Strengthening the Understanding of Conservation Authority Staff

A Report to the Ontario Ministry of Agriculture, Food and Rural Affairs to support efforts of the Healthy Lake Huron Initiative and the Canadian Agricultural Partnership for Stewardship Clusters

Stewardship Clusters Project #2018-010(a)

Activity 4

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February 11, 2020

Healthy Lake Huron
Clean Water, Clean Beaches

CANADIAN AGRICULTURAL PARTNERSHIP
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Introduction

Conservation authorities along with the provincial ministries involved in agriculture and natural resources have provided extension services to farmers for decades. These services have helped improve agriculture and conserve the environment and have included technical advice and links to funding programs. A variety of methods have been used: one-to-one (on-farm, in office, phone or email), workshops, field tours, fact sheets, online resources, etc.

A wide suite of knowledge is needed to manage soil and water resources. Agri-business providers (contractors, crop input, equipment dealers, crop advisors, and other consultants) can be trusted sources of information related to stewardship practices including structural best management practices (BMPs) such as water and sediment control basins as well as management practices such as nutrient application. They have a significant amount of influence on producer decisions and actions. To help conservation authorities and other agencies that are attempting to encourage best management practices, it is important to begin to understand the other agricultural stakeholders perspectives.

To better understand the different perspectives of the agricultural industry, conservation authority staff were encouraged to attend at least one event, hosted by the agricultural industry and aimed at promoting primary production or economic development. ese events will not be hosted by the Ministry of Agriculture, Food and Rural Affairs or any other organization whose primary theme is the promotion of agricultural stewardship.

- Reports from the events were to highlight:
    - What was learned from attending the events;
    - Whether it is possible to incorporate what it learned from attending the events into its objectives of promoting soil health, water quality and BMPs; why or why not;
    - Any suggestions on how messaging about the promotion of soil heath, water quality and BMPs could be incorporated into the information being provided at the events the Recipient attended; why or why not.

Methods

Our first task was to compile all agriculture-related events occurring between November 2019 and February 2020 that were relatively local to the Lake Huron Shoreline. St. Clair Region Conservation Authority staff compiled the list and sent it to the other Authorities (Appendix 1). Staff from each Conservation Authority attended multiple events to widen their understanding of the complexities of the agricultural industry.

To date, conservation authority staff have attended eight different events including: the Lambton Cattleman's Association, the Lambton Soil and Crop Improvement Association Annual General Meeting, Grey Bruce Farmer's Week, Dairy Farmers of Ontario Annual General Meeting, the Southwest Agricultural Conference, FarmSmart, Land Improvement Contractors of Ontario Conference and the Ontario Soil and Crop Improvement Association Annual General Meeting. Highlights of each event are found in Appendix 2. An overall synthesis of the activity is found in the next section.

Synthesis of what was learned from attending workshops and events outside a stewardship lens

The non-cropping season in Southwestern Ontario is full of workshops, events and conferences. Local chapters, provincial groups and industry host farm speakers, industry experts, and researchers to share regional updates and information on various aspects of the agriculture industry. The topics range widely from drainage to block chain to compaction to growing bigger yields. Conservation authority (CA) staff were tasked to attend a variety of these events to build capacity and expand our understanding of the pressures and complexities of the agriculture industry.

After attending more than 8 events, conservation authority staff determined some key take home messages:

- On farm decision-making is complex because of many external demands.
    - There are many factors outside the control of a producer including the environment/ climate change, consumer demand, commodity pricing, resistant weeds/pests, etc.
    - Producers reach out to agronomists, certified crop advisors, and their local ag community to learn how they can mitigate risks.
    - Attending these events showed conservation authority staff how much information a producer needs to analyze to make sound financial decisions. There was also sometimes conflicting information about the costs and benefits of certain best management practices (BMPs). It is fair to say that conservation authority staff better recognized that there is considerable complexity that a farmer has to navigate to undertake BMPs. .
- Implementing systems changes is difficult.
    - **GAP:** When farmers do want to implement BMPs, there can be a gap in extension resources to assist with technical issues that may arise.
    - **OPPORTUNITY:** producers are more apt to try a novel-to-them approach when they have knowledge and support. Continued plot trials by OMAFRA, local Soil & Crop chapters, CAs, and local farmers will reduce perceived and real risk.
        - For example, Jake Munroe, OMAFRA (at OSCIA AGM) shared the outcomes of plot trials of late termination of rye cover crops and planting green (soybeans into rye). His research showed that when planting green, it is best to increase your soybean seeding rate, to ensure similar yield output (>160,000 seeds/acre). Concrete numbers mean the guesswork has been removed or already determined, so the producer can go ahead with more confidence.
- Producers receive information from many sources.
    - **OPPORTUNITY:** Acknowledge the competing interests that producers are trying to meet as they attempt to make their livelihood.
    - **OPPORTUNITY:** CAs can incorporate soil health and water quality information into messaging from these sources to strengthen it.
    - For example, Profitability Mapping – talks about drainage, cover crops, but not necessarily about retiring marginal or unproductive land as a means to boost profit. CAs can ensure the people providing these services know about the services that CAs offer that can help with these issues and/or opportunities.
- Information that farmers could be receiving may conflict with Soil Health & Water Quality messaging or may not provide the full picture.

- For every aspect of farming, there is a trade-off to consider. BMPs may help one aspect (nutrient management), while causing harm to another (soil health). Important to "balance" the system and consider your end goals before zeroing in on specific practices.
- Example of conflict messaging: Many stakeholders (CCA's, drainage contractors) and conservation authority staff acknowledge that drainage is key to reduce compaction and " buildi soil health. We are working together to understand how field drainage may impact downstream systems. Multi-stakeholder projects will help to build trust amongst different stakeholders. A more fulsome understanding of the costs and benefits of some practices can be more easily understood in these pilot projects.
- Example of conflict messaging/not the whole picture: At FarmSmart, one presenter told the audience that 2019 was an extreme year and we can be assured that this weather won't happen again.
- **OPPORTUNITY:** How do we know that 2019 is an extreme year? Is there opportunity to look at the number of harvest days for the main commodities to see if there are changes in recent years about the number of harvestable days? Would it be a good idea to work with certified crop advisors and drainage contractors to evaluate the climate data. Would a more fulsome understanding of climate and soil health/water quality data better assist producers in mitigating risk? .
- **OPPORTUNITY:** Could we reach out to local farmers who are slated to speak at upcoming events and offer to help with data to supplement their presentation where available? This is a way of supporting local innovators who are promoting BMPs. The offer of support would help to build relationships with these producers. The data, slides or photos the CA provides would help to strengthen the producers messaging around BMPs. For example, if a producer is talking about a BMP that they have received funding for, CAs could enhance the presentation by including a slide about current funding opportunities. Another example would be to provide local rainfall data if the producer is planning to discuss extreme weather events.

  In these examples, a conference setting is not the venue for discussing these nuanced conversations regarding conflicting messages and trade-offs.

- Understanding your audience and their sensitivities/proclivities will help us construct our message in a way that will be well received or at least heard.
  - **OPPORTUNITY:** As many producers are uncomfortable with discussions on climate change, they are quite willing to discuss extreme weather and the chances of extreme weather becoming more prevalent.
- Because of social media like Twitter, events that happen on the other side of the Province can influence our messaging and how we interact with producers in the Lake Huron region.
- **OPPORTUNITY:** While in some ways, CAs feel like they are not making "headway", we need to remember that being invited to the table to talk at some of these events is a step forward in and of itself; an opportunity to reframe perspectives; and an invitation for further conversations.

  Finally, we were encouraged to attend a wide variety of stakeholder meetings. We did manage to attend a variety of events. Although we may have expected to hear ideas that were very much unrelated to environmental sustainability, as it turned out, environmental sustainability

seemed to be a topic of discussion at the events we attended in 2019. Agricultural organizations want to be proactive in determining environmental indicators of sustainability within their sector before "someone else does" (*i.e.,* Regulations).

