Ecological Farming in Ontario

efao.ca

January - February 2019 • Volume 40 Number 1

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Ecological Farmers Association of Ontario

The Future of Farmer-Led Research

Resilience. Regeneration. Restoration

The information farmers trust most is what they learn from other farmers. Creating a 'culture of curiosity' is a philosophical phrase borrowed from the Practical Farmers of Iowa (PFI).

Both EFAO's Farmer-Led Research (FLR) and PFI programs stimulate curiosity and even more importantly, make research happen. Ideas sprout, develop into shoots of research and some mature into improved practices within two or three field seasons. The discarded shoots help busy farmers know what to stop doing.

FLR in Ontario is enabling tastier and more visually appealing peppers, earlier peas, more efficient lettuce production, reduced tillage, even on organic farms, and numerous other options for resource optimization and growing profits.

At EFAO's Farmer-Led Research Symposium prior to the 5th annual conference in London, Ont., keynote speakers Jan Libbey and Tim Landgraf of PFI emphasized the importance of an enterprise budget and then dared to ask farmers to share their budgets with others.

Audience eyes, wide with apprehension, softened to possibility when Tim explained that data about your farm can be less revealing if it is offered in ratios. A recipient farmer can learn a lot about where she is situated in the spectrum of economic metrics of real farmers by assessing gross income per acre, full time equivalent (FTE) employees per acre, or net income per FTE. Such information may facilitate decisions about ramping up or pulling back.

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ECOLOGICAL FARMING IN ONTARIO DISPLAY ADVERTISING

Display advertising space is available in six sizes, in many cases with the option of either horizontal or vertical orientation. We offer a 20% discounted rate to member advertisers who commit to, and prepay for, a year of advertising (six issues).

Submissions should be camera ready and high res digital files are much preferred in PDF, EPS, or TIFF format. When saving files please make sure to embed fonts, and save them as outlines. The image you provide should be the correct size, otherwise a set-up fee will be charged. Send electronic files to editor@efao.ca.

Don't have artwork, or need a current ad modified? We can create an ad for you from original photos, logos, etc. Production time is billed at $45 per hour and can be estimated before ad work. Contact editor@efao.ca for details.

STOCK EXCHANGE - CLASSIFIEDS

The Stock Exchange helps connect farmers and community members to sell and source livestock, seed & feed, land, equipment, and opportunities/services. Stock Exchange ads run in each issue of the newsletter and are posted on the EFAO website. Stock exchange postings cost $10 for EFAO members, $20 for non-members and $15 for more than one issue. Deadlines are the same as for other newsletter content. Visit https://efao.ca/stock-exchange/ or email editor@efao.ca to place an ad.

Disclaimer: EFAO is not able to verify details or claims made in Stock Exchange postings (e.g. regarding certified seed or registered stock). We encourage you to check these details yourself before buying!

ABOUT THE ECOLOGICAL FARMERS OF ONTARIO

Established in 1979, the EFAO was formed by a small group of farmers around their shared commitment to sound farming practices like cover cropping, crop rotation, planting green manures, composting, soil conservation, timely and appropriate tillage, good livestock management, promoting biodiversity, and avoiding the use of synthetic fertilizers and pesticides. Our work remains rooted in the practical application of these same sustainable farming methods, which in turn remain at the centre of ecological or organic farming, and are the foundation of certified organic production standards today.

For more than 30 years, EFAO has provided essential mentorship and training for both new and established farmers. By promoting farmer-to-farmer knowledge sharing, learning opportunities, and creating supportive community around good food and farming, we strive to maintain and enhance the health of the soil, crops, livestock, the diversity of the environment, and our rural and urban communities.

EFAO is a registered charity with the Canada Revenue Agency. Tax receipts will be issued for donations of $25 or more. Charitable registration # 88074-6532-RR001

For new memberships and renewals, to receive our events bulletins and e-news, to register for events, post a stock exchange or display ad, use the advisory service, or just get in touch with us about anything, visit **www.efao.ca**, or contact:

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Tell us what you're doing, farming or otherwise. Write a letter to the Editor. Help make Ecological Farming in Ontario a farmer's journal! Submit articles, photos, opinions and news to editor@efao.ca.

