and later in the year I thought we'd be average at best. I thought we'd be below average and we ended up above av-

erage on the yield. "It takes a lot to downgrade canola. It wasn't as heavy weight-wise as it was "All the grain was grading at number one."



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C27

The next generation of farmers

The oil. Where could the cooking oil be? I mean, really, how could I possibly misplace it? It was day 15 or maybe 22 of harvest (they tend to run together) and I was once again in a mad rush to get supper for 10 out to the field.

The pototoes were cut for home made french fries but Ine pototoes were cut for nome made french fries but the oil was nowhere to be found. I sometimes misplace my car keys, yes, but the oil? How can you misplace your oil? My daughter-in-law had no idea where it was. My daughter hadn't borrowed it.

My daughter hadn't borrowed it. It had vanished. In my hurry, I grabbed some flavoured olive oil and made do with what I had. Later that evening I was com-bining with the twins (now seven) and I was still won-dering about where the heck the oil had gone when I said, "I wonder where my canola oil is," And wonder of wonders, I hear, "We know where it is!" "Where? Where is the oil?" I asked them, expecting a clear and concise answer. Their response, yet again was, "We know where it is." I went home late that night still not knowing where

I went home late that night still not knowing where the oil was.

The next night, deja vu, my sidekicks were back in the combine with me and I once again asked them about the oil.

"In the spare bedroom," one replied. I needed more "In the spare bedroom," one replied. I needed more specifics so I asked them to expand on that. The other one said, "Under the dresser!" with the underlying senti-ment not spoken, but implied, "Where else would it be?" What I didn't know (since I had been away during the

September long weekend) was that the kids had been at my house playing 'store' over the weekend. Well not only was there oil under the dresser, but an

expansive supply of dry goods that belonged in the pan-

I couldn't help but wonder what kind of store would keep their groceries on the floor under the bottom shelf but I didn't even ask.

but I didn't even ask. I will know however, where to look for the oil next time. And pray the lid is on tight! Despite the crazy, busy time of year that it is for grain farmers, it's also the most fabulous time of year! The sunsets are beyond compare, the wheat is this amazing shade of gold and the combines are rolling along all around us. Of course there are the inevitable combine break downe that weak howe are our places for the downend

downs that wreak havoc on our plans for the day and



the glamour of the season meets reality head on more often than no

I was thinking that after my 'stone meets header au-ger' moment (or was that a rock?) a couple of years ago, that the guys had forgotten all about it, but wouldn't you know, someone had to say how nice it is to drive a combine with a perfectly smooth header auger (not ours obviously). How rude!

I write this column late at night after a full day on the combine. I have concluded that looking for a half ton truck in the dark is somewhat like looking for a needle I have had three additional pairs of eyes helping me

and telling me which way to go. Finally one of the twins says, "If I was driving, Grandma," ... pause ... "I wouldn't have a clue which way to go!" Not so helpful after all. At any given time, the twins know exactly which com-bine their dad is driving and which one Grandpa is driv-

They both look the same to me.

Green, basically. As we go back and forth (for hours and hours), they talk about roosters, hogs and goats.

They would like to get some. Roosters. Hogs. Goats. They really would especially like to be able to 'slop the

hogs.' It only costs \$80, they tell me, to get a hog. And if it's pregnant it could have babies and they would have lots of hogs to slop. "How much would a rooster cost," they ask me.

Of course, all things animal are out of my league, al-though I tell them I did have a goat once.

though I tell them I did have a goat once. I suggest they get goats. But, I tell them, Grandpa will park his machinery next door, far, far away, if they get goats. And maybe never go out to the farm in the car—ever! They think goats climbing on the vehicles would be the best part of having goats! One of our discussions this harvest centred on which combines would be theirs when they get big

combines would be theirs when they get big. One is going to have the 9500, the other the 9600 some

What about Grandpa's combine?" I ask. "Who is going to get that one? The one with the slightly dented header auger?" "No one," they say. "Grandpa's going to keep driving that one forever." I'm thinking I may need to explain re-tirement to them one of these days. One night we were finishing up a field of canola a cou-ple of miles from home base.