- **OPPORTUNITY:** Understanding the complexities of the industry, there is an opportunity to collaborate so no one individual sector of the industry is making those decisions.
- **OPPORTUNITY:** A collaboration to set environmental indicators across the industry should be led by OMAFRA, with all sectors represented. It might be helpful if conservation authority staffcould be part of the discussions and contribute soil health and water quality indicators from a watershed (ecosystem) perspective.

Appendix 1 – Agricultural Events (not directly focused on stewardship) – November 2019 to February 2020

Date	Event	Host	Location	CA attendance
Nov 13-14/19	Municipal Agriculture Economic Development and Planning Forum	Leamington municipality, OMAFRA	Best Western Plus, 566 Bevel Line Rd. Leamington, ON.	
Nov 17/19	Ontario Young Farmers Forum	Ontario Young Farmers	Hamilton Convention Centre	
Nov 17-19/19	OFA AGM- Adapt & Grow	Ontario Federation of Agriculture	Hamilton Convention Centre	
Nov 18/19	Soil Sampling and Fertility Workshop	OMAFRA and Grand River Conservation Authority	St. Jacobs Lions Hall	
Nov 23/19	Cover crop grazing: capture the financial opportunity	Beef Farmers of Ontario	Ridgeview Cattle Co., Lambton Shores, ON	SCRCA
Nov 28/19	Nature works! Collaborative Workshops to Restore a Green Future	Carolinian Canada	Chatham Cultural Centre , 75 William St N, Chatham, ON N7M 4L4	
Dec 2/19	Waterloo SCIA AGM	Ontario Soil & Crop Improvement Association	Floradale Mennonite Church	
Dec 2-5/19	6th Annual Ecological Farmers of Ontario Conference - Climate Curiosity	Ecological Farmers Association of Ontario	Ramada by Wyndham Hotel in Belleville, Ontario.	
Dec 5/19	Forage Focus	Ontario Forage Council	Stratford Rotary Complex- Hall 1	
Dec 5/19	Essex SCIA AGM	Ontario Soil & Crop Improvement Association	St. John's Hall, Woodslee, ON, Canada	
Dec 17/19	Marketing Workshop	Innovative Farmers Association of Ontario	121 Chisholm Drive, Milton	
Jan 3-9/20	Grey Bruce Farmers Week	Grey Ag Services	Elmwood, On http://greybrucefarmersweek.ca/	SVCA, MVCA, ABCA
Jan 7-8/20	Southwest Agriculture Conference	University of Guelph	University of Guelph-Ridgetown Campus	SCRCA

Jan 8/20	Lambton Cattlemen AGM	Lambton Cattlemen's Association	Wyoming, ON	
Jan 9-11/20	Ontario Beef Industry Convention	Ontario Cattle Feeders' Association	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	
Jan 14-16/20	Dairy Farmers of Ontario Annual General Meeting	Dairy Farmers of Ontario	Fairmont Royal York Hotel, Toronto ON	ABCA
Jan 17/20	CerealSmart Conference	Farm Smart	Manulife Financial Sportsplex, RIM Park, 2100 University Ave. E. Waterloo, ON	
Jan 18/20	LSCIA AGM	Lambton Soil & Crop Improvement Association	Brooke-Alvinston-Inwood Community Centre	SCRCA
Jan 18/20	FarmSmart 2020	University of Guelph	University of Guelph	SVCA, MVCA
Jan 23/20	Ontario Farm Transition Update	Canadian Association of Farm Advisors	551 Windermere Road, London, Ontario, N5X 2T1	
Jan 21-23/20	Land Improvement Contractors Conference	LICO http://www.drainage.org/calendar.htm	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	ABCA, MVCA
Jan 23-26/20	Guelph Organic Conference	Organic Food Conferences Canada	University of Guelph	
Jan 27-30/ 20	Grains in Action	Grain Farmers of Ontario	Various locations	
Jan 27/20	Lead with Clarity: Tools for Better Communication on the Farm	Farm Credit Canada	Best Western Plus Stoneridge Inn & Conference Centre, 6675 Burtwistle Lane, London, ON, N6L 1H5	
Jan 28-29/20	Field Research Workshop	University of Guelph	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	

Jan 29-30/20	Chatham-Kent Farm Show	Chatham-Kent	John D. Bradley Convention Centre, Chatham-Kent, Canada	
Jan 29-30/20	Precision Agriculture Conference & Ag tech conference	Farms.com	RBC Place, London	
Feb 4-5/20	Ontario Soil & Crop Improvement Association (OSCIA) AGM	Ontario Soil & Crop Improvement Association	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	MVCA, SCRCA
Feb 18/20	Pre-Conference Full Day Workshop with Joel Williams	Innovative Farmers Association of Ontario	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	SVCA
Feb 18/20	Saving the Soil: A Case-Based Discussion	Ivey Business School and Lower Thames River Conservation Authority	Ivey Business School, 1255 Western Road, London ON	ABCA
Feb 19-20/20	Bring the POWER back to the soil	Innovative Farmers Association of Ontario	Best Western Plus Lamplighter Inn & Conference Centre, 591 Wellington Road S, London, ON N6C 4R3	ABCA,SCRCA
Feb 19-21/20	Ontario Fruit and Vegetable Convention	Niagara Peninsula Fruit & Vegetable Growers Association and Horticultural Crops Ontario	Scotiabank Convention Centre	
Feb 19-20/20	2020 BFO Annual General Meeting	Beef Farmers of Ontario	Delta Hotel by Marriott Hotel and Conference Centre, 655 Dixon Road, Toronto	
Feb 20/20	South Western Ontario Dairy Symposium	Dairy Farmers of Ontario	875 Nellie St, Woodstock, ON, N4S 4C6	MVCA
Feb 27/20	Precision Ag for Beginners	Grey Ag Services	206 Toronto Street, Markdale, ON N0C 1H0	SVCA

Appendix 2 - Individual Reports from Conservation Authority Staff

Cover Crop Grazing: Capture the Financial Opportunity November 23, 2019

Host: OMAFRA, Lambton Cattlemen's Association, Blair Williamson

Conservation Authority: SCRCA

What have I learned?

I learned about cattle and cover crop management by the host farmer, Blair Williamson. He began this practice to reduce the number of days his cattle spent in the barn as a way to reduce working hours and cost of hay. Using cover crops as grazing pastures and having small-sectioned rotations allows the host to provide his cattle enough grazing food until January, right before calving. Topics that were discussed in greater detail were:

- What cover crops were planted and which crops have the host farm had success with
- Fencing/ rotation arrangement – as well as conversations on ways to provide a water source
- What are the working hours like for this management
- How to approach a cash crop neighbor to build a partnership

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

The most important message I took from the workshop is the multiple cattlemen that would like to build a partnership with their neighboring cash crop farmers. This partnership with correct management would provide benefits to both parties. The cattlemen would have a longer grazing season for the cattle, and the cash crop farmer would gain soil health benefits from the establishments of cover crops and cattle manure. This relates to the goal of promoting soil health with cover crops, which increase soil organic matter, improve water infiltration and improve soil microbial activity, suppresses weeds and reduces the need of fertilizer.

Grey Bruce Farmers Week – Ecological Day – Livestream January 3-9, 2020

Conservation Authority: ABCA

Farming Cannabis in Canada – Dr. Lesley Campbell, Ryerson University

What have I learned?

This presentation gave a good overview of the history and types of cannabis, and its many uses. There was also some discussion on cannabis farms. Cannabis is seen as being beneficial to the soil because of its large taproots that break up compaction, and it prefers nitrogen rich soils. However, overproduction of CBD as a focus is not great economically. It is better to have diverse uses for the plant to make it a viable farm crop. The hemp industry could be great economically, but the facilities for production are just not available in that scale yet.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- This presentation brought forward the economic side of the agricultural industry, and specifically showed the pressures associated with cannabis farming
- The message about diversification with respect to cannabis production can be applied to other soil health. There will not be one solution to improve soil health and water quality, but rather a systems approach will be necessary.
- Messaging related specifically to cannabis production could be applied, but the specific discussion around the plant is probably not as relevant to the majority of farmers and industry that we work with.