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Ecological Farming in Ontario

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CONTRIBUTORS

Ralph C. Martin (cover) grew up on a beef and hog farm in Wallenstein, Ont. In 2001, he founded the Organic Agriculture Centre of Canada to coordinate university research and education pertaining to organic systems across Canada. From 2011 to 16, he was the Loblaw Chair in Sustainable Food Production at University of Guelph, where he is a professor.

Éric Blondin (pg. 5) operates Three Forks Farms in Warren, Ont., between Sudbury and North Bay, with his partner Peggy-Gene Baillie. They service direct and wholesale markets in Sudbury and North Bay with mixed vegetables and pastured chicken through the Artisanal Chicken Program. Éric and Peggy are now certified organic with Eco-cert.

Tony McQuail (pg. 15) bought his farm near Lucknow, Ont., in 1973. He and his wife Fran have run a diversified organic farm raising livestock, a small apple orchard and a community supported garden. Tony was an early adopter of rotational grazing and has decades of experience in pasture management and fencing systems. The McQuails have transferred the farm operation to their daughter Katrina and continue to be actively involved in it.

Sarah Hargreaves (pg. 17) has degrees in ecology from U of T (B.Sc, M.Sc.) and a Ph.D. in soil microbial ecology from Iowa State University. She and her husband Drake founded and run Three Ridges Ecological Farm near Aylmer, Ont. She is also EFAO's Director of Research.

Editor's Message

by Fiona Campbell

In 1979 Pierre Trudeau was defeated by Joe Clark as Prime Minister, PC Bill Davis was Ontario's Premier, and the number one song in Canada was "The Logical Song" by Supertramp.

1979 was the year of the second oil crisis, where the price of crude doubled to US$39.50 per barrel, the prime interest rate was 12.90% (to jump to 19.29% in just two years), minimum wage was $3.00 and the average per person income was almost $23,000.

In 1979 the Sudbury Strike, where 11,600 Inco workers picketed for nine months, finally ends (making it Canada's then longest work stoppage), the Royal Canadian Mint releases its first gold bullion coin, and Margaret Atwood publishes *Life Before Man*.

1979 was also the year a group of farmers came together to form the then Natural Farmers Association of Ontario. The goal of the NFA (later renamed EFAO in 1984), was to share knowledge and practices of organic farming, to build community and increase resiliency in the face of inflation, development and environmental degradation.

While the landscape in Ontario may have changed in 40 years, today's EFAO membership share the same commitment to farming practices that nurture the soil, conserve energy, and build local food security, while promoting farmer-to-farmer skill sharing.

EFAO is as relevant now as it was in 1979. We are approaching a tipping point where ecological farming can no longer be dismissed as radical or alternative. With urgency comes opportunity.

Over the next year, we'll be featuring articles from the past, and thoughts about the future. But for now, enjoy our supersized issue featuring reports from our Farmer-Led Researchers whose work today can help make informed decisions for the next 40 years.

Cheers,

Fiona

editor@efao.ca

Follow Us!

@EFAO2

EFAO staff at the 2018 conference: L-R Martina Schaefer, Heather Coffey, Allison Muckle, Thorsten Arnold, Naomi Krucker, Sarah Hargreaves, Katie Baikie & Ali English.

Farewell to Board Members: Angie Koch & Karen Maitland

Both have completed the full six years on the EFAO Board. Angie has been President of the Board for the past four years and Karen has been Treasurer for the last three. As an incoming Executive Director, there really isn't anything you could wish for more than to have both a President and Treasurer that are supportive, skilled and engaged.

Before joining the Board, Karen spent eight years as EFAO's main staff in the role of Member Services Coordinator. She has many years of experience with the organization, hundreds of strong relationships with members, and left some big shoes to fill for staff. For all my years with EFAO, Karen has dropped by the office every couple weeks to sign cheques, but more significantly, to help staff puzzle through big questions, share insights and provide general confidence inspiring support.

Angie has played an important role in leading the Board, but also in helping EFAO instigate and shape our annual conference and the Farmer-led Research Program. Angie has a few incredible super powers that have been invaluable in many Board discussions over the last six years – insightful and creative feedback to almost any question she is asked and a skill for finding common ground and seeing a clear way forward.

Karen and Angie – you are going to be missed on the Board. But you have set us up for success and for many good things to come. Thank you so much for all you have given EFAO to make us a stronger and more resilient organization, that can in turn support farmers to do the critical work that is ecological farming.

