

COVID-19 + the Future of Ag Tech and Labour

Video Transcript

00:06

Rene Van Acker: Hello everyone and welcome to the University of Guelph's aryl food Institute webinar on kovat 19 and the future of AG tech and labor my name is Rena van acker I'm Dean of the Ontario Agricultural College at the University of Guelph and I will be the moderator for this webinar before we start we would like to pay our respects to the migrant workers died of koban 19 in Ontario

Bonifacio Eugenio Romero and Rogelio munos Santos, both four young men came to Canada to work and help feed Canadians and they lost their lives doing so our thoughts are also with the hundreds of farm workers who are fighting the corona buyers curly and their families questions about Canada's relationship with migrant farm workers predate COBIT but this virus as well as the black lives matter protests and the current current global reckoning with the structural racism then formed so many aspects of our society has brought new urgency and perspectives to this topic if you'd like further consideration of this topic specifically, we encourage you to read the works of Kerry Primus or Janet McLaughlin links to their work will be sent out to all webinar participants.

Our webinar today is about looking to the future and asking what does the farm of the future look like? This is the question that predates COVID, but is highlighted by it. What skills will be needed on the farm, and jobs off the farm that serve agriculture? And will the pandemic change the dynamic between agricultural technology and labor. These are some of the questions that our panelists will be addressing.

Now to introduce our panelists, we are very pleased to have with us Emily Duncan she is a PhD candidate in the Department of Geography, Environment and Geomatics at the University of Guelph. Andrew Gadsden, Andrew is an associate professor of Mechanical Engineering in the College of Engineering and Physical Sciences at Guelph, and Deborah Hauer. Deborah is manager of Agri labor market information at the Canadian Agricultural Human Resources Council. Thank to all our panelists for being here.

We have some opening questions to get us started and I will ask the question that I ask for your responses in order. Our first question is, when you think about agricultural technology and labor what are the changes and the challenges that have been brought up by COVID? And we will start with Andrew and then Debra and then Emily, if each of you could reflect on that that would be great. So Andrew.

02:52

Andrew Gadsden: mm-hmm all right. Good morning thanks for having me here this morning. I think the major changes that I can think up due to COVID in regards to ag tech, is probably the restrictions on social distancing and how that could be quite difficult to do depending on the farm or the ag environment that you're working in. There's some other obvious changes and challenges that include the use of PPE. There's a lot of shortages for PPE and having it in good working order and being able to use it properly to prevent the spread of COVID it's also another change and challenge right now. Further to I guess kind of trying to reduce that spread which is difficult in tight living quarters for our temporary workers that are helping us out in Canada. I suppose on a large field would be easier to maintain that 2 meter working distance, but that's really not practical and nearly impossible in a pack processing plant such as Cargill plants which we've heard about in the news, how they've had to shut down temporarily go through a lot of disinfection and make sure everyone was safe. That clearly impacts our and can continue to impact our food supply.

I think in regards to the labor market, we recently heard about I think five thousand Mexican temporary workers being stopped by Mexican authorities from leaving for Canada. Unfortunately, due to these ghovats related deaths obviously they want it to be safe further for the people which makes sense. Although the Canadian government lifted restrictions on temporary workers for the ag space, it doesn't necessarily mean that they'll be allowed to leave their home countries or even want to come if they feel that it will be unsafe. I think 5,000 Mexican workers represents about 20% of the average annual number of workers that come from Mexico and about 10% of the total temporary foreign worker population, which I think as of a couple years ago was just over 50,000 people. It's really a significant impact on the labor market which I think the other panelists can talk to a little bit better than me. Now there are a number of temporarily unemployed people in Canada, particularly senior high school students and undergrad students. They may be able to help fill the gap but I don't really know obviously what those intentions would be or what the stats are but it could be a possible solution at least for the summer or what's left of the summer.

I think really one of the main long-term solutions to help tackle the labor shortages and minimize any kind of disruptions in terms of labor, is to look at increasing the amount of useful automation on the farms and the steps in between the farms and people's plates, because there are a lot of steps in between. I say useful automation because we need to make smart investments and what is economically feasible in a relatively short period of time since automation equipment is quite expensive and profit margins can be tight depending on the crop or the year.

I guess in summary the the major challenge in the ag space due to COVID at least in my opinion, is going to be related to the human or the labor shortage element. Not just the physical labor, getting the crops are processing it, but transporting it across borders thankfully that hasn't been an issue at least not that I'm aware of. Those challenges can lead

to a number of opportunities to really help transform this ag space and in a short period of time which I think we're going to be talking later, so I think I'll stop here and pass it off to Deborah I think.