Profitable Organic Cash Crop Organizations – Brett Israel and Fiete Suhr

What have I learned?

These discussions tended to focus on the economics of organic farming. Brett Isreal had four main points: know the costs, add value at every step in the operation, move towards a closed loop, and invest in the soil. He spoke at length about having a "closed system approach" to his farm. For example, he feeds the soil with manure, which feeds the crops, which help to feed the pigs, which produces more manure to feed the soil. He also discussed the 7 Generations Decision Model, which means that he looks at what the impact of his decisions will be for the next seven generations of his family. One of his key points was that you can't place short term profits over long term sustainability. He also talked about the negative impacts of tillage and how you can start to incorporate less tillage into your organic operation.

Fiete Suhr said that you have to go into organic farming with a different mindset than with conventional farming. Profit cannot come first, but rather the ecological, sustainable, and environmental benefits. He did not see the benefits of using less tillage and believes it is necessary in organic operations, not only for weed control, but also to plow in living green crops (cover crops).

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Brett Israel's messaging was very complementary to our objectives. His systems approach and 7 Generation model fit very well with BMP implementation and improvements to soil health and water quality.

- He is innovating in organic farming and making what we would consider traditional BMPs to conventional farms viable options for organic operations. His idea of slowing introducing ways to reduce tillage helped him manage the risk, which is what we hear from many farmers.
- Fiete Suhr's messaging was less similar to what we try to achieve, but he did bring up good points about changing the farming mindset from an economic focus to an ecological focus.

Telling Your Farm Story – Amy Kitchen, Sideroad Farm

What have I learned?

Amy's presentation focused on effectively using social media for marketing, and listed many reasons why it is beneficial to use social media. These included: creating a personal connection with the community, increasing sales, adding value to a product by telling a story, opening up new markets, increasing transparency, and promoting what you care about. Her key points were to really think about who you are trying to reach with your posts, as that will change the way your think about your messaging. She also noted that we should post photos of ourselves and how important it is to let the public know who you are. She also noted how important it is to have good photos - this is what people want to see. Additionally, she noted how important captions are – they need to be concise, but also tell our story.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- I think Amy's messaging goes hand in hand with what we as individual conservation authorities and as a Healthy Lake Huron group want to promote. The wise and effective use of social media could go a long way to helping the community build some trust into our efforts and messaging.
- I think it's also important for agricultural organizations to take advantage of social media platforms. Individual farmers often do a good job (especially on Twitter), but perhaps not the larger organizations?
- It's especially important to get the word out when we are collaborating with other organizations and sectors – it lends credibility to our messaging.

There were two other presentations during this day of Farmer's Week; however, I was not able to listen in to them as closely. However, one specific point during Dr. Scott Gillingham's presentation on Raising Amazing Chicks stood out – "you cannot manage, what you do not measure." I think this is really a key message that can be adapted to Healthy Lake Huron efforts and collaborative efforts between organizations from different sectors.

Key Opportunities:

1. Realize that there are economic pressures that all types of farmers face. We tend to look at the environmental benefits of BMPs, but there are other factors that go into the decision-making process that might have a greater importance to the farmer.
2. Organic farming systems have not always been on the CA radar as they have different needs than conventional farms. However, it was clear that many of their approaches can fit well with CA objectives – they are an untapped resource.
3. We can be more effective in using alternate media sources to get our messaging to those who might need to hear it. The effective use of social media can help with providing transparency and help make connections to ag industry.

Southwest Agricultural Conference, January 7-8, 2020

Conservation Authority: SCRCA

Real Corn Growers

What have I learned?

- Jeff Cook- Mapleview Farms: Looked at a US study that found that using tracks causes less compaction compared to tires. Jeff personally observed less pinch row compaction and better corn uniformity. He also emphasized the importance of the right (corn) genetics for the right field and using a specific GPS program. As a result, Jeff found a $20-25 profit/acre.
- Strang Farms: Best management practices that have been incorporated in their farm are strip-tillage/no-till with twin rows, cover crops, interseeding and planting green. Also suggesting have a multi-hybrid variable rate (having a racehorse and working horse variety) application
- Donkers Farms: They implemented a fast-rate seeding planter for better emergence and fertilizing nutrients for what you need

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Incorporating measures to build soil health played a huge role in providing strong corn yields, mainly through the reduction of compaction and building organic matter. These presentations promote that implementing BMPs will help with crop yield and uniformity. We can work with corn growers that implement such measures to communicate with other corn growers, the benefits of incorporating the soil health perspective when planning out their crop year.

Blast from the Past

What have I learned?

Larry Cornelis discussed North American history where there was approximately 30-60 million Native Americans (same population as Europe at the time) before the European settlements who have been around for 9-10 000 years, after the last ice age. The first European settlers wiped out 90% of that population by bringing disease. Before the settlers, the Native Americans did not change the landscape, but maintained it**.** European settlers spoke how the St. Clair/ Detroit River watershed were meadows and fruit trees- those are not actually naturally meant to be there, but that the North Americans maintained it by fire, or through the movement of buffalo. European settlers deforested, hunted away species to endangerment or at risk when there were populations of billions (e.g. passenger pigeons). A lot of clear cutting due to how successful the timber industry was (estimated to be $60 000 000 during the 19th century). Due to European management styles, tree diseases are becoming prominent and effective at killing species. Oak wilt disease is occurring across the St. Clair/ Detroit River watershed and canker disease for black walnuts is in Pennsylvania and Ohio. Canada has the highest rate of forest loss/ disturbance in the world (3.6% annually).

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Bringing awareness to pre-settler ecosystems can promote messages on the benefits of tree-planting BMPs and how trees do not necessarily hinder agriculture.

Beyond the Hype

What have I learned?

A panel with Cam Ogilvie (University of Guelph), Anne Loeffler (GRCA), Tori Waugh (OSN) and Marty Vermey (GFO) spoke on costs and benefits of cover crops. Marty Vermey spoke on the hard costs and soft costs (such as yield loss) of cover crops. He spoke on the revenue of cover crops which include: soil health, grazing, weed control, OM and nutrients – all have intrinsic monetary value except for erosion repairs, OM, nutrient sequestration, which was considered to be priceless. The cost-benefit analysis found that net returns in the first year is $10/acre, then in 5 years being $29.50/acre, in 10 years was $55.90/acre, 25 years was $75.28/ acre and at 50 years of cover crop incorporation being $336.39/acre.

Rye as a cover crop was found to reduce glyphosate-resistant fleabane (rye? works well before soy). There was a 25% yield loss when rye was planted before corn, even with manure. However, there is a marketable yield with using rye as a cover crop for vegetable crops. In conclusion, cover crops pays in Ontario through minimizing herbicide resistant weeds compaction, and moisture deficiency, easing the transition to no-till, and providing opportunities for grazing and incentive payments.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Planting cover crops is a BMP that CAs promote to provide benefits to soil health and crop productivity. A better knowledge on quantitative and economic values on the benefits of cover crops will send a greater message to promote the use of cover crops and thereby improving soil health.

Terrific Tires

What have I learned?

I learned that the recommended road tire pressure is 30 PSI and the recommended farmland tire pressure is 17 PSI. There were three different tire brands that were described that aid in reducing soil compaction:

- **Ultraflex**: sidewalls will flex, more expensive to purchase but less costs to compaction and to your time. There is IF (increased flexion) which has the same air pressure and 20% more load and VF (very increased flexion) having 40% more load. There is a 4% increase in yield with ultraflex.
- **PTG wheels**: 10% in fuel savings, 6% increased yield due to the reduction of soil compaction
- **Evobib:** for inflation
- In future, there is hope for sensors in tires to detect axle loads and changes in ambient temperatures.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Having the right tire pressure on farmland is important to reducing the risk of soil compaction. This is a message we can send to farmers and CCAs as a soil health BMP. Compaction reduces yield, which reduces potential revenue. If we can achieve soil health by framing it with an economical perspective, there may be better buy in.