The darkness and the dust that lingered made it a lit-tle dirkness and the dust that lingered made it a lit-tle difficult to see, but as the three combines made their way up and down the field, it was exciting (to me) to approach the 'end zone' and be able to park my machine for the night.

for the night. The guys headed over with the other two machines to another field to finish up there. The next day, my husband tells me I missed three rows on that field we had been working on the day before. Now, exactly where is the logic in that? How possibly could there be three operators combin-ing in one corner of the same field but only one (moi) missed three swaths Co figure

In the control of the same field but only one (not) missed three swaths. Go figure. As harvest winds down, leaving us only a couple of days left, I can't say I'll be sad to say we're done, but at the same time, I will look at the end of the season with a bit of nostalgia—after all, each harvest season has its own unique history—especially as seen through the eyes of the next generation's farmers!

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C28

Monday, September 24, 2018

How to fight desertification and drought at home and away

BY ANDREW SLAUGHTER A growing human popu-lation and runaway con-sumption are putting unsumption are putting un-sustainable pressures on the natural resources we depend on for survival. Our misuse and abuse of land and water is changing for the large direct direct of the survey

The word "deserts. The word "deserts. The word "deserts. The word "deserts. The vord "deserts. of the spread of existing deserts, with tall dunes spilling into villages and farmer's fields. But it is ac-tually a term that describes the way lead can be transthe way land can be trans-formed by climate varia-tion and human activities, including deforestation, overgrazing (which causes erosion) the cultivation of unsuitable land and other poor land-use management decisions. We see this now in south-

ern Africa, which has al-ready lost at least 25 per cent of its soil fertility.

Cent of its soil fertility. But not only developing countries are at risk. Al-most 1 billion tonnes of soil is lost every year because of erosion resulting from poor land management in Europe alone. Europe alone.

Desertification is one of the biggest environmental billion people. Given that climate Given that climate Given that climate

change could cause more frequent droughts and that frequent droughts and that population growth puts more pressure on natural resources, land degrada-tion is an increasing global threat to food security, a contributor to poverty and a barrier to achieving the United Nation's Sustain-ble Deurgement Code.

United Nation's Sustain-able Development Goals. It is clear that desertifica-tion is a problem of global proportions, requiring a unified strategy among all countries. If action is not taken now, desertification will accolerate resulting in will accelerate, resulting in further migration and con-flict.



The swollen Assiniboine River covers farmlan d west of Brandon, Man. in July 2014. In addition to drought, more flooding is also expected in the Prairies in the future.

Seeing the threat Not all areas are equally at risk of desertification. at risk of desertification. Drylands, like those in the Karoo of South Africa and the prairies of Canada, are regions where evapotrans-piration (the transfer of water from land and plants to the atmosphere) far ex-ceeds precipitation. Under natural condi-tions, drylands are char-acterised by slow cycles

acterised by slow cycles of changing climate and vegetation, moving from one stable state to another. More frequent and severe More frequent and severe droughts and human dis-turbances, such as agricul-ture, grazing and fire, cause more abrupt shifts that can be irreversible. The threat of land deg-radation is so widely rec-ognized that the UN es-tablished the Convention

tablished the Convention to Combat Desertification (UNCCD) nearly 25 years ago, in 1994. It is a legally binding agreement be-tween the partner nations to work together to achieve sustainable land management. All

All member countries of the UNCCD recently agreed to fight desertifica-tion and restore degraded land by 2030. On June 17, Ecuador hosted the World

Day to Combat Desertification, under the slogan "Land has true value – In-vest in it," and used the oc-casion to showcase the use of sustainable land management in developing the country's bio-economy.

A tentative pledge Despite its initial com-

Despite its initial com-mitment to combat deserti-fication, Canada withdrew from the UNCCD in 2013. The reasons were unclear, but it may have been bebut it may have been be-cause membership was seen as too costly, without obvious benefits for the environment. The depar-ture left Canada as the only country not party to the agreement.

agreement. However, Canada re-joined last year, acknowl-edging the link between desertification and many of Canada's development priorities. The factors driv-ing land degradation are interconnected and include interconnected and include population growth and mi-gration, climate change and biodiversity loss. Current rates of global land degradation are in the

order of 12 million hectares per year. And yet food production must increase up to 70 per cent by

CARE

2050 to feed the projected global population of 9.1 bil-lion people. Current landmanagement practices are clearly unsustainable. The threatened area is so

arge that halting land deg-radation and scaling up solutions—from farms and villages to watersheds and villages to watersheds and continents—requires glob-ally coordinated solutions. By rejoining the UNCCD Canada can take its right-ful place within a coordi-nated global effort to com-bat desertification—and strengthen its own efforts nationally. nationally.