Ali English
EFAO Executive Director

Board Perspective

by Éric Blondin

The arrival of January brings to us a new year. It is the time when we look back over the past year and take stock of everything that has happened. It's also the time to look ahead, plan, and hope the weather will be on our side.

Every year, at the end of November, I find myself tired and lacking inspiration. The last thing I feel like doing is putting together a plan to tackle the next season. However, those feelings seem to disappear by the end of the annual EFAO conference. The conference re-ignites my passion.

This year, for the first time, I participated in the Farmer Led-Research Symposium at the conference. All the research being done by members was inspiring and useful. The research data not only benefited the farmers conducting the experiment, but is also applicable to so many other growers. If you have a research idea, I strongly encourage you to contact Sarah Hargreaves at the office.

This year also saw the addition of full-day intensive workshops, which allowed presenters to really dig into the "weeds" of a topic. It also allowed the space for many questions, and for participants to add to the conversation during break times. This speaks to the other valuable part of the conference -- the opportunity for discussions between members. Those conversations are so important in furthering the ecological and organic sector in Ontario.

The conference has been going on for five years, and every year it is fresh and relevant. During the drive home from the conference, I found myself again inspired and thinking about all the projects, experiments and new techniques that I want to implement on the farm for the following year.

Looking ahead to 2019, it's our 40th anniversary. It's a huge milestone in a province that has seen many agricultural organizations come and go. Part of looking ahead will be to look back. We're opening the archives. We'll be curating some articles from the past 40 years to include in the newsletter. We'll be doing some Q&As with founding members.

An anniversary is a great opportunity to look back, but also to look forward and plan for the future. This year we plan to hold 40 events for our 40th anniversary. To reach our goal we will need you, the membership, to think about what KTMs or field days that you could host, or events you would like to see happen. Please contact our amazing team in the office with your ideas.

Good luck to everyone in your planning for 2019. I wish you the right amount of rainfall and sunny harvest days.

Photo credit: Mike Smith

WHAT ARE YOU CURIOUS ABOUT?

APPLY NOW FOR FARMER-LED RESEARCH!

Online: efao.ca/research-submission
Deadline: January 31, 2019

Highlights from the 2018 Annual Report

Membership
Active membership across the province is very similar to where it was last year at 485 members, which includes 33 Associate Members, 8 Sustaining Members and 15 Business Members. Regional distribution is as follows: West (55%), Central (22%), East (19%), North (3%), Other (1%)

EFAO's New Vision & Mission
Vision: We envision an Ontario where thriving ecological farms are the foundation of our food system, and where agriculture protects our resources, increases biodiversity, mitigates climate change, and fosters healthy, vibrant communities.
Mission: EFAO supports farmers to build resilient ecological farms and grow a strong knowledge-sharing community.

Program Highlights
804 people attended 34 events

- 16 field days: 7 highlighting farmer-led research trials and 5 in partnership with the Bauta Family Initiative on Canadian Seed Security
- Conference in Blue Mountains brought together 318 participants
- 5 workshops, 4 webinars, 1 Free School
- 14 advisory service arrangements
- 1st Fundraising Dinner at The New Farm
- The Online Forum has engaged 320 individuals in 216 farming discussions, for a total of 1,400 posts!

Farmer-Led Research
This year, 20 members received funding and technical support to conduct their own research. These farmer-researchers conducted 14 new trials focused on soil health, weed control, disease and pest control, seed production and breeding, and pasture regeneration. You will find a listing of this year's research trials on pages 18-20 of this newsletter, as well as copies of four research reports in the centre insert. All research reports will be posted at efao.ca/research-library.

Special AGM Features

- EFAO's new logo was unveiled, see below!
- EFAO's video *Cultivating Curiosity in Ontario with Farmer-led Research* was launched and can be viewed at efao.ca/farmer-led-research

To download the full annual report, please visit efao.ca/reports

EFAO
ECOLOGICAL FARMERS
ASSOCIATION OF ONTARIO

We are very excited to launch EFAO's new logo!

This new logo:

- places the EFAO acronym at its centre;
- emphasizes soil health, which is at the core of ecological agriculture;
- with the plant growing out of the "O" represents EFAO as a fertile and nurturing organization where new ideas, innovations and connections can take root and flourish.