Capturing Carbon

What have I learned?

Dr. Adam Gillespie and Anne Verhallen (OMAFRA) spoke on carbon cycling and defining organic matter. They discussed a paper by Kallenbach, C.M., Frey, S.D., and Grandy, A.S. (2016). Direct evidence for microbial-derived soil organic matter formation and its ecophysiological controls. Nature. DOI: 10.1038/ncomms13630. In the study, pottery clay substrate was bought and then inoculated with microbes. The microbes were fed sugar. Within 15 months, organic matter (OM) and aggregation were exhibited, suggesting that when microbes die on the clay substrate, it adds protection and builds organic matter. There was a flow of microbial activity creating microbial biomass, stabilizing around the clay particles. The study suggested that aggregates change quicker than we thought. I learned that carbon pools are not static, building OM for flow similar to reservoirs for dams. Three types of OM: DOM (dissolved), POM (particulate) and MaOM (mineral-associates) (necromase). POM doesn't have carbon saturation like MaOM does, therefore, adding residue has no limits.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Organic matter and carbon are important components to soil health and provide a measure of soil quality. CCAs spreading messages on the cycling of organic matter and practices to capture carbon is important on our end for improving soil health as well important for crop productivity for the agriculture sector.

Wacky Weather

What have I learned?

This presentation spoke on overall trends, recent weather trends and what weather modelling is predicting to happen in the future. In May, on average, rain events are usually every 3-5 days (so approximately 11 days in the month). However, May 2019 had 23 days of rain, double to the average rain events. The London station measured 200 mm in surplus of precipitation during the month of May. Furthermore, the average temperatures have increased in the past 4 decades, but has become more stabilized in the past decade. A reminder was made that that winters during 2013-14 and 2014-15 were the most severe winters bringing an outlook to the drastic difference in the winters compared to 2019-20 being much warmer. As a Michigan resident, he mentioned the growing season there has been the wettest for Michigan since 1895. As well, 4 of the 5 wettest growing seasons (April to June) occurred since 2011, with Sept- Nov of this year being 115 mm above normal. Weather modelling predicts that there will be a decreasing summer precipitation variation and jet streams acting as atmospheric rivers will be changing the weather.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Future weather trends are important for the agriculture sectors to the future of their growing season. Higher precipitation has already affected the planting and harvesting seasons the past few years. Incorporating recent research on future weather trends to growing seasons emphasizes the need for BMPs and to improve soil health to reduce the implications (on crop yield) that will come from predicted weather changes.

Farming for Carbon

What have I learned?

The presentation spoke on the 6 steps to build carbon in your soils: 1) Compaction reduction, 2) Conservation tillage, 3) Crop diversity- through photosynthesis (winter wheat, rye), 4) Cover crops, 5) Composts + carbon amendments and 6) Continuous living plants. Farmers spoke on their operations speaking on how red clover cover crop increased corn yield by 6 bu/ac and winter wheat increased yield of soy by 4-6 bu/ac and corn by 6-17 bu/ac. When implementing cover crops and processing vegetables, there was a 7.6 to 16% greater profits but for grain crops, it was found to reduce profits by 6.7 to 13%.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

The 6 steps involved to building carbon are or can be incorporated as BMPs. The goal to building soil carbon is also a goal of increasing soil health. Possibly speaking on the message that these 6 steps building soil carbon will provide the results that CCAs want with the implementation of BMPs and improving soil health.

Key Opportunities

- With increasing monitoring of the Great Lake Water System, the CCAs could use the data to speak on the watershed perspective to enhance the message to promote BMPs
- Using studies and the monitoring on future weather patterns to speak on the need for soil health and BMPs to reduce the growing complications the weather has played to the growing season
- A need for cash crop/ cattlemen relationships to allow cattle grazing and cover crop implementation is something the cattlemen would fine beneficial and CCA's can look towards aiding as it promotes BMPs and increasing soil health

Dairy Farmers of Ontario, Annual General Meeting January 15, 2020

Conservation Authority: ABCA

Ernie Hardeman Minister of Agriculture, Food and Rural Affairs, OMFARA

What have I learned?

Bill 156 open for business. The Government listened to farmers and reduced red tape.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Attending this presentation reinforces the perception that Government is only about regulations and then getting rid of regulations.
- Certainly, the implementation of BMPs is not a regulatory concept but perhaps in the mind of some people there is fear that they will be required to undertake practices that impact their bottom line.
- I am not sure how we will embrace the complexity that is the implementation of more BMPs under a black and white scenario of regulations or no regulations.

Murray Sherk, Chair, Dairy Farmers of Ontario (DFO)

What have I learned?

The Chair of the DFO welcomed the attendees with a speech that highlighted global issues and a shifting consumer base. Mr. Sherk acknowledged that citizens of the world were having to come to terms with sustainability in light of climate change. He recognized that the dairy industry was well placed to reduce environmental impacts. A couple of cautions were mentioned. With Canada US Mexico Agreement, Canadian Dairy producers have lost 3.9 % market access (18 % with other trade agreements). Although, grateful for compensation, dairy producers cannot sustain further trade concessions. With low returns to dairy farmers in the US, 800 farms in Wisconsin were lost in 2019. We have greater stability in Canada, however we must continue to adapt to consumer needs. Conflicting desires for consumers (*i.e*., clean label and alternatives to meat) means meeting their needs might take innovation and new products. Furthermore, the retail sector is concentrated in Canada and the processors seem to be squeezed. To make dairy an "inspired food choice", DFO plans to build on consumer trust and credibility by promoting proACTion. A program that has criteria on biosecurity, livestock traceability, animal care, and environment.

Interestingly just prior to the AGM, the Directors of the Dairy Producer Committee in Glencarry County quit in response to the perceived top-down approach to delivering proAction. I heard these sentiments in the corridors of the meeting, I also heard that proAction was going to cost producers (*i.e*., third party verification) but there would be no benefit (*i.e*., the price of milk is not going up). Furthermore, some Dairy Producer Committee groups had heard from some of the producers that had come from Europe that were familiar with these kinds of programs and left Europe to farm with out regulations. These "new to Canada farmers" explain the regulations to their Canadian counterparts that leave many producers wondering "where it (*regulations*) will stop".

With all the changes, Murray Sherk recognized that the DFO will need strong leadership which he defined as anticipating what is needed in the future and moving in the correct direction. This will be accomplished by working with the Dairy Producer Committees, Dairy Processors, the Provincial Board and national organizations and governments.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- First, it is very important that issues such as environmental sustainability are being discussed as a priority at this meeting. I have attended this meeting in the past and environmental sustainability was not mentioned.
- The opportunity I saw while watching this presentation was to ensure that soil health and water quality BMPs are well described in proAction. Environmental requirements for proAction are under development with an expected validation date of September 2021. Currently the sole criteria in proAction is a requirement to have completed the Environmental Farm Plan. It will be important that the recommended practices reflect true soil and water conservation requirements.
- It seems that it will also be important to bring many people along on this conversation. There is some recognition of sustainability in the dairy supply chain and that this may mean different things to different people. I am curious about the capacity to understand the consumer's perspective. I think it might be important to maintain a consumer-based perspective. This might be challenging – some of the concepts are confusing, it will be helpful to be clear that there are different indicators. In the longer term, more clarity around this process might help to explain the trade-offs that are apart of environmental sustainability for different farmers and conservation experts. I feel there is a need for a leadership role from OMAFRA. There seems to be many different commodity-led sustainability programs. At some point "apples will need to be compared to apples".
- I am not sure what role the conservation authorities can have other than supporting our farm organizations with understanding the importance of true conservation measures – longer rotations, more vegetative cover on the landscape, less tillage, etc. It may also be important to contribute to the conversation about the scale of effectiveness of BMPs. I recognize that participating as third party certifiers is beyond our conservation authority mandate however, a collaboration of industry and conservation organizations, that understand that practices can impact at different landscape scales, would benefit (authenticate) the verification system. Finally, it will be important to continually acknowledge the good work being done on Ontario farms (dairy and other).