Why Canada

why Canada should care Canada has already co-operated on a regional level with other countries to combat drought and to combat drought and minimize the impacts of re-duced agricultural produc-tivity, wildfires and water shortages. In 2016, for example, when droughts hounded North America, burning Fort McMurray, Alta. and adding to California's long-running water shortage,

running water shortage, Canada cooperated with the United States and Mexico to minimize their im-pacts. The resulting North

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American Climate Services Partnership (NACSP) facilitated an early drought fore-casting system and drought impact assessments.

Impact assessments. In addition, Canada faces its own land degradation challenges. Most people associate dryland regions with a hot and dry climate. with a hot and dry climate. However, large parts of the Canadian Prairie provinc-es—Alberta, Saskatchewan and Manitoba—can be clas-sified as drylands. They are also enormously important agricultural areas, account-

agricultural areas, account-ing for 60 per cent of the cropland and 80 per cent of the rangeland in Canada. The Prairies expect to see longer and more intense periods of drought inter-spersed with major flood-ing with future climate spersed with major flood-ing with future climate change. And although North America is one of five regions identified by the UN as facing relatively fewer challenges related to land compared to the coun-tries most at risk, the region does face significant water does face significant water stress challenges.

Way forward The Paris Agreement recognized "safeguarding food security" as an im-portant priority for climate change adaptation, which goes hand-in-hand with combating desertification. The agricultural sector will play an important role in mitizatine the impacts of in mitigating the impacts of

climate change-and fight-ing land degradation. It can protect against drought, flooding, landslides and erosion, while maintaining natural vegetation, which helps store carbon in the soil

But agricultural produc-tion will also have to become more efficient. It will need to adapt to periods of lower water availability and take measures to preserve fertile soil.

serve fertile soil. We must also look to how we manage our water re-sources to help agriculture adapt to climate change and stop desertification. The University of Sas-katchewan is currently de-valoring tools that can ba

katchewan is currently de-veloping tools that can be used by government and in research to predict and manage the water flow and water quality of Canada's large river basins. This will allow water to be managed at the scale of entire river at the scale of entire river have industry, agriculture and mining can fairly share this limited resource.

Canada has, for now, rec-ognized the link between desertification and many of its development priorities, including agriculture, secu-rity, water and renewable energy. But we need to en-sure the Canadian government remains committed to combating drought and desertification here—and in the rest of the world.

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PBY AIR



Monday, September 24, 2018

PAMI offers information to producers storing wet grain

Given the recent and widespread rain, snow, and cool temperatures experienced across the grain belt, Prairie Agricultural Machinery Institute (PAMI) is reminding producers of a number of recommenda-tions to help them minimize the risk of spoilage of wet grain stored in bins. "We know producers are very concerned about the mojsture content of their crons

about the moisture content of their crops going into the bin," said Dr. Joy Agnew, project manager of Agricultural Research Services at PAMI. "This has been an area of much research at PAMI and although or much research at PAMI and although some of our multi-year projects are still ongoing, the data we have already collect-ed on the use of heat in grain drying can be used by producers to minimize losses in wet years like this."

Adding supplemental heat to natural air drying involves two basic steps, she said. The first is to use the heat to draw moisture out of the grain and into the air that is in the pockets between kernels, and then use moderate airflow rates to move that moist air out of the bin.

"A lot of our research has centered on A lot of our research has centered on wheat and canola but the physics ap-ply across the board to any crop," said Agnew. "For every 10° C you can increase the temperature of the air going into the bin, you cut the relative humidity in half. That means you can turn a cold, miserable, drizzly day into perfect drying weather."