Working with Toronto-based Design for Good (designforgood.ca), we will be undertaking a general communications redesign over the coming year (our 40th Anniversary!) that will integrate the new logo. This will include redesigning our website, E-news and print newsletter. As we transition, you will see both logos used and, as always, you can find up-to-date information on EFAO programming and services on the website: efao.ca

So keep an eye out for these updates that will enable EFAO to more effectively communicate the work we do in supporting farmers to build resilient ecological farms. If you have any questions or comments, please contact the office at martina@efao.ca or 519-822-8606.

EFAO Financial Statements

Summary Statement of Financial Position for the year ended August 31, 2018.

	2018	*2017*
ASSETS		
Current		
Cash	168,403	141,845
Accounts receivable	27,844	9,422
Prepaid expenses	1,984	9,547
	$198,231	**$160,814**
LIABILITIES AND NET ASSETS		
Current		
Accounts payable and accrued liabilities	11,647	9,689
Deferred income	131,725	100,336
	$**143,372**	**$110,025**
Net Assets		
General fund	54,859	50,789
	$198,231	**$160,814**

Statement of Revenues and Expenditures for the year ended August 31, 2018

REVENUE		
Grants	222,018	230,696
Conference registrations	42,996	30,565
Goods and Services	24,556	24,930
Gifts	6,997	4,243
Membership and other	32,966	37,757
Sponsorship	6,087	7,499
Rental	-	1,200
Partners	-	1,022
Scholarship	-	1,000
	$335,620	**$338,912**
EXPENSES		
Contract services	19,037	19,011
Programs and services	82,809	70,227
Personnel	176,642	152,577
Administration	24,189	21,837
Operating	13,591	10,445
Travel & hospitality	7,060	10,894
Special Fund disbursements	2,117	19,161
Communications & promotion	6,105	10,638
	$331,550	**$314,790**
Excess (deficiency) of revenue over expenses	**$4,070**	**$24,122**

Note: This is part of the full financial statements audited by Curtis-Villar LLP, Guelph, Ont. A copy of those can be available upon request.

Conference Thank You!

Thank you to everyone who made the 5th Annual Ecological Farmers of Ontario Conference a success! **Regeneration: Seeds, Soil and Community Connection** saw the most participants of any conference yet, with more than 400 people joining us over the course of four days, from December 3rd to 6th in London, Ont.

We'd like to first thank everyone who attended the conference this year. Your enthusiasm, support and positivity is inspiring. We hope the conference provided some new ideas, new connections and new motivation for a great 2019 season.

Thank you to the Eastern Canadian Organic Seed Growers Network for hosting your gathering alongside this conference. It was great to have this community of farmers not only join us at the conference but inspire so much of the incredible seed-related programming this year.

Thank you to the supporting partners: the Bauta Family Initiative on Canadian Seed Security, the Organic Council of Ontario, the National Farmers Union Ontario, the Ontario Soil Network and the Local Food and Farming Co-ops network. It is one of our great privileges at EFAO to work alongside other organizations doing such good work.

Thank you to the conference sponsors (featured on the back of this issue) for their generous support and belief in this event. This event truly would not be possible without their contributions. And thank you to the Trade Show exhibitors who came out to showcase their products and services while supporting this community of farmers.

A very special thank you to the conference keynote speakers for your inspiring and motivating messages: Jan Libbey and Tim Landgraf, Val Steinmann, Rowen White and Carmen Black. To all the speakers who joined us from across Ontario, Quebec, British Columbia and the United States, thank you for sharing your stories and expertise. And thank you to the farm tour hosts for bravely hosting during snow squall warnings!

Thank you to all the hard-working volunteers who helped behind-the-scenes to ensure the smooth-running of the conference. You can thank conference photographer Mike Smith for all the incredible photos you'll see throughout the year! And thank you to graphic artist Caitlin Taguibao for the artistic representation of the theme on our conference program cover and promotional materials.

Thank you to all New Farmer Bursary Fund donors: Johnny's Select Seeds, Neudorff North America, Schefter Poultry Processing, TSC, London Community Foundation, CRAFT Southwestern Ontario, NFU Local's 333, 347 and 328, and Fertile Ground Farm. We were able to give out 15 bursaries this year - our most ever!

Thank you to all involved with the Silent Auction - those who donated and those who bid on items. We raised $2,400 to support EFAO's educational programs and services.

Please don't hesitate to be in touch at conference@efao.ca with any ideas or feedback for next year's conference or if you'd like to be a part of shaping the 2019 program. We'll be announcing date and location details in the coming weeks.

Thank you to everyone for another great year!