06:51

Rene Van Acker: Thank you Andrew, Deborah.

06:55

Debra Hauer: Thank you very much for inviting me to be here today. When we're thinking about the challenges to do with the pandemic from the perspective of labor, we can be thinking about that agricultural producers have not been able to find enough people to work on their farms for decades now many many years, and that the the COVID-19 situation is exacerbating or making these issues much worse as Andrew was mentioning. We need to be thinking about Canadian workers. Certainly Canadian workers are are cautious about working at all in workplaces and there has been have been issues with increasing absenteeism, increasing caution about working in workplaces, and also a very large concern about childcare because schools and child cares are closed and people are at home looking after kids. There are issues around Canadian workers who are interested in working and may not be able to or are cautious about doing so. Andrew mentioned about temporary foreign workers including soft workers the seasonal agricultural worker program not arriving, not being able to arrive because the sending countries are placing restrictions on that and also a variety of issues that are making it more difficult for people to come to Canada to work.

Now there have been many different programs many provinces have started programs in order to try and encourage Canadians to work on farms. In Ontario the Feed your Future initiative just has been getting going in the past few weeks, but there have been programs in Nova Scotia and New Brunswick, Alberta, Manitoba where there are provincial programs trying to get - encourage people to work on farms this and also not only this summer but also to consider agriculture as a career in the future. We are halfway through the summer right now, so it will be interesting when you look at the tea leaves in a few months to see how well these programs have worked. Certainly in New Brunswick temporary foreign workers were barred for about a month, and the the intention was that unemployed New Brunswickers would take those jobs and the efforts in New Brunswick largely did not work, and now the borders have been opened up to temporary foreign workers. It will be interesting to see how these efforts do pan out over the course of the summer. I'll pass it off now to Emily

09:40

Rene Van Acker: Thanks Deborah. Emily.

09:43

Emily Duncan: Yeah thanks for having me here today. I think this is a really important question because agriculture has been facing these labor challenges, as Deborah mentioned, well prior to the onset of the pandemic and we're seeing that the sizes of farms are increasing, we're having an issue of rural populations, and as Debra mentioned the type this type of work

isn't something that Canadian unemployed Canadians are willing to do. So it's it's a huge challenge to figure out how we can make the seasonal agricultural workers program work for our food system and our supply chains but at the same time be a system that is just and equitable and treats these workers fairly and gives them access to the services that they need. I think you know there's been problems with this temporary foreign worker program for years and we've been hearing about these and justices but kind of the pandemic has really brought these issues to light about the types of working conditions that some workers are facing, and how this can be done through social distancing and have access to PPE so I think there's definitely a challenge there.

I'm really interested in kind of like the whole range of challenges for agricultural labor on the farm to fork continuum. I have an upcoming research project that's a summer and it's looking at how grocery store workers have been impacted by the pandemic. We're seeing that there's low-skilled low-wage workers on the farm, but then we're also seeing that at the grocery store that people are essentially putting themselves in vulnerable situations, and putting themselves at risk and they're not even making living wages. I think there's a real question of equity and fairness about the type of work we're asking people to do and the remuneration they're receiving for it during a pandemic. I think I think that's been a one of the main challenges that COVID has brought to light in the agricultural sector.

12:00

Rene Van Acker: Well thank you Emily, and thanks all three of you for that opening perspective. It's quite a diverse landscape in terms of the various facets of this issue and and it's impressive to me the way the three of you have been able to cover that landscape and lay it out for us. It is a dynamic landscape although it's a long-standing challenge around farm labor needs, but we're also interested in not only the evolution of those farm labor needs and what happens, but then work in the sector more broadly as it continues to evolve. From your perspectives, what skills are going to be needed for farming and for agriculture of the future? And maybe Deborah that we could start with you.

13:00

Debra Hauer: When we talk about what the effects of the the pandemic has been on agriculture, one of the effects has been an increasing emphasis on skills. Now this is a concern or an issue that has been coming to before the pandemic, but has been made worse in the past few months. Farm employers are finding that are unable to find people with the skills that are needed to work on their farms and also in agri-food businesses, and you were

asking what the types of skills that will be needed. So certainly because as Emily mentioned, the farms are getting larger, there are getting to be there's getting to be more in the way of technology and innovation in farms, technological skills will be needed and also that data analysis skills as well too. When we're talking about innovation and technology people think about whizzy new machines, autonomous tractors or robots, but there are lots of other sorts of innovation that people will need to manage and there will be increasing needs for our skills in those areas as time goes on.