Dairy Sustainability – Sara Place, Chief Sustainability Officer, ELANCO

What have I learned?

Dr. Placer explained the Sustainable Venn diagram, with overlapping circles of social, environmental "hoofprints" and economic systems. The "indicators" that are considered for each of these circles are numerous. For instance, under economics are we going to evaluate producer's bottom line or are we interested in contributions of farmers to rural economic systems, or food affordability. There will be a different list of values or priorities, depending on your perspective. This is complicated and it will not become easier. It is recommended that the beef industry put their "stake in the ground" and determine what their priorities are and then demonstrate how your industry is working to check the boxes.

The world is complicated and right now people in the room are perplexed and concerned by the simple solutions – eat vegan – that seems to be the response to complicated issues such as climate change. Dr.

Placer spent some considerable time explaining how feed conversion efficiency, the use of land that is unsuitable for cultivation, greenhouse gas efficiency and the recycling of food processing by-products make beef an "upcycling superpower". In short, because we cannot eat our way out of climate change and we would not have enough micro-nutrients in a plants-only-based diet, we need to tell the more complete story of the importance of beef in our diets.

Dr.Placer noted that there already are lots of conversations about food and "you have to be there", as a part of the conversations. Right now there is an "us and them" sentiment, and this is taking us to simple, inappropriate outcomes "eat vegan". "The world is complicated messaging is important".

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- The messages from this presentation have the potential to align with messaging around BMPs, particularly the importance of hay and pasture in the rotation.
- "The world is complicated messaging" is important for us, as well.
- There is an opportunity for CAs to provide the information about conservation values if we are invited to the table. If we are not included in these discussions, than I feel that there is the potential for the indicators around economic sustainability alone will be more valued.

Dairy Processing Today – Mark Taylor, President and CEO Lactalis Canada (Parmalat)

What have I learned?

Mr. Taylor provided a glimpse into the perspective of the agricultural industry from the processors perspective. Although, 98% of Canadians have Lactalis products in their refrigerators, it seems that this company is feeling squeezed between supply management for producers and high listing fees for some retailers. The repercussions of less profit for the processors is that there is less research and development, less consumer choice, and reduced sustainability to the industry. Even though Lactalis is one of the biggest processors (the top five processors have 82 % of the market), Mr. Taylor acknowledged that it is not good for the industry, "it is important to have small and medium sized processors, it keeps everyone honest".

Mr. Taylor explained that in the UK, the disparity in the profit margin for dairy supply chain was addressed with legislation, the Grocery Code of Conduct. This legislation has been enacted since 2013 and has provided win-win outcomes. The legislation covers: fair dealing, variations of supply agreement, changes to supply chain, no delay in payments, sustainability, efficiency from farm to table, and innovation. This guidance helped manufacturers to take the long view and focus on the right things for the supply chain and not just moving profits from one part of the supply chain to another. For example, the current situation for fluid milk in untenable. For producers, the preferred product is milk. For the processor, milk consumption is down and they need to develop new products. From the government perspective, it would be fair to acknowledge that plant-based beverages are not milk. The lack of appropriate labelling on these beverages has not helped the nutrition for people or the dairy industry.

Lactalis acknowledges that the supply management system is good for producers but it has weaknesses: how do we mange a model that does not include all participants in the supply chain? How will supply management evolve in the face of increase external competition for the domestic market? Consumers are worried about the cost of living. Things are changing and a unifying approach will be important.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- I am not sure how the criteria around sustainability in the Grocery Code of Conduct for the UK are defined. This might be worthy of some investigation.
- The focus on economics is relevant and needs further understanding from field to table to lake.

Chief Executive Officer Remarks – Cheryl Smith, Chief Executive Officer, Dairy Farmer of Ontario

What have I learned?

In light of the changes that are facing the dairy industry, namely changes to supply management, consumer choices, and processor sustainability. Ms. Smith outlined system, consumer and organizational "readiness" programs that DFO will be undertaking. In particular, DFO is prepared to:

1) review how imports will affect the milk management system;
2) support a market and business development team to develop "inspired by choice" to focus on the health benefits, versatility and great taste of dairy; and
3) listen to counterparts in the supply chain to resolve differences.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- With environmental sustainability being important to consumers, it is important to acknowledge the complexity of BMP implementation. For starters, there is a hierarchy of BMPs. It will be important to better articulate the pros and cons of BMPs to the producer and to society. Better BMP evaluation data will help.
- The messaging that DFO is focusing on "inspired by choice" with its focus on health benefits, versatility and taste are not related to environmental sustainability. I am certain that they have conducted extensive marketing research so it could be that environmental sustainability has yet to be incorporated into the DFO brand, despite the focus on the topic at today's meeting.

Key Opportunities:

1) Acknowledge the competing interests that producers are trying to meet as they attempt to make their livelihood.
2) Work with commodity groups to help them understand the hierarchy of effectiveness of Best Management Practices so that relevant conservation approaches are considered when "environmental sustainability" indicators are incorporated into industry-led reporting.
3) Support local producers and programs that are interested in better understanding the complete spectrum of sustainability.

Lambton Soil and Crop Improvement Association AGM, January 17, 2020

Conservation Authority: SCRCA

Marketing Outlook – Floyd Howard (Wanstead Farmers Co-op)

What have I learned?

The presentation spoke on current and future prices of grain. I learned that the largest factor in today's grain markets is the new trade agreement between China and US. There are concerns if China will reach the agreed upon importing amounts, after 300-350 million of livestock pork were lost to African Swine Fever, which is approximately a quarter of the global pork supply. The loss greatly reduces the amount of grain needed for import to feed livestock. I learned that even with a successful growing season and producing a good yield, the global market ultimately determines how the farmer will benefit.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

A weak market for grain may cause a producer's soil health incentive to change. A producer who may typically implement crop rotation, may change practices if the market favours one crop year after year. Incentives for soil health practices may be better received if the market is not strong.

Producer Panel – Wheat Winners (4 Lambton growers)

What have I learned?

The panel had 4 Lambton growers speaking on their wheat production. Topics of discussion included what and when to fertilize and how to reduce the number of passes in a field. Two of the farmers have digital mapping of their wheat yield to better understand their land and nutrient management. The largest thing I took away from the panel, was that most farmers dislike growing wheat because it is not a strong market. However, the farmers acknowledge the benefits the wheat give to the yields of corn and soy and how it nicely fits into a rotation.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

The panel allows the discussion of crop rotation and the soil health benefits that adding wheat into the rotation has, as well to producing better yields for corn and soy. If producers can be convinced of the long term benefits of winter wheat in the crop rotation beyond an immediate monetary benefit, maybe local farms will have better soil health.

Maximizing Seed Traits on Your Farm! – 4 Seed Companies

What have I learned?

New corn and soy varieties were discussed. The varieties were designed to protect against some of the current pests, diseases and weather. All 4 seeds companies had seeds similar in the chemical formation for the same actions. The seed companies stressed about planting seeds with more than 1 mode of action for the crop roots to prevent damage to your crop yield. There was also some discussion on drought-resistant crops, and how there are a type of seed that exists, but they remain concepts in development.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

Soil health benefits can add to crop yield, but yield is still affected by other factors such as pests, diseases and poor growing seasons. Therefore, picking the right genetics is not determined by soil health issues but rather, pests and diseases known to be issues. Nonetheless, with respect to the concern over drought-resistant seeds and crops, promoting soil health benefits as a way to increase water infiltration into the soil, could alleviate some of the climate stressors for producers.

FarmSmart 2020, January 18, 2020

Conservation Authority: MVCA

Market Outlook – Steve Duff, OMAFRA

What have I learned?