Photo credit: Mike Smith

Winners of the 2018 Daisy Awards

How EFAO members recognized -- and thanked -- their fellow farmers

The annual Daisy Awards were held on December 5th at the Conference Banquet Dinner. Inspired by the Arthur Awards, presented by the late Stuart McLean on the Vinyl Cafe, they are intended to recognize moments that are "somewhat dog-like in nature: affectionate, unassuming, and small in the grand scheme of things... but memorable nonetheless." As Stuart McLean says, these are the awards that celebrate the little things that, too often, go unnoticed.

Nominee: Tony & Fran McQuail
Extreme Mentorship Award

Tony and Fran continue to mentor and support many young farmers. They continue to work super hard at Meeting Place Organic Farm despite having "retired." This year when they go on vacation, they visited other farms and end up helping out.

Nominee: Jill Bishop
Germinator Award

Jill Bishop of Urban Tomato has been an incredible mentor to me and to many other novice seed producers across Ontario. Jill taught me to save seeds back in 2008, starting with the easy tomato seed but since then has been mentoring me as my journey to become a seed saver has evolved. Without her ongoing support, I would not be where I am now with our seed operation, or have done Farmer-Led Research about seed production. *By Peggy Baillie*

Nominee: Ken Laing
Master of Soil Award

Ken has helped out both our farms, and so many others across Ontario, to understand and interpret our soil tests. We've heard Ken give many a workshop on the importance of healthy soil. We've both used the EFAO advisory service, connecting us with Ken, to get help interpreting our soil test, improving our farms for the better.

By the farmers at Field Good Farms & Three Forks Farms

Nominee: Gerald Poechman
Local Sage Award

If you asked Gerry for his bio he would probably say he does custom organic milling, runs a mixed organic farm, is part of the Organic Meadow co-op, and has quota for organic eggs. But that is just what he does. What he *is* is a deep reservoir of local knowledge on small scale beef, broiler, egg, field crops, pork production and soil health. I learn more every time I chat with Gerry while bagging feed than I have from most seminars and consultants. And sometimes we just talk about the weather (which leads to water infiltration which leads to soil fertility, which leads to grazing management which leads to…) *By Rob Campbell*

Nominee: Jennifer Seilern
Board Member Extreme Award

Jen manages to serve on the board for numerous organizations, co-parent 2 kiddos and farm full time. So many organizations benefit from her selfless contributions by making her own life bananas!

Nominees: Talia and Simon Fletcher
Community House Building Award

They keep providing people with the opportunity to learn about and participate in learning about timber framing, strawbale building and plastering.

Nominee: Aden Spurr
Hay Maker Extraordinaire Award

Every year Aden comes down to help our farm with our small square baling, and manages to get his own hay off as well! So much gratitude.

Nominee: Tamara McMullen
Best Salad Maker Award

Tamara (and Brian) grow incredible greens and vegetables, which means that whenever they come to a potluck they bring the best salads, full of amazing veggies, beautifully arranged with fabulous dressings!

Nominee: Brian Wiley
Sourdough Bread Maker Award

Brian makes such delicious sourdough, sharing both his starter and the bread and bagels that he makes generously with those around him.

Nominee: Chantal Lewington
The Hammer Award

This year four farms came together to market collectively through an online store called Click Fork. Chantal Lewington of Dalew Farm, hammered her way through a lot of the details. She kept on software developers, for months to ensure the website was going to be ready. The launch was far from smooth, but again Chantal worked and most definitely pushed and hammered to get things done.

Nominee: Rob Campbell
The Big Picture Observer Award

Rob recommended the book "Doughnut Economics" by Kate Raworth and it is the best new visioning of what economics could and should be about and how to envision a different framework for evaluating economic choices.

Nominee: Katrina McQuail
Social Media Maven Award

Katrina has used social media to promote Meeting Place Organic Farm, inform her customers and catapult "Pickle the Pig" to twitter stardom and stage fame. *By Tony McQuail*

Nominee: Hannah Hunter

Hannah has had a kind heart and a cool head in the face of aquaponic disasters, mid-season burnouts, broken tractors and stolen tomatoes. She is a community builder and organizer and a good friend to fellow farmers and farm cats alike. After five seasons she will be sorely sorely missed but we know her new farm cooperative will be an amazing success. *By Fresh City Farms Team*

Carrot Cache $1,000 Innovation Prize Winner

Off-grid seedling house: Eva Mae Farm, Brighton, Ont.