I would like also to mention that human resource management skills will be increasingly important as farms become larger and there are more non-family employees, then people will need to know how to manage a more complex operation. They'll need to know how to find people to work on the farms, to find the good fits because, as Emily mentioned people are not wanting to work on farms so much, and so we will need to be able to find good people. Also even more important, resource managers will need to know how to keep people and how to treat people well in order for them to want to stay, because as I say once you have found a good employee they're like treat them like gold, because they're hard to find. In addition to human resource management skills, soft skills will become increasingly important. Such skills as communications, motivating your team will become more important as well because in the future it will be the soft skills that will be needed because, as a farmer I recently said to me, 'in the future it will be the best *team* that wins' and it will be increasingly an for teams to pull together in farm operations. Thank you for that.

15:44

Rene Van Acker: Thank you thank you Deborah your answer reflects very much the kinds of things we've seen in for example the RBC Wanted Report, which then led to their farmer 4.0 report. Emily the same question for you.

16:01

Emily Duncan: Yeah I think Deborah's points were really important. I often would like to refer to them not as soft skills I feel like that downplays them a little bit, but foundational skills. These are the skills that everyone needs to have be successful in the workplace and it doesn't really matter what job you're doing. When we're thinking about how I come from the perspective of an educator, how are we teaching these skills to the next generation of agricultural leaders. We know that there's so much opportunity within the agricultural sector for jobs and employment and I think it's kind of overlooked by a lot of young graduates of working in farming is manual labor and this kind of thing, but as we move towards more innovation and technology, the types of skills needed on the farm are really diverse and even not just within the farm but within the industry at large that supports the farm. When we're thinking about these kind of foundational skills we're talking about critical thinking, flexibility, and adaptability, clear communication skills, time management and teamwork.

Traditional education systems I think sometimes we we've been in the past a bit too focused on learning the discipline and you know making sure that people have those technical skills, but these skills are equally important and they come they come from an interdisciplinary education. I think that's something that at the University of Guelph we've really tried to focus on through different programs for opportunities for students from the Food for Thought program the Arrell Food Institute, the ideas congress, the icon classroom, it's about giving students real world opportunities and experiential learning to be able to develop these types of skills so that they can be successful in the future. I think this is one area that as many educators we're navigating to be able to figure out how to offer these types of learning experiences during the time of COVID. For example last fall, I was teaching a class that I developed called the digital agricultural revolution and it was about exposing students to different types of innovation in agriculture and we were visiting farms and we were talking to researchers and it was a really great experience but I'm not quite sure how that kind of same learning experience translates to an online classroom. I think that's kind of one of the challenges that we'll be struggling as education shifts online, how do we make sure that we're still building those foundational skills for students so that they can enter enter the workforce force in agriculture and be successful. Farmers today, they're they're not just farming they're business people, they're accountants, they have to be environmental scientists, they're doing human resource management, they're mechanics, they're vets, and increasingly computer software specialists, so there's a whole range of disciplines that fall within agriculture. I think it's really important to develop a wide range of skills

19:11

Rene Van Acker: Thank you very much Emily. Yeah that crossover between hard skills and yeah foundational skills, thank you for that the shift in language. Yeah Andrew.

19:22

Andrew Gadsden: I think they covered everything so, no just kidding, I think I'll have a few more things to say I guess thanks to to Debra and I'm Emily, you've covered a lot of a lot of my points as well. I guess when you say farm of the future really there's a number of important skills that are required right now and they'll continue to grow quickly especially due to you know issues such as COVID accelerating the change a little bit more quickly. So obviously you need to have a solid agricultural background to manage farms or processing facilities, but there are a number of other technical skills as well beyond you know the foundational skills.

I think you mentioned already Rene but there was a report released last year by RBC that predicted that in a decade's time, so 2030, farms will be operated largely by autonomous machines and digital logistics systems. Therefore farms should be, and they already are beginning to be, staffed by highly skilled engineers, scientists, communication professionals,