The following are some basic recom-mendations for improving results and re-ducing risk when storing wet grain. 1. The air moving through the bin needs to be at least 10-15° C for optimal drying potential and should not exceed 20-30° C to avoid high grain temperatures that can

 2. Use a fan with an airflow rate of at least 0.75 cubic feet per minute (CFM) per bushel. Anything lower could result in heating of the grain, which can initiate spoilage. And, the higher the temperature increase of the air going into the bin, the more CFMs are required. With supplemental heating, hotter air is not necessar-



ilv better as you need to match your target don't know your fan capacity. If you don't know your fan capacity. If you don't know your fan capacity (CFM per bushel), go to pami.ca/storage to learn how to measure or estimate your airflow. 3. Ensure there is adocusted with the storage of the

3. Ensure there is adequate ventilation at the top of the bin to allow moist air to escape. That means one square foot of ventilation space per 1,000 CFM. Some bin and fan manufacturers are producing fans manifacture of the second specifically designed to move air out of the tops of bins. 4. Rotate the bin contents frequently

(every few days) by removing at least one-third from the bottom and auguring it

5. Monitor the conditions in the bin. Ideally, the moisture content should be monitored but, at a minimum, monitor the temperature in the bin. When using supplemental heat, the drying rate is con-siderably faster than with no heat, so keep a close eye on grain conditions to prevent

a close eye on grant continuous to prevent over-drying.
6. The size of the heater should be based on the desired temperature increase (which depends on the ambient tempera-ture and the target temperature) and the dependence from the for knowing in mind airflow rate from the fan, keeping in mind the minimum air flow rate of 0.75 CFM per bushel.

7. Consider investing in thermostatic controls for heaters. The more consistent the air temperature going into the bin, the more effective the drying will be.



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PAMI offers information to producers storing wet grain

8. Heat transfer efficiency is important. Properly de-signed systems that are appropriate for the bins and fans are best, and setting up the system properly is key to efficiency and effectiveness

9. The target temperatures mentioned above are valid

for the fall season but when the outside temperature drops below about -5° C, the temperature of air going into the bin should be reduced to prevent damp grain from freezing to the sides of the steel bin. 10. When the grain is almost dry, turn off the heat and



cool the grain to below 15° C. Cooling the grain will result

in some additional moisture removal (ranging from approximately 0.5% to 2%). In some additional moisture reinloval (tanging moin approximately 0.5% to 2%). Agnew cautioned producers to use care hooking up heating and electrical systems to grain bins as they pose potential safety risks. She also noted that the main dif-ference among the heating options (propane, natural gas, indirect hydronic, etc.) is operating cost and ease of use. Direct fired heating systems do add moisture to the air entering the bin, but the amount of water added is negli-gible compared to the water being removed from the bin. PAMI's on-going research on this topic will better de-fine the minimum airflow rates for use with supplemental heating, the drying rates with different target tempera-tures, and the energy efficiency and operating costs of dif-ferent supplemental heating systems. Interim results will be available in 2019 and the study wraps up in 2020. This research is funded by SaskWheat and SaskCanola. More information on crop storage can be found at pami.

More information on crop storage can be found at pami.





Foreign investment could boost Canada's exporting superpower

The Advisory Council on Economic Growth has established some far-reaching goals for Canada's agri-food system, suggesting moves from the world's 5th-largest to 3rd-largest ag exporter, and from the world's 11th-largest to 5th largest to 3rd-largest to 3rd-largest to 5th largest to 5th large 5th-largest food exporter, are possible. The Council also called for Canadian businesses' increased investment in foreign markets and welcoming more investment from foreign businesses to Canada.

Together, increased exports and foreign direct investment (FDI) can increase Canadian productivity, strengthen our labour force and contribute more to GDP. But the question for Canadian business

is whether these two goals are complemen-tary or should be treated as substitutes. If Canadian businesses invest domestically to

increase food exports, how can (or will) our FDI in food processing sectors grow simultaneously?

Why do we need foreign investment? wind to we need to regn investment: Canada's vast agricultural land coupled with a relatively small population makes exporting integral to a successful agri-food supply chain. Canada has reached its status as one the world's largest agri-food exporters thanks to the productivity gains needed to capitalize on the natural resources we have available.

Export performance is also tied to FDI. Ca-nadian investments abroad (outward FDI) can help to increase Canadian business rev-enue through affiliate sales in international markets, boosting the competitive strength of



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companies domestically. At the same time, foreign companies that invest in Canada (inward FDI) can often exinvest in Canada (inward FDI) can often ex-tend growth of Canadian exports to foreign markets that were previously inaccessible. They cement good trading relationships and bring knowledge that creates a highly-skilled Canadian labour force—all of which help to build the conditions on which growth in Can-ada's future export sales rely.