I gained a better understanding of how crop and livestock prices are influenced by policy decisions in other countries. USA tends to offer few ad hoc programs to stabilize farm income outside of the Farm Bill. Ontario would prefer that it stay that way. USA agreement with China means that China will be purchasing more USA exports for the next two years. Steve expects steady prices for soybeans in the coming years as a result. Demand for meat is growing globally. Ontario has lost some of its slaughterhouse capacity. Returns for Beer and Pork are not great if needing to purchase feed. Highlights are that producers should manage their risk by participating in risk management programs, look for efficiencies, use marketing tools, and reduce debt.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Attending this presentation will help me because it is beneficial to understand the economic pressures facing producers.
- The key messages about managing risk, can be incorporated into messaging regarding soil health. As other presenters have stated, improving soil health helps to weather proof your yields. Many of the practices promoted to improve soil health, also help to manage risk (crop rotation, building organic matter etc). However, this was not mentioned in Steve's presentation as a way of managing risk.
- The messages presented by Steve Duff did not conflict with our messaging around soil health and water quality and I believe they could be incorporated.

A Year in Review: Lessons from the Turmoil of 2019 – Matt Rundle, Harriston Agromart; Sharon Vogel, Thompsons Ltd.

What have I learned?

Sharon and Matt walked through challenges they and their customers were faced with and the decisions that were made using the best info at the time. This presentation really highlighted for me how difficult of a farming year 2019 was. The challenges with the spring being so wet, followed by a drought, followed by delayed harvest. Producers were in their fields working when they knew it was too wet, but felt they had no choice. #2019'd.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- The opportunity I saw while watching this presentation was to help CCA's understand climate change risks, so that they themselves can relay this information to farmers. The presenters said multiple times that 2019 would "probably never happen again". However, 2019 challenges are exactly what is being predicted to occur with climate change, and therefore should be communicated as the new normal. CAs could offer to share their observations of climate trends with local CCA's, perhaps through lunch and learns.

- The presenters did talk about the need to manage risk and soil health was mentioned as a way to reduce risk.
- Drainage was mentioned as very important to soil health. In fact, it was mentioned as a key practice in almost all the presentations I attended. It is important for CA staff to understand that professionals the producers trust are telling them that improving drainage is extremely important to improving soil health, reducing risks, profitability etc.
- The messaging in this presentation does not necessarily conflict with CA messaging, but it could be improved by providing CCA's with information around climate trends and predictions.

Seeking Sustainable Crop Production Using Strip Till and Bio Strips in Corn – Allan Willets and Lawrence Hogan, North Huron Farmers

What have I learned?

This presentation highlighted the complexity of adopting and new systems. It clearly takes a high level of commitment. Managing residue ahead of planting corn is particularly challenging and Lawrence and Allan have both been working on fine-tuning a system that works for a many years. After wheat, the straw is bailed and strips are planted (Two rows high carbon, two rows low carbon species). Corn is planted into the rows of low carbon cover crop species as they have fully broken down over winter. Residue must be spread from the combine properly. A separate Row cleaner unit is used ahead of the planter (1-2 days before) and spiked closing wheels are used on the planter.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- The key messages from this presentation align perfectly with messaging from the CA.
- There is an opportunity for CAs to support their local farmers when they are scheduled to present to other groups. In this case, the producers could have included local rainfall data, or information about local funding programs in their presentations. The producers did mention weather events, and the local grant programs casually in the presentation. This was an opportunity that MVCA missed.

Precision Agronomy Foundations…Where to start and how to engage – Tony Balkwill, Nithfield Agronomy and Dan Breckon, Grand River Planters

What have I learned?

The speakers described how the approach to precision ag has evolved. Initially they were grid sampling and smoothing/averaging to come up with prescriptions. This was missing a key part of the picture. Now they focus on identifying soils to the level done in the county soil maps, and generate prescriptions based on soil classification. Some soils, just do not have the ability to hold nutrients, so why over apply these areas? Creating prescriptions, this way is saving their clients money. The speakers highlight profitability mapping they can provide their clients. They are locating areas that require different soil conservation methods like cover crops, and possibly to be retired all together.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Profitability mapping will potentially identify areas in fields where soil conservation (tillage, cover crops) are required. The mapping could potentially identify areas that could be retired, or areas that need improved drainage to be profitable.
- The messaging could be incorporated into CA messaging. CAs should be ready to offer solutions for areas that are being identified as low profit or losing producers money. CAs should look for solutions that work on farms. Perhaps, solutions that do not overly complicate management, create weed pressures, or permanently take land out of production as these are less likely to work for producers.
- CAs should explain their services/expertise to CCAs/Ag businesses who offer this mapping service, so that they can direct their clients to the CAs if potential projects arise. Eg. “this area is losing you money, consider talking to the CA to create pollinator habitat on this slope section”.

Key Opportunities:

1) Work with CCAs to help them understand climate trends so that they properly communicate risk to producers
2) Support local producers who are presenting to their peers so that they have good data and correct information on local programs
3) Develop solutions for areas identified as losing producers money and share these solutions with Ag business who provide profitability mapping to producers

FarmSmart 2020, January 18, 2020

Conservation Authority: SVCA

Phil Needham – Opticrop Manager, UK

What have I learned?

I learned how the position and system associated with the tractor are integral to seeding process; Position of fertilizer is key for seed growth as is soil to seed contact. There are many things that the farmer needs to consider as they get ready to plant for the spring both on and off the tractor. Good conversation and learning points on soil moisture and clay components. I learnt about the cutters relative to the soil closers, and cultivators. Good discussion on the cultivators after seed in the ground, how the spiked ones are preferable, but may provide their own challenges.

I leant how the increase in temperature with cleaning off the seed site is really beneficial to the planting process, together with the chain that follows to be sure the crack is filled.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

YES, I believe having a better understanding of this process and how the seeding processes is individual/equipment dependant, with recommendations to No Till and how can overcome some of questions on till versus no till. Being able to say that residue is ok, and that having the chain on the back that clears off some of the residue to allow the soil to get warmer. However, I also learned that using the spiked cultivator may present a problem in thick cover crop scenarios too. The challenge with minimum or no till into moist soils, closing the seed slot becomes a problem with the cover crop. This could affect/influence the use of cover crops and seeding if they are unable to overcome the equipment challenges, stay on top of the challenge and just go back to tilling to overcome.

Land Improvement Contractors of Ontario Conference, January 21-23, 2020

Conservation Authority: MVCA

Tile Drainage in India – Jim Tait

What have I learned?

I gained an understanding of Jim Tait's project of installing tile drainage in India. There were many challenges bringing the equipment over and lots of bureaucratic hoops to jump through; took a month to ship the equipment by sea. Lots of corruption and his expensive equipment stuck out like a sore thumb.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Not too relevant to our messages, but interesting challenges associated with bringing "high-tech" solutions to an area with lower capabilities.

Drainage Innovation at Huronview – Mel Luymes

What have I learned?

Mel explained the drainage innovation project at Huronview consisting of systematic, contoured and controlled drainage. Also features terraces that are similar to berms without inlets. They had great success with collaboration, which lead to lots of press and a visit from the Minister of Ag. Mel brought up the contractors from Roth Drainage to discuss technical aspects and their experience with the project. Roth discussed the unforeseen challenges of the contoured drainage installation, such as their equipment being too big for the turns on the contour lines

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Target your message for your audience – for example Mel began the presentation praising drainage and said "if you ate today thank a drainage contractor".
- Workshop featured practical components – such as installation of tile drains
- High success of collaboration – lots of press and Minister of Ag attended workshop
- Have the experts speak for themselves – Mel brought up Roth Drainage to explain the more technical aspects

What Ontario Research is Telling Us about Tile Drainage – Merrin Macrae

What have I learned?