really digital savvy people so I think the typical skills for this type of farm in general would be data analytics, computer programmers, mechanical and electrical engineering backgrounds or basically mechatronics. Right now I think we're seeing a deeper integration of IT into agriculture and agri-food equipment, so I believe it should and will continue to grow until nearly all major systems are connected online, and you'll be able to get a real live snapshot provincially, nationally, maybe even worldwide on what the ag space is looking like so really in this space I think industry is currently doing and working towards automatically picking produce, such as tomatoes and greenhouses or apples and orchards, tilling fields through the use of GPS and machine or computer vision, you know milking cows obviously, or even automatically looking for disease through crop rows or in greenhouses, looking for pests you know these kind of things that would affect the overall crop health or the yield. Also I get I guess there's a lot of manual tasks that are being overtaken by basically smart machines or intelligent systems that will perform tasks automatically while collecting hopefully useful data that can be used to estimate crop yields, predict problem spots and crops, areas to apply more nutrients and modern and so forth, so maybe the farmer will wake up maybe you can sleep in a little bit longer in the farm of the future and they'll get a report saying hey based on yesterday and future rainfall and the weather in general you should go ahead and you know target this little crop spot today; you know make more informed decisions. I think the use of big data although I don't really like that term and data science analytics will hopefully make farms more efficient and healthier too to mitigate environmental impacts and also you know the human impacts of also providing food for us. In summary with each growing year non-traditional skills that you would quite often think of for farmers or the ag space are going to be required so you have data analytics computer programming mechatronics engineering all these are going to be needed for the farm of the future you know as early as tomorrow. Thank you.

23:23

Rene Van Acker: That's a that's a very insightful analysis Andrew and it strikes me that when you for example ask farmers who have switched to robotic milking systems, how it's changed the way they manage their farms, because it's exactly how you say I mean it really does fundamentally change the way they farm and the way they think about being farm managers. Very good point.

We have a we have one more question and then we're going to shift to questions from the audience. COVID will no doubt create long term impacts, it's a pandemic after all and those long term impacts will include impacts on agriculture technology and Labor's labor what opportunities post-COVID in terms of those long term impacts do you see and how do we get to those opportunities? And this time Emily if we can start with you.

24:32

Emily Duncan: Sure. I think in terms of the long-term opportunities we're going to continue to see some of the successes that we have seen in agriculture with new innovations and agri technologies. Just an example from my own research and thinking about the dairy sector, this has been one sector that's really struggled with labor shortage and by adopting real technology such as robotic milkers, farmers have really been able to change the way they manage their animals, but also the way they manage their labour. One example I have from my own research is that there was a farm and they had a fairly large herd for Ontario, over 500 cows and they put in ten robots and what this did to change their labour situation as they went from nine part-time workers, who some of them started shift work at 4:00 a.m. to milk cows and work till 10 p.m. and came back for shifts at 10:00 p.m. at night to milk cows later it really changed they changed their labor dynamic from nine part-time workers to five full-time workers. They were able to offer a better job to these rural labourers and that was more focused about you know learning animal husbandry and had more tasks than just attaching milkers to cows and they were able to offer benefits to these full-time workers and just offer better employment in general. So I think that's one of the opportunities that we see with Agritech and labour, but at the same time I think what the pandemic has really brought to light is the challenges within the horticultural sector. Agriculture is diverse; we don't typically have temporary foreign workers working in the dairy industry but they're predominant in the horticultural industry and this is one area where the development of Agritech I think definitely will either speed up or people will start shifting their farms, because the challenges of providing PPE providing safe working conditions to temporary foreign workers. Within Ontario we're fallen short, we have over 600 cases on farms and I think farmers with this challenge they do want to shift to automation but at the same time if there is- if that technology isn't available affordable and working efficiently there's the potential that we're gonna see shifts in farms. People might get out of horticulture where labor costs are often over 40% of the total of farming operation and at the same time that they have these challenges around labor so what we might see is horticultural farms switching to more grain operations and growing more corn, soy and wheat. There is a plethora of Agritech technology is to make those farms more efficient but at the same time our horticultural sector is really important to providing fresh local fruit and vegetables in making sure that Canadians have access to nutritious diets.

There's a ton of challenges that we're gonna see in how people adapt to the pandemic. The labor challenges that we've seen in that agricultural sector are are definitely going to continue and I hope that for farms that choose to continue to keep migrant employment that we are able to see better working conditions and more equity and justice and access to healthcare and services for these workers and ultimately a pathway to citizenship.

28:27

Rene Van Acker : Thank you Emily, Andrew.