U.S. investments in

Canada's food processing slow Foreign investment in Canadian businesses takes one of two forms. Brownfield investors purchase an existing Canadian business. Greenfield investments help build or expand production capacity and can involve sizable infrastructure costs such as construction of new physical assets. They often bring greater benefits to the Canadian economy than do mergers and acquisitions.

Greenfield investment in Canada has grown and changed over the last 10 years. Between 2005 and 2007, it totaled US\$754M and averaged US\$34.3 million (M) per invest-

During this period, over half of total greenfield investment in Canada came from the U.S. A decade later however, U.S. investment had declined to 22%. This occurred after total LS. investments slowed and greenfield FDI from other countries picked up. Total green-field investments into Canada grew to US\$1.3 billion in the 2015-2017 period. Europe displaced the U.S. as Canada's larg-

estives to contributing more than half of all investments in Canada's food manufactur-ing sector between 2015 and 2017. That shift occurred on the heels of the free trade ne-gotiations between Canadian and European traders, finalized in the 2014 Comprehensive Economic and Trade Agreement (CETA). As European investments in Canadian proces-sors increased, Canadian exports to the EU averaged at least CA\$200 million more each year between 2015 and 2017 than in the 2005period.

With their economic growth prompting a search for business opportunities, Chinese investments in the Canadian food processing sector also increased significantly over that same period, growing to account for 20% of Canada's greenfield investment between 2015 and 2017. It's another example of the simultaneous growth of exports and FDI. Canadian food exports to China increased dramatically in that span, averaging CA\$40,000 between 2005 and 2007 and CA\$362M between 2015 and 2017 and 2017.

In the 10-year period during which Canadi-an greenfield investing has increased and its sources diversified, food manufacturing GDP in Canada has also grown—from an average annual rate of 2.1% to an average annual rate of 3.8%

As Canadian greenfield investing increased and its sources diversified, food manufactur-ing GDP in Canada grew from an average an-nual rate of 2.1% to 3.8%.

Consumer preferences shape

foreign investments Foreign investors have responded to Cana-dians' growing preference for healthier foods with greater greenfield investment since 2005 in the fruit and vegetable processing sector. Technological advances have also helped to change the mix of that investment, with greater variety in value-added products driv-ing up foreign investment in the Canadian dairy sector dairy sector.

Canada's inbound FDI

dominated by greenfield investment Any push to jointly pursue gains in ex-port and FDI performance resulting from the Council's recommendations may bring even more gains to Canada's food processing sec-tor in the next decade. Inbound FDI adds economic growth to

Inbound FDI adds economic growth to individual sectors while also enhancing the sector's domestic competition and lowering retail prices. The last decade has shown si-multaneous growth in Canadian food exports and FDI is possible, lending support to the Council's twinned goals. The time for such a push is now, though. Canada is clearly onon for businesse but

Canada is clearly open for business, but our current 2% annual growth in foreign in-vestment lags that of OECD members, which average 7% growth. Moreover, other major food exporters' greenfield investments represent a higher proportion of their respective total inbound FDI than Canada's. Given the added benefit it lends export performance, greenfield investment could help achieve the Council's goals, and a longer-term boost to food processing GDP.



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New program brings vet students into rural Sask

A new program through the Saskatch-ewan Veterinary Medical Association (SVMA) is giving third-year veterinary stu-dents an opportunity to gain more hands-

on experience before starting their final year at the Western College of Veterinary Medi-cine (WCVM). The SVMA's preceptorship program is a partnership between the veterinary medical association, the Saskatchewan Cattlemen's association, the Saskatchewan Cattlemen's Association (SCA) and the rural veterinary practices in Lloydminster, Melville, North Battleford, Mankota and Ogema where the students worked for 14 weeks this summer. Each student receives a \$10,000 wage with funding coming from the SVMA, its Preceptorship Program Fund, and the indi-vidual practice.

"Because it's a pilot, we decided to only start with five students. We wanted to get some feedback from the practices and the students as to how it went," says Lorraine Serhienko, the SVMA's administrative coordinator and spokesperson for the program.