Tank lid off (above) and in use

I built a solar-powered heat exchanger and reservoir to buffer temperatures and to create a heated bench in my otherwise unheated seedling greenhouse.

While it is common practice in unheated greenhouses to use water barrels as a heat storage mechanism, the barrels often heat up too slowly to have useful heat early in the season, and release heat too slowly to protect against sudden cold snaps.

My innovation is to pump the water through a homemade heat exchanger when the air temperature in the greenhouse and the water temperature in the reservoir are signficantly different. This approach both pumps heat into the tank when the greenhouse gets warm in the day (when the air is hot and the tank is relatively cool) and pumps into the air when the temperature drops at night (when the air is cool and the tank is relatively warm).

In addition, the water is stored in a homemade insulated tank/seedling bench. The tank is insulated on all sides with rigid foam except for the top, which is a plywood lid. Seedlings requiring mild bottom heat are placed on top of the tank.

Finally, when severe weather threatens, a piece of Agribon or other row cover can be spread over the top of the tank, providing extra protection for frost-sensitive seedlings. I am able to put tomato and pepper seedlings on the bench by early March (when I often experience outdoor temperatures as low as -10° C) with no problems.

The system is controlled by an Arduino (an inexpensive single board computer, using a program I wrote), which reads temperatures from two waterproof temperature probes, and controls the circulation pump (a 12 volt fountain pump) and heat exchanger fan (a large computer case fan) with relays. The heat exchanger is constructed from copper pipe wrapped in aluminum soffit material to increase surface area. The heat exchanger is strapped to the ridge purlin of the greenhouse and is sloped slightly towards one side so that it automatically drains when not running (to avoid freezing). The water tank is a plywood box with 2x3 bracing on the outside and 1" rigid foam on the inside, covered with scrap polyethylene plastic (leftovers from covering the greenhouse).

Everything is powered from a 100 watt solar system (panel, charge controller and deep cycle battery) that is also used to run an inflation fan for the double layers of plastic on the greenhouse.

Overall the cost to construct the heat storage system was about $340. The solar system cost about $475 but was also needed to run the inflator fan. All in all, it was considerably cheaper than a furnace and requires no fuel of any kind.

Heat system cost breakdown

Arduino + sensors:	$ 60
Lumber for tank:	$120
Insulation for tank:	$ 75
Water pump:	$ 20
Heat exchanger fan:	$ 12
Copper pipe:	$ 36
Aluminum soffit:	$ 17
Total	**$340**

Solar cost breakdown

100W panel + controller:	$250
Deep cycle battery:	$225
Total	**$475**
Grand total:	**$815**

Photo source: Eric Barnhorst

EFAO 2018: Minimum tillage with tarps

Does tarping between succession plantings reduce the amount of tillage and labour required for organic salad production?

SOIL HEALTH

WEED CONTROL

Farmer-Researchers

Brent Preston
Gillian Flies
The New Farm - West

Project Timeline:
July 2018 - September 2018

In A Nutshell

With the goal of regenerative farming, Brent and Gillian want to minimize tillage for their organic salad greens production.

To do this, they trialed tarps to kill residue between succession plantings and recorded the management needed to direct seed. They also tracked labour, including time moving and placing tarps and hand weeding.

Key Findings

- Tarping soil, without tilling before tarping, reduced tillage by 82% and resulted in faster growing crops.
- It also reduced total labour 60% for lettuce and spinach crops because of fewer weeds.
- It increased total labour by 65% for mustard greens, which do not require weeding.

METHODS

Design

Brent and Gillian compared three methods of bed preparation for succession plantings of lettuce, spinach and mustard greens:

1. **Tarp without tilling first, then till or tine weed if necessary before direct seeding (minimum tillage, MT)**
2. **Till then tarp, then till or tine weed if necessary before direct seeding (till, tarp; TT)**
3. **Till and leave uncovered, and till before direct seeding (control)**

Control beds were beside the tarped beds and they planted the **same crop at the same time in all beds**.

Measurements

For each tarp placement and control, Brent and Gillian recorded management needed for bed preparation (tillage, tine weeding, nothing), weeks to harvest and approximate labour hours. At one time point, they also took measurements of soil respiration - a proxy for soil microbial activty - from tarped and tilled soil using a Solvita® Field Kit.