28:31

Andrew Gadsden: Yeah. Well hopefully the COVID disruption can be minimized as much as possible this growing year. A lot of us are optimistic in general that you know hopefully COVID will be completely resolved by summer 21, if not I guess we have a lot of other non ag issues to worry about. Just a little example here around the turn of the 20th century, about a third of the crops grown in New York State we're just used to feed horses, used for transportation. Obviously this is not the case anymore but it's an example of how technology can and often leads to changes in our society. I'm hoping that that this is a really good opportunity for us to reevaluate our fruit or food security and food pipeline here in Canada and think of ways to mitigate impacts due to any kind of external factor or disruptions. Since 2011 Canada has consistently ranked as the world's fifth largest exporter of agricultural products, but we've really only invested a small fraction of money compared to other countries in food production R&D, so that that there is an example where there's significant opportunities here for investment by the Canadian government and industry, the Canadian people themselves to really become leaders and automation and robotics especially in this ag space and you know investments in the ag space can and will often lead to improvements in other industries right . I think there's opportunities here to improve automation further I feel like we're really just getting started and minimize that human footprint on the field and processing plants to reduce the risks due to labor shortages or to shift the work just from manual labor to some other type of work on the farm. Whether it's coal be related or due to climate change other possible issues I think there's opportunities here.

Also, I read a stat somewhere, I'd have to dig it up again that historically introducing the use of automation actually increase the number of full-time people working in the ag space but maybe not necessarily doing the actual manual labor. It's something to consider that all these jobs they may not just 100% of evaporate, they might just be transformed into other aspects or opportunities in the ag space, at least that's the hope. I think integrating automation with data science and analytics will further improve our food efficiencies and it can also help lead to better forecasting and yield predictions, all these important factors you know for the business side of the ag environment. I think we're really entering a new space where we're gonna be using a lot more smart systems for food harvesting and processing handling, transportation and these opportunities are definitely exciting but there's obviously a significant amount of work still to be done. Hopefully these opportunities will lead to good investments here in Canada. Thank you.

31:52

Rene Van Acker: Yeah you're right, I mean that is a very good point that even if technology's impact labour or reduce a need for labor on farms, history has shown us that overall the agriculture sector including absolute numbers of jobs in the sector grows because of that. They're just different kind of jobs they tend to be higher skilled jobs but yeah that is true.
Deborah

32:20

Debra Hauer: Thank you. I've been hearing Andrew and Emily talk about the increasing skills, the increasing use of technology that will be used on farms and that we will be needing people with a higher level of skills in a variety of areas in the future. My question is where are those people going to come from? I think in my mind the current pandemic has elevated discussions amongst a general public about food, food security, food supply chains that perhaps when people go to the grocery store and they see that there's no milk or yeast or flour on the shelves they're going 'oh my goodness I had no idea, what's up with that?' because people had not been thinking about those things up until a couple of months ago. Now with the elevated concern about our food supply it is an opportunity for us to be thinking about how to attract people through the agriculture industry so that for those jobs that Andrew and Emily have described, the high skilled jobs that will be needed in the agriculture and agri-food industry. I think this is a real opportunity; the time is now for us to be thinking about how to attract those people.

I should mention that recent research by the labor market information Council with young people who were in high school and also early university and college years, indicated that the number one thing that young people looked at when they were looking at what kind of careers to go into the first was wages, the second was Occupational Outlook, well I have a job when I'm done this program, the third is the cost of living and that reflects the concerns with high housing prices and the largest centers in Canada, and the fourth is the industry, so if we're looking to encourage people from outside of the agriculture and agri-food attempt to think about going into the sector with high-skilled jobs in the future we need to be looking at getting more and for more and better information about wages and occupational outlets to encourage people. It's one thing to say 'raah raah agriculture and agri-food is good' but we're we're inside the tank already and perhaps that message is not getting out to the general public. I'll just put that out there and stop for now.

34:56

Rene Van Acker: Well thank you thank you Deborah, and thank you to all of you. We do have a number of questions coming in from from the audience, and I would I would group a number of the questions that have come in that are specific to foreign agricultural workers and and these questions many of them pertain to some of the answers that were given already around the shift in movement away from labor that may be usurped by technology. Could could each of you maybe, or I'm not sure who wants to go first reflect on how that shift will happen I think some of the questions display some worry that that'll be a very rapid shift and suddenly foreign workers who've really depended on this opportunity will be will not have those opportunities anymore. Maybe if Andrew you could comment on that, I don't know who would like to go first.

36:00

Andrew Gadsden: I can jump in in the fray first I guess. Yeah it's a really good question and I was actually thinking about that this morning, you know, I think back to automated cars and how all the highways eventually would be automated really rapidly. That doesn't happen overnight that that's probably a couple decades away to be honest with you from what everything I've read. The same thing here, I think as we move towards more automation more intelligent systems I think yes they'll be less requirement for for you know the raw physical manual labor but there'll be other requirements that hopefully domestic and foreign workers can fill those roles. I don't think it'll happen overnight I think we're talking probably a couple decades before you see you know a full turnkey solution of you know from you know the field to your food on the plate, I don't think that'll be fully automated. But yeah that is a very valid question, I think it'll take a number of years if not decades for that to fully be automated you know that's all I can think of right now for that that's a great question.