The preceptorship program specifically focuses on rural practices because of the struggle the SVMA has recently seen in ru-ral practice. While many veterinarians are willing to work in urban centres, it's ben difficult to attract practitioners to smaller communities in the province. "We have clinics that have been closing

their doors or considering it because they [their owners] can't find veterinarians who want to work in rural Saskatchewan," says

We also have some areas of rural Sas-"We also have some areas of rural Sas-katchewan that are under-serviced right now and producers in those areas are cry-ing, basically, for a vet." Ryder Lee, chief executive officer of the SCA, agrees the need for veterinarians is high in Saskatchewan. "There are parts of Saskatchewan where there are 'veterinarian deserts' and we

there are 'veterinarian deserts,' and we want to hopefully see those holes filled as soon as we can—and filled by competent vets who want to focus on large animals,"

says Lee. He adds that members of the SCA board The adds that memory of the SCA board were intrigued by the preceptorship pro-gram and wanted to support a worthwhile initiative that would help to serve the inter-ests of Saskatchewan cattle producers—the organization's funders and key stakehold-

ers. Lee hopes that the students' short-term work trials might convince at least a few of them to pursue practising in rural Saskatch-ewan. "If we can convert some of those

ewan. If we can convert some of those trials into long-term veterinarians in those communities ... that will be a success." One of the students participating in the program is fourth-year veterinary student Christine Reinhart from Lashburn, Sask.



Christine Reinhart spent her summer at Weir Veterinary Services as part of her preceptorship.

She worked at Weir Veterinary Services, the same clinic where she also participated in the SVMA's mentorship program a couple of years ago. That program allows veteri-nary students to experience rural veteri-nary practice between their first and second

nary practice between their first and second years of the veterinary program. "This [preceptorship] program is really good at giving students an opportunity to experience rural practice— maybe some-thing that they wouldn't have otherwise," says Reinhart. "That's what the mentorship program did for me, too. I fell in love with rural mixed practice right away"

program did for me, too. I fell in love with rural mixed practice right away." After participating in both SVMA pro-grams, Reinhart's plans for working in a ru-ral practice are becoming much more con-crete. What has also impressed her is that Saskatchewan cattle producers are working with the SVMA to bring the preceptorship program to life

with the SVMA to pring the preceptorship program to life. "I think it's cool that industry is getting involved and is investing in veterinarians of the future. That's something I really like about this program." As a fourth-year student with more

knowledge under her belt, Reinhart was able to jump right into action this summer. For example, by 11 a.m. on her first day at work, she was working on a cow with a prolapsed uterus. "So it's kind of been that sort of summer,"

Reinhart says with a laugh. She adds that these experiences have made her feel like she could really be a cow vet one day. Getting the chance to work on a variety

of cases is exactly why Dr. Chris Clark-the WCVM's associate dean, academic—sup ports this program.



and experience general practice is really, really important.

Clark says this extra experience before a

student's fourth year is extremely benefistudent's fourn year is extremely benef-cial. They get to see the everyday, run-of-the-mill cases that students don't always see at the WCVM Veterinary Medical Cen-tre. They also get a chance to see how things work when you don't always have an expert to consult when a case comes in— a big difference between the environment at the

WCVM and private practice. "Say you don't know what's wrong with the animal: you decide you want an ultrasound examination, so you go and find a radiologist to do it for you. Or if you want to run some blood work and you're not sure what the results mean, there's a clinical pa-thologist down the corridor," says Clark.

thologist down the corridor," says Clark. "But when you're a general practitioner, you are it. If the animal needs medicine, you're going to do medicine. If the animal needs surgery, you're going to do surgery." The five students have wrapped up their summer experience, and Serhienko says the SVMA and its partners already have a good feeling about the preceptorship program's future. "We are definitely planning on keeping

future. "We are definitely planning on keeping the program another year. Expanding it is going to depend on the student and prac-tice reedback—and funding, of course. But it definitely won't be smaller." Serhienko hopes the summer experience will help the students fall in love with rural life. And even if they decide to go to another practice—or open their own practice —in a rural community, the program's partners will still consider those results as a reflec-tion of the program's success. tion of the program's success





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Canada's flax market is holding up

The domestic flaxseed market does not typically make a lot of headlines. But in the background, cash prices have quietly ticked higher despite the up and down price ac-

into Europe at heavily discounted prices, and they will undoubtedly carve further inroads into the Chinese market as well.