Table 1

Tillage scores for bed preparation in Brent and Gillian's tarp trial

Treatment	Tillage Score
No-till after harvest, tarp, till if needed (minimum tillage; MT)	0 no-till before tarp + 0.2 for tine weeding + 1 for tillage **Min 0, Max 1**
Till after harvest, tarp, till if needed (till, tarp; TT)	1 till before tarp + 0.2 for tine weeding + 1 for tillage **Min 1, Max 2**
Till after harvest, till before planting (control)	2 till before bare **Min 2, Max 2**

Tine weeding, rated here at 20% the impact of tillage, is shallow but thorough for prepping a seed bed.

RESULTS

Tillage

- Tarping beds with no tilling before and with minimum tillage after (MT) **reduced tillage by 82%**, with high statistical confidence (P<0.01; **Figure 1**).

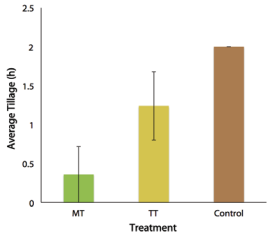

Figure 1. Average tillage for salad greens production for the two tarp treatments and control.

- Compared to tilling and tilling before tarping, all greens grew faster when soil was managed with tarps and minimum tillage (**Table 2**).
- Tilling before tarping (TT) also reduced tillage by 39%, but crops did not grow faster than control.

Table 2

Crop growth comparison for tilling before tarping (TT), no-till before tarping with minimum tillage before direct seeding (MT) and tilled control.

	Treatment	Lettuce	Spinach	Greens
Weeks to harvest	MT	4	3	2.5
	TT	5	4	3
	Control	5	4	3

Labour

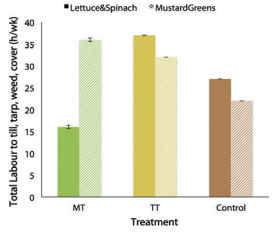

Figure 2. Total labour to grow lettuce, spinace and mustard using the two tarp treatments and control.

- For lettuce and spinach, **labour was 60% less** with minimum tillage (MT) compared to the tilled control (P<0.001; **Figure 2**).
- For mustard greens, which do not require weeding, moving tarps increased total labour by up to 65% (P<0.001).

Soil Respiration

Tarped soil: 212 +/- 77 (4 replicates)
Tilled soil: 186 +/- 71 (4 replicates)

- There was no detectable difference in soil respiration because there is a 16% (P=0.16) chance that the higher average soil respiration from tarped soil was due to chance and not to the tarp.

Top left: Soil that was tilled before tarping; **Right**: lettuce planted after tarping (left) and after tilling (right) shows the different growth rate. **Bottom left**: Lettuce stubble after two weeks under a tarp; **Right**: Spinach stubble after two weeks of tarping.

TAKE HOME MESSAGE

Tarping between succession plantings of salad greens - without tilling before tarping - is an effective way to **reduce tillage and labour and increase plant growth rate**. The reduction in labour is a result of less weeding, which Brent and Gillian posit is because weeds were solarized under the tarp. They posit that faster growing crops are a result of better soil structure from less tilling and optimal soil moisture for germination in beds that were tarped.

An impact on the soil microbial community was not evident from the data collected in this study. Further, the long-term impact of tarping is also unknown, as is a comparison of the embodied carbon in the plastic tarps vs. carbon lost via tilling.

Because of this research trial, Brent and Gillian are switching to a minimum tillage system with tarps.

Thank you to the **Trillium Mutual Roots Community Fund** for the Solvita® Field Kit.

Ecological Farmers Association of Ontario

HORTICULTURE RESEARCH REPORT

Printed November 2018

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THANKS TO OUR PROJECT FUNDERS

Ontario Trillium Foundation
Fondation Trillium de l'Ontario
Robert and Moira Sansom Ideas Foundation, a fund within the London Community Foundation
Weston Seeding Stronger Communities

Does ultra high density grazing as part of adaptive multi-paddock grazing have merit in Ontario?

PASTURE REGENERATION

Farmer-Researcher

Tony McQuail

Meeting Place Organic Farm - West

Project Timeline:

June 2018 - October 2019

In A Nutshell

Adaptive multi-paddock (AMP) grazing uses short grazing intervals followed by long rest periods. By doing so, this system allows for plant recovery, promotes optimal plant communities, protects against erosion and leads to net carbon storage in the soil (Stanley et al 2018).