37:17

Rene Van Acker: I mean I would remind the audience too that you know we we reached a peak of number of farmers in Canada in 1941, and that's a long time ago and they've been a steady decline since then but it didn't drop off a cliff and so these changes aren't necessarily overnight. I know Emily wants to jump in.

37:40

Emily Duncan: Sure. I think this is a really important question about how these changes will play out. and we know that automation is going to change the nature of work, but at the same time I don't think this means that yeah we immediately scrap our our temporary workers program. We have to think about not just the injustices that happen here, but like why do we have a program like this to begin with and why is it important for these workers and their lives and livelihoods to be able to come to Canada and have this opportunity? We know that earnings from this type of work it makes up a huge proportion of the GDP of the countries that these workers are coming from, Mexico, Guatemala, Jamaica. Typically workers are sending about 10,000 Canadian dollars home a season, and that's that's really important for the development of those areas and so when we're thinking about you know big-picture how can how can we change that, it's there's no easy answer. One thing that kind of has been discussed is that you know a lot of these developing areas are kept in poverty and low income because of structural adjustment policies a lot of these countries owe loans to developed countries, Canada included, and if we were able to do some loan forgiveness for these countries then they would be able to devote more money into their public services their education systems to create better livelihoods within those countries for their own people. At the same time, as we know that automation is going to become in gradually, often workers come to the same farm year after year and so these are the people who have worked the land who know these these details about harvesting, and so as we kind

of see it automation come in slowly, I think that within the program it would be it would be beneficial to build in ways for workers to become permanent residents or citizens as overtime they're gaining that experience on Canadian land and also learning how to use these technologies, so that you know once automation is in place you still gonna need workers you're still gonna need that human element to be able to you know spot pests, do management, understand what kind of challenges are coming along. Because you know working on a farm it is manual labor but once you've worked the same field over and over you'd start to notice things and that it's gonna be really hard to replace that human dimension. So I can see that through a better program with kind of more more equity and more justice put in place, those are kind of the immediate baseline things that we need to do right now, is have more oversight over around housing over recruiters because that's where we're seeing a lot of the problems.

I also want to make the point that a lot of these the problems that are coming to light, it's I want to say that it's not it's not every farm and it's not every farmer. A lot of people are really happy to have temporary foreign workers come and be part of their farms and be part of their families during the harvest season, and a lot of them don't have a choice when it comes to labor issues. So people who take part in this program I don't think we should be demonizing them but we also do need more oversight into this program, and then we also need to see how we're training these people and what could be the long-term implications for them filling some of these labor gaps.

41:39

Rene Van Acker: Thank you very much Emily. Deborah.

41:43

Debra Hauer: And I have very little to add to Andy's and Emily's very good points, other than many people who are foreign workers when they return home they purchase they are able to purchase homes send their kids to school and also have businesses at home as well too. So that the the funds that they are able to make in Canada then allow them to have their own farms in their own country and there may be an opportunity for that to encourage agricultural production in home countries as well. And I'll leave it at that because I think Emily and Andrew covered it very well

42:26

Rene Van Acker: Ok. thanks very much. I know we we have a lot of questions in, I'm trying to group them so that we can cover a lot of ground. We did have some people asking about climate change and whether climate change and adaptation to climate change has a fit into the future for our management and employment opportunities. If anybody wants to jump in on that one.

43:01

Andrew Gadsden: I can take a first stab at it as well. Yeah I think that's a huge impact and it's it's more of a longer-term impact but we're seeing the effects of it more and more now, you know with with more extreme weather events I guess more harsh environments in terms of some areas I guess in North America are getting a lot more precipitation than normal, other areas are not getting enough precipitation. I think one area that farmers at least the ones that I've communicated with they're trying to improve their forecasting model in terms of their yield and looking more specifically at I guess using precision agriculture, so getting real I guess precise knowledge of the area of their farm, knowing you know what areas need more nutrients maybe it's caused by you know maybe there's more runoff due to more precipitation than normal. I think the use again of more more data and making more taking more sensors or measurements of the environment itself and then trying to predict what will happen in the future due to the effects of climate change is some things that are being looked at right now. Eventually I think that could could fill into the management of the farms themselves you know you get a weekly yield report or an estimated yield, and again with the effects of climate change I guess in my understanding you just have these more severe weather events, so yeah you'll have more short-term impacts depending on what type of season you get. Again, I hope with the use of technology first of all we can hopefully stop climate change or it reduce the negative effects of it and make better use of the environment that we currently have to grow our food. That's I guess that's where I would start the conversation and we'll see where it goes.