Merrin Macrae presented some findings from her research related to tile drainage. She challenged the preconceived notion that Phosphorus loss only occurs through overland flow and explained how the portion of dissolved reactive Phosphorus can be lost through tile drains. However, she did say that even if you only have a small amount of overland flow it can contain most of the Phosphorous that leaves the field (which demonstrates a environmental benefit of tile drains).

She demonstrated how a lot of Phosphorus lost is dependent on the field conditions, topography and weather. However, one of the main causes of Phosphorus loss is high soil P levels. There comes a point whereby soil cannot bind anymore phosphorous (ie: the sponge is full). Furthermore, although

practically every field is “leaky” for phosphorus, data has shown that one field with manure on snow can lose more Phosphorous than 18 months of the rest of the sub-watershed combined.

Lastly, Merrin discussed the challenges of competing BMPs – what are your goals; reducing nutrient losses or soil health? Best practices for reducing nutrient losses would be incorporating manure/fertilizer; however this has negative impacts for soil health. However, she reiterated that regardless of incorporation with tillage, soil P levels will ultimately dictate any P losses from that field.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Always difficult to transfer technical/scientific data to non-academic audiences. Merrin used a lot of practical examples to transfer ideas. For example, when discussing how a flooded cover crop field may contribute to Phosphorous losses, she explained how the flood waters were similar to a tea steeping; the longer it sat the higher the concentration of P.
- Try to not overload audiences with data or information. They will only be able to retain a couple key points so focus on those key points.

Runoff or Infiltration – Structure Matters! Anne Verhallen

What have I learned?

Anne provided an “indoor” demonstration of rainfall infiltration. Although I’ve done my own rainfall infiltration demonstrations there was still much to learn. Anne described how the intensity of rainfall is an important factor to consider – must reflect real-life conditions and relate back to how farmers discuss rainfall (eg: 2” rain overnight). I think the most relevant point of her presentation was the role of soil health (specifically soil structure) has on water infiltration and drainage. Tillage has significantly reduced the ability of Ontario soils to infiltrate rainfall and thus producers are tiling their fields at closer and closer spacing to make up for it.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Anne said that OMAFRA is willing to bring out their rainfall simulator to workshops and events, just need to give her a heads up.
- Find common ground with your audience. Anne’s point of reduced soil structure leading to the need for tighter spacing was emphasized from a financial standpoint. Tile drainage can be very expensive and improving infiltration through soil health is cheap in comparison. However, many of the drainage contractors in the audience are in the business of selling/installing tile drainage
- Trade-offs of BMPs. Anne discussed the role of earthworms in soil structure and how even after 2 years of no-till beans/wheat there can be extensive macro-pores in the field. For me, this has implications for liquid manure application – as seen in the Garvey-Glenn edge-of-field site.

Sufficient Outlet – Greg Nancekivell

What have I learned?

Greg discussed some of the challenge for drainage engineers and contractors to find sufficient outlet for new or upgraded tile drains. He discussed some of the laws regarding tile outlets and the issues that arise when changes are made upstream and the legal ramifications. For example, many private and municipal tile outlets have been “grandfathered” in to drainage law. This leads to scenarios whereby

insufficient outlets (ie: “dumping water onto a neighbor’s property”) becomes institutionalized over time. However, any changes to these drainage systems (adding tile lines or tighter spacing) changes this precedent and a more appropriate tile outlet is required. If absolutely no tile outlet is available, another option is the dump the water onto a property and compensate them for any damage/flooded land, this can be written into the drain report.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Background knowledge on sufficient tile outlets and drainage legislation is important for CA regulatory staff. But may not be very relevant to CA objectives of soil health and water quality promotion.

Fisheries Act Changes – Chris Biberhofer

What have I learned?

Chris provided a high-level presentation on recent changes to the Fisheries Act. There was not much practical information from a regulations or stewardship standpoint. My interpretation was that the recent Fisheries Act changes were basically reverting previous changes made under the Harper government. Chris mentioned the “duty to notify” of projects that need DFO approval. He said it is the “person responsible for the work” that has a duty to notify DFO. Lastly, Chris provided a guide for submitting applications and photos to the DFO. Make sure to include photos of the drain substrate and surrounding vegetation, as well as pictures of water – whether flowing or standing (also good to include a key map showing where the pictures were taken).

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Presenting policy can be very challenging and it is hard to be engaging. I think it is very important to sprinkle in practical information, which gives context to the high-level discussion.

Maintaining Private Ditches – Chris Biberhofer

What have I learned?

This presentation was very similar to the previous DFO presentation that Chris delivered. There was little relevant information presented. After the short presentation, Sid Vanderveen asked some pointed questions regarding private drains that has relevancy, such as “if someone is cleaning out a private ditch that dries up in the summer do they need DFO approval”? Chris said likely not, but always best to check with them first.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Not really possible to incorporate into CA messaging because more-so related to regulation

From Conventional to Contour Pattern Design: the Pros and Cons – Jeremy Mieners

What I learned?

Jeremy discussed some of the challenges associated with contour pattern design: more expensive upfront, more complex and requires attention to maintain (changes to control boxes). Can be difficult in

fields with a lot of slope because that means more control boxes. However, there are many benefits with consistent and even drainage across the field.

Is it possible to incorporate these messages into my objectives of promoting soil health, water quality and BMPs? Why or why not?

- Everything has a trade-off to consider. BMPs may help one aspect (nutrient management), while causing harm to another (soil health). Important to "balance" the system and consider your end goals before zeroing in on specific practices.

LICO and Drainage Superintendents Assoc. of Ontario, January 22-23, 2020

Conservation Authority: SVCA

Innovation at Huronview, Mel Luymes

What have I learned?

Details about the project at Huronview were provided. Mel provided the complexity and objectives of the project at Huronview. How to implement and monitor water in contour drainage; how to overcome slope and drainage in more unconventional way. Discussed the control points installed, monitoring as well as wetlands for outlets. Successful project with many partners across agencies as well as across contractors working with Ag drainage. I learned that there is a possibility to control the drainage on slopes 2-9% along slopes versus perpendicular to slopes and with soils other then sandy, as was the case in eastern Ontario. The logistics of the installation seemed to be a challenge but was workable as the project was completed. It was interesting to hear the details of the installation, having to keep the depth at .1% seemed to be critical to the control tile drainage to work.

I felt that the demonstration site seemed to be relatively expensive and provided some challenges for equipment keeping the contour tight as well as at the .1% grade. However, with time, the hope would be that the installation challenges could be overcome and efficiencies gained.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

Being able to convey the project to landowners to tell them that there is a demonstration site that is looking at control drainage will be good. To let be able to share that they are monitoring water quantity and quality at the demo site to watch. Having this pilot project in our area is a real advantage. Ag community will want to know what the real situation is in soils/climate similar to what they experience versus eastern Ontario. Advantage to contractors involved in installation for fine tuning design and trouble shooting. Huge point to be able to discuss wetland at end of the tile outlets. Time will tell and with monitoring results to show/share the improvement to water quality based on the various BMPs that are installed.

What Ontario Research is telling us about Tile Drainage, Dr. Merrin MacCrae

What have I learned?

Overview of Phosphorus, pathways of P reaching tile water, reaching surface water, a good understanding of reactive phosphorus and dissolved phosphorus. I learnt about the preferential pathways of water flow carrying P to the the tiles. Tiles are showing to be a conduit for P to reaching the surface waterbodies and to assess the different scenarios as to how P moves through. Merrin noticed that it was the same pattern over the year, where all the runoff was mostly going through the ground and not over land (SRP soluble reactive P same as dissolved – DRP).

I learned from Merrin that phosphorus loss is dominated in NON-GROWING SEASON and during PEAK Flow conditions both subsurface and surface runoff, these all result in P losses.

She was clear that we need to pay attention during non-growing season and BMP implementation to address those times. We have a lot of BMPS are for growing season conditions, like Cover Crop, grassed Water ways, riparian wetlands, WasCOB, used to minimize P but we need to think beyond that. She also reinforced that manure should not be allowed to be spread on frozen ground – events show huge loss of P after snow melt/rain.