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duction, the flax market will continue to hold up reason ably well through the fall and winter - and may yet gain further - though upside will be restrained by the fact that our Prairie cash market is already seen as an island of

high price. With respect to 2017-2018 carryout supply (or 2018-2019 carry-in), StatsCan pegged flax at only 128,000 tonnes at July, down from 240,000 tonnes from the same point the year before. At about 494,000 tonnes of new crop produc-tion, that puts 2018-2019 beginning supply theoretically at 622,000 tonnes.

Ending stocks at only 67,000 tonnes for 2018-2019 looks very tight, meaning the job of the market will be to dis-courage buyers in the export market. \$13 a bushel prob-ably does it.

Reasonable demand for flaxseed amid overall lighter roduction will continue to hold the market up reason ably well through the fall and winter.

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ution of other crop commodities this summer. We have seen price specials for milling quality flax re-ported as high as \$13 a bushel delivered plant in south central Saskatchewan. Other more common bids are heard in the area of \$12.50 to \$12.75 a bushel.

Combined North American flax production is down this year, which has supported the cash market, maintain-ing an island of high price here at home. Statistics Cana-da currently forecasts 2018 Canadian flax production at 494,000 tonnes.

Russia/Kazakhstan will continue to service flax needs

But with reasonable demand amid overall lighter pro-







AFF





C38

Supper in the field

Supper in the field is one of my favorite events in the whole wide world.

We're not farmers, so it shouldn't really be this way. But May be the something about harvest time that makes me long to be jumping over swaths, cooking up cabbage rolls and carting coffee out to combiners. Maybe it's the fact that I don't have to make supper ev-ery 'blessed' day of harvest that allows me to maintain my romanticized view of this rural tradition.

my romanticized view of this rural tradition. Since I don't have my own fields to take suppers to, I weasel my way into other people's lives. One year we called up farm friends and took out a pot of potatoes, corn, sausage and shrimp and dumped it unceremoni-ously on the end gate of a farm truck. We ate like we were having a Cajun boil by the sea, except for the fact that we were spitting our shrimp tails into the stubble, not onto sand. sand.

Many times I've 'crashed' a field supper by pretending was writing a story about it. Well, I was writing a story, about it. Well, I was writing a story about it. Well, I was writing a story, and taking photos, but really I was there for my own pri-vate pleasure. Watching the kids run through canola, see-ing garden-fresh corn on the cob devoured and getting sunset combine rides makes me happy. However, this year's supper in the field was going to be different.

be different.

Raelene, Russell and Erin Herold were on my supper Raelene, Russell and Erin Herold were on my supper list. If anyone deserved supper in the field this year, it was the Herolds. Having lost their 16-year-old son Adam in the Humboldt bus crash just five months ago, I knew I wanted to bring supper out to their farm as they painfully plodded their way through combining time. We set the night. We picked the spot. And I braced my-self for the worst supper in the field I would ever experi-ence.

ence.

ence. As we drove down a country trail to meet Raelene, Rus-sell and Erin, along with Raelene's brother and his family, I prepared myself for sheer despair. The last time I was in the field with Raelene and Russell, it was spring and Adam's passing was unbearably fresh. During that time,





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I cried, they cried, and even the birds in the sky seemed to be crying for the loss of a life too soon. As I carted out my roaster of chicken, my casserole dish

of scalloped potatoes and my wilted salad to the end-gate smorgasbord, I wept inside for a supper in the field that would be one man down; one person short; one teenager

The 11 of us made small talk, trying to find a glimmer of sunshine in the dark sky of loss. We found a few reasons to giggle: one was the realization that someone had accidentally been wearing his/her shirt inside out the whole day. And ... had gone to town that way, with tags blaring and seams showing.

My daughter Journey told her made-up joke, which brought a few laughs too: "What do you call a burrito that won't be quiet? A taco!"

We celebrated what we could—Raelene's brother's birthday, Callie's new glasses, the start of school, a cheesy grade two joke, the inside-out shirt and a crop that was running fairly well. I know the Herolds are broken inside, but what I saw

in the field with clarity last week was a family that is re-markably resilient. A family that will likely never stop crying inside, but will also always find reasons to smile, celebrate and remember the life of their remarkable son and brother, Adam.

Visit Christalee Froese's blog at bookjourneytojoy.com or email Lcfroese@sasktel.net.





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