45:05

Rene Van Acker: well thank you very much Andrew. Emily

45:08

Emily Duncan: yeah one of the implications that I think about when we talk about climate change in agriculture is, what we have the ability to grow and where we can grow it is changing from climate change. When it comes to climate change, there are going to be definitely winners and losers. Some areas are gonna get drier and hotter like sub-saharan Africa, but a place like Canada are where we can grow more crops we're gonna be able to extend farmland just further north, which has its own implications for whether you know releasing the carbon that's held in those soils will expedite climate change there is definitely a feedback loop there, but even in southern Ontario and kind of along the border having more heat units allows us to grow a greater diversity of crops. There are opportunities there for the farm sector to continue to grow and produce more things and I think this will continue to impact labor in a way that they're just going to be more and more opportunities for our agricultural sector as climate change kind of presents these opportunities for new types of agriculture in different areas.

46:27

Rene Van Acker: That's great thanks Emily.

46:30

Debra Hauer: I was going to just mentioned that farmers are already doing much in the in their farm operations to manage their their operations and in an environmentally sustainable manner. The effects of climate change will is a part of the entire package so that in addition to extreme weather events or different types of agriculture that as considering the practices that they're doing now in order to store carbon - that will mitigate the effects of climate change that people will need to learn and understand how to continue to do the things that they're already doing as well as add new practices and that then involves new skills, whatever those might be.

47:24

Rene Van Acker: Well thanks very much. This next question I'm balling together a lot of what's being a lot of different things kind of different things that are being asked but I'm trying to pull them all together because we we're running out of time. Is the is the sector, so farmers, companies, institutions like universities and colleges involved in the sector, are they doing what they need to do in order to attract and develop the people they need for now and for the future for the sector? Are they also doing what they need to do to develop the technology and the innovations required to create the future? One of the questions said you know are we doing enough to ensure that at least some of these are made in Canada so that's kind of a double-barreled a big question but I'll just throw that out there. I see nobody's jumping on.

48:30

Emily Duncan: I'll jump in here. I think we're kind of just at the start, we're trying to figure out what we need to do to get there. From my experience of talking to people who are working in the digital agricultural space what we're seeing is that there's there's a bit of a disconnect between kind of the tech side of things and the agricultural side of things. In companies that I've talk to, you what they're they're able to find as people who worked in tech but then but they don't have that agricultural background knowledge that when you're using these types of technologies you kind of need them both to be working together; knowledge of the land but also knowledge of how these technical software platforms data analytics work. I think a lot of agricultural companies who are looking to hire are having trouble finding people who are have kind of merged those skill sets and so I think as universities and colleges we've identified that gap and we're looking to fill it with the course offerings and program offerings that are available, but also at the same time I kind of are I think our institutions need to catch up in the sense that in terms of data and data ownership privacy security of agricultural data we've been lagging behind on that of putting regulations

in place to make sure that farmers feel secure and using these technologies, that their information isn't going to be stolen or corrupted or isn't being used for some kind of corporate benefit when they've invested thousands of dollars in this technology to make their farm better. What I think we're needing is a little bit more of oversight in terms of data regulation and having about a better data governance mechanisms within the agricultural sector because the data that comes with our food is so important and it can put food security at risk if these systems aren't aren't secure. I think those are some some of the challenges that that we're seeing kind of institutionally of how are we able to address these problems and make sure that we're finding as we move into new technologies that we're cultivating people who have an understanding of our food system but also an understanding of the technical and digital kind of applications that are also being developed.

50:59

Rene Van Acker: yeah thank you Emily. Andrew I might just jump to you and then I'm gonna come to Deborah, jumping in from that to the that made in Canada question yeah technology and innovation

51:12

Andrew Gadsden: Yeah. So being in a you know University of Guelph research space, obviously ag is a big component of Guelph and what we do here. There there actually is a surprisingly amount of made in Canada solutions and investments happening right now, obviously there's never enough R&D happening from my biased perspective. There are some wild examples of, I guess not terribly wild, but automotive manufacturing companies wanting to get into the ag space. They have a lot of the tooling now the skill set in terms of robotics manufacturing but now they've seen there's a huge opportunity in economically speaking to become you know there's a space there to enter and to grow. Without giving names or there are examples of automotive companies buying agricultural companies in you know Manitoba and Saskatchewan to try to further their their footprint because there's a lot of opportunities there for selling products and developing products, specifically currently being used in North America.