I also learned that with cover crops that winter kill, the amount of P loss is directly related to how much runoff/ponding water fields exposed to and will vary per field depending on contact with water/length of time. The more contact, the more P loss--- low lying will possibly have more P loss if ; optimize species – ones that don't winter kill; Freeze thaw cycling P. Cover crop risk of winter loss, but can be managed, and not affect edge of field.

For land management practices, Merrin stated that control drainage/tile drainage shouldn't be at expense of increased surface runoff.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

Merrin's message was to encourage subsurface banding of P frozen/unfrozen; she stated that banding reduces P loss by 60% through subsurface placement. This is a message that can be included with conversations with landowners and producers.

Recommend that cover crops are ones that don't winter kill, maximize use of cover crops so as to reduce the amount of P loss through spring runoff and ponding. Varying winter conditions, snow cover impact on the loss of P as well. Encourage the stacking of BMP's for most effective uptake of P.

Ontario Soil & Crop Improvement Association AGM, February 5, 2020

Conservation Authority: SCRCA

Maxing Cereal Rye cover crop management for multiple benefits

What have I learned?

Delaying terminating by even 2 weeks, increases rye biomass 3-fold. Spring 2019 revealed this increase. Late termination decreases density of weeds at the necessary weed-free time. Planting green can moderately decrease a soybean stand. To combat this, the producer needs to use a higher seeding rate to ensure a good stand (rate should be greater than 160,000 seeds/acre). Planting green may delay crop development, but does not decrease yield. If a producer is going to try implementing rye as a cover crop, Jake's suggestion is to first start with an early termination to get used to the practice.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

Plot trials like this help to remove the real and perceived risks associated with leaving cover crops alive into the spring. Armed with the knowledge of increased seeding rates and that planting green doesn't mean lower soybean yields, we can encourage producers to try later termination of a rye cover crop to reduce springtime soil erosion.

Research Dos and Don'ts, Ian MacDonald

What have I learned?

Ian asked the producers: who are your people? Who is your team? Who supports you? Surround yourself with people who support you and will help you reach your research goal.

Research Goals: Genetics X Environment X Management

Academics focus on Genetics, on-farm trials can examine environment and management. Neither academia nor producers can do ALL the research.

On-farm research provides hands-on experience, identifies the need for change, decreases risk of wrong decisions – ie. Learn from each other's mistakes, provides a competitive advantage and the opportunity to collaborate with colleagues, which extends the reach of the information.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

I think the more on farm trials there are of soil health building and water quality improving BMPs the better. The more these BMPs are normalized at the local level, the more uptake there will be. I think if CAs work alongside their local soil champion providing data and any expertise we have, together we can promote the benefit of BMPs.

Making Relay Cropping Work, Mark Burnham

What have I learned?

Mark and Peter Johnson tried relay cropping last season with different tools. Mark used expensive "flexi-select" shoes that help push soybean plants away when he harvested his winter wheat. He found that these shoes clipped some plants and decreased yield a bit. Peter simply used a 6" tile pipe, which is cheap, but it reduced his wheat harvest a bit. They also tried planting different row widths and twin row

wheat. They found that wheat yield is not impacted by soybean growth. They ultimately found (in 2019) that it wasn't profitable to relay crop, it would have been better to solely grow wheat.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

I think it's great farmers are trying to improve their soil health while improving yields, through various mechanisms. Without trying, the industry won't know what works and what doesn't. Maybe these trials could happen over a few more years, with some "normal" cropping seasons to establish profitability. I think these trials were meant to determine if a producer could improve soil health and boost yield. The soil health message is already there. These farmers know wheat is good for soil health and water quality, but wheat doesn't pay as much as other crops, so they are looking at means to make wheat more profitable.

Sandhill Cranes & Ag Conflicts, Chris Sharp, Canadian Wildlife Services

What have I learned?

After nearly being wiped out, Sandhill cranes are experiencing a range and population expansion throughout Ontario (mainly northern and central Ontario). Research (and farmer experience) shows that damage is occurring from the cranes on ag land on the fringe of boreal forests before September 1st. CWS found that a hunting season in this part of Ontario is not currently practical, it's better to do on farm mitigation (scare, kill with permit, provide lure crops and remove attractants). Research is currently tracking the birds through their migration and determining if they can mitigate crop damage through various cropping practices.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

This talk focused on a pest localized to one part of the Province. Unless cover crops would serve as a lure crop, I don't see how this fits into water quality or soil health.

Controlled Drainage, Kevin McKague, OMAFRA

What have I learned?

~70% of moisture extraction is from upper half of crop root zone. Therefore the max acceptable water table height is ~30-50 cm below ground level. Lambton, Chatham-Kent, and Essex Counties were best suited for controlled drainage as there needs to be soil suitability and topographic suitability. These factors suggest that less than 2% of the province could have the potential for controlled drainage. It is easier starting a controlled drainage project from scratch than retrofitting existing free drainage system. CD can decrease nitrogen losses more than phosphorus (mainly because less water is physically leaving the field). CD can actually release more P (if high P in soil). Most water leaves the field during the non-growing season, when a producer doesn't want to store water anyways.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

In the limited areas that controlled drainage could work and would be financially feasible, it is a great means to promote soil health and positively impact water quality. It does involve more labour and management than free drainage. Implementing CD from a retaining soil moisture during droughty periods perspective may improve uptake of this BMP.

Sustainability Discussion Panel, Bronwynne Wilton, Paul Hoekstra (Syngenta), Emily MacDonald (Dairy Farmers of Ontario), Rob Wallbridge (Organic Council of Ontario), Jaclyn Horenburg (Beef Farmers of Ontario), and Nick Betts (SAI Platform)

What have I learned?

Syngenta has 28,000 employees in 90 countries, focusing on crop development, pesticides, and lawn and garden fertilizers. The company spends $1.3 billion in Research and Development. They feel there must be a better way to feed the world as 12% of the world's land surface is farmed. Syngenta is working toward making their crops 20% more productive so they can grow crops on less land.

ProAction is proof to Canadians that dairy farmers are acting responsibly. This program evaluates milk quality, food safety, animal care, livestock traceability, biosecurity and environment.

Organic farming has had 3 important iterations starting with the Founders and Visionaries, which led to Private standards, public regulations, and global recognition. Today, organic farming is in it's third iteration with widespread conversion, a focus towards sustainability and inclusion. There is more of an outward focus on working with other producers to be more sustainable (less "ours is better" mentality).

Sustainable Beef is a program that aims to shift consumer focus to how beef are good for the environment and for consumption. Beef producers want to be part of the food conversation, they don't want people feeling guilty eating beef. They have created a 3rd party voluntary audit for food safety, biosecurity and the environment. In Western Canada, McDonalds, CARA foods, Loblaws, & Cargill created a pilot program that pays a premium to beef farmers who show sustainable practices. The goal is to widen the program across Canada.

SAI Platform consists of 115 members in the food industry (eg. McDonalds, PepsiCo, BIG corporations). The reach of these corporations includes employing 25% of the world's population, farming 50% of all habitable land and using 66% of freshwater resources. These companies have a HUGE impact. The goal of this platform is to create the Farm Sustainability Assessment to decrease the complexity of various sustainability programs and actions and to use one common language. For Ontario farmers, much of our legislation already sets farmers above the benchmarks outlined in the assessment, they just need to show that they have. For example, Heineken wants 100% of their farmers to have FSA by 2030.

Is it possible to incorporate those messages into my objects of promoting soil health, water quality and BMPs ? Why or Why Not?

This panel discussion showed that Sustainability is complex! Each industry, each food corporation, each country, etc. has benchmarks for sustainable practices. Each of these assessments cost the farmer money. We need to remember the financial costs associated with these programs as well as the difficulty for farmers to determine which program guidelines they should follow. Inherently, sustainable practices should carry the message of soil health and water quality for us. We can work with farmers to implement the practices that align with our goals, providing information, data and assistance where possible.


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