I also like the the the point that Emily mentioned regarding the data oversight, I saw this when trying to on another project looking at modeling the effects of COVID on the Canadian population. Each province has their own data set, their own data management, it can be very messy a little confusing it would be great if at the federal level we had some kind of - maybe there already is and I'm not aware of it but maybe they're a ministry of data science and security, some kind of oversight to keep things consistent, secure safe. We can make a lot better use of the data to kind of predict what would be happening you know in the next

short while or in the future. Yeah I think there are there is a fair bit of stuff happening in Canada in terms of R&D, I personally am looking at automating picking apples and orchards inspecting them counting counting how many apples there are, how many flower blooms, looking for pests, disease, this kind of stuff so it seems to be a blooming business so to speak pardon the pun and so with that.

53:47

Rene Van Acker: Thank you. I know Deborah wanted to jump on on the broader question as well.

53:55

Debra Hauer: I'm just going to mention that a year ago I was asked during a presentation how to how to encourage there some questionnaires fifteen-year-old daughter to consider agriculture as a career? I said to in response that agriculture is a tech industry and there's a lot of people talk about IT and technology and the knowledge of college economy, but people often don't think about agriculture and technology together. People don't think of that they think a farm laborer as somebody with a hoe out in a field or somebody on their hands and knees picking weeds, but it really is a technology industry. If the general public were to understand that then we would be able to attract people from the technology side into the agriculture side, because I agree with Emily that there is a shortage of people who had the knowledge of Agriculture and also the tech skills. That also means we also talked a lot about how the general public doesn't understand the agriculture industry within the executive understood is a little bit more, I think there's an opportunity for us to go out and say that agriculture is a technology industry and we would like to have people join us to work on these opportunities for the future. Thank you.

55:19

Rene Van Acker: Well thanks very much Deborah. The last question we just have a few minutes left and again rolling together a couple of the questions from the attendees. There was a question about equity, diversity and inclusion in the agricultural sector and and it relates to Deborah, your points about recruitment of people into the sector. So I wanted to ask all the panelists about your perspectives on having more equity diversity and diversity and inclusion in the sector and about how to go about attracting more people into the sector. I mean I'll just make a note there that that in the Ontario Agricultural College in terms of equity at least, our undergraduate diploma and graduate student population is now 68 percent female which is a tremendous change from say 50 years ago, but we still lack diversity in the college. Anyways just reflections on that last question.

56:34

Debra Hauer: In my view, increasing diversity in any sector the economy strengthens strengthens that sector and it is important to have the voices of everybody and develop the

capacity of everybody within a sector because that will make us all stronger. This is something that is a much larger issue to discuss than in the remaining few minutes that of this webinar so I would encourage a conversation like this could take an entire hour. All that to say we are as an agriculture industry at the very beginnings of this discussion and this is something that we will need to focus more so in the future.

57:20

Rene Van Acker: Thank You Deborah. Andrew and Emily less than a minute each.

57:23

Andrew Gadsden: Yeah sure I won't take long, just 5-10 minutes. So obviously EDI is critically important particularly in the research space where I'm obviously a little bit more biased, there's been some studies that showed the more EDI in in sense of you know more equitable opportunities more diversity more inclusion of everybody, leads to greater research output and better productivity, better quality overall. I mean you can't complain about any of that so I think it's something that we need to continue to work on and encourage and as Deborah mentioned we need a lot more time to discuss that.

58:03

Rene Van Acker: Thank you, and a final word, Emily.

58:07

Emily Duncan: Yeah I mean I think given the current events of the last couple of weeks it's really bringing to mind a lot of the work that needs to be done globally, but also within agriculture to increase diversity and inclusion and support Black, Indigenous and people of color to become leaders in our industry and to make sure that that space is welcoming and inclusive. There's been so many conversations about that there's a range of resources on how to be a good Ally out on the internet and I think that you know the people who are currently in places of leadership and agriculture right now, you have a voice and can make these statements to make the agricultural space more inclusive.

58:54

Rene Van Acker: Very well said Emily and thank you. I'd like to thank our panelists again Andrew Gadsden, Deborah Hauer, and Emily Duncan. I'd like to thank the Arrell Food Institute, its director Evan Fraser and the people who have been making this happen, Muriel O'Doherty Collen Hennan and Maggie McCormack. I'd like to put a pitch in for the next webinar COVID and the restaurant industry, that will be Tuesday June 23rd from 11:00 a.m. until noon and registration details will go tomorrow. Thank you everybody. I thank the attendees for being part of this webinar and thanks everyone have a good day.