To optimize his grazing, Tony assessed the benefits of ultra high density grazing as part of his AMP approach. Specifically, he tested whether a single pass of mob grazing would provide a "hit and boost" to his pastures.

Key Findings

- The amount of forage consumed was the same, irrespective of standard or ultra high density grazing.
- Tony found no difference in pasture recovery between standard and ultra high density grazing.
- Tony will graze these areas in a similar way next year to see if a second year of a "hit and boost" has benefits.

METHODS

Specific Questions

Does stocking density affect the amount of forage consumed?

Does pasture recovery differ between standard and high density grazing?

Design

To test high density grazing as part of his AMP approach, Tony would move cattle through a 3-day sequence:

- **Standard stock density**, 1 paddock/day (control 1)
- **Ultra high density**, 6 paddocks/day (treatment)
- **Standard stock density**, 1 paddock/day (control 2)

He repeated this 3-day sequence over 5 areas in the pasture. Tony's **ultra high density paddocks had over 100,000 lb bodyweight per acre**, and he achieved these densities with many smaller paddocks throughout a single day. The same set of 15 paddocks got a second pass, all with standard stocking densities (**Table 1**).

Table 1

Range and mean stocking density and paddock size for the two control and ultra high density paddocks

Treatment	Stocking density (lb bodyweight per acre)	Paddock size (acres)
Ultra High Density	317,147 - 634,295 Mean: 389,888	0.059 - 0.118 Mean: 0.087
Control 1	8743 (for a heifer group) - 79,287 Mean: 42,211	0.376 - 1.438 Mean: 0.792
Control 2	45,078 - 77,121 Mean: 57,377	0.169 - 0.725 Mean: 0.489

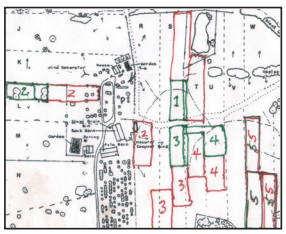

Figure 1. Areas used for the 5 moves. Each move included an ultra high density area that was divided into smaller paddocks (green) and two standard density paddocks (controls, red)

Measurements

Using a FarmWorks F400 rising plate meter (photo), Tony estimated the amount of standing biomass before and after the cattle entered a paddock, and estimated forage consumed by subtracting them. For ultra high density grazing, he took a representative sample across all 6 paddocks that combined for a daily move.

A FarmWorks F400 rising plate meter that Tony used to estimate pasture height and density. For each measurement, Tony took 34-36 estimates of standing biomass across a pasture.

RESULTS

Rising Plate Meter

- The rising plate meter consistently underestimated the amount of daily forage consumed when compared to estimates based on animal units consuming 30 lb dry matter (**Figure 2**).
- This is likely due to lack of calibration with the specific pastures. Nevertheless, we can use Tony's numbers to estimate relative change in biomass.

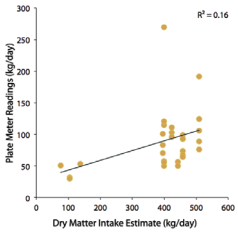

Figure 2. Correlation between the rising plate meter reading and daily forage estimates from animal units x 30 lb dry matter.

Forage consumed

Total forage per paddock before - total forage per paddock after

- There was a lot of variation in forage consumed from paddock to paddock but these differences can not be attributed to stocking density (P=0.42; **Figure 3**).

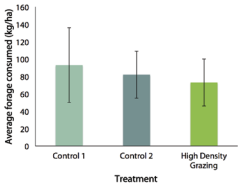

Figure 3. Forage consumed in the two control sections and the ultra high density sections. Means (bars) +/- 1 standard deviation (lines) are shown (n=5 replicates).

Recovery

Standing biomass before second pass (i.e. recovery) - standing biomass after grazing first pass

- Recovery did not differ between the control and ultra high density grazing (P=0.49; **Figure 4**).
- Tony suspects very dry conditions (**Figure 5**) in the beginning and middle of the growing season stunted any potential response.

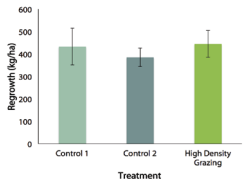

Figure 4. Pasture recovery in the two control sections and the ultra high density sections. Means (bars) +/- 1 standard deviation (lines) are shown (n=5 replicates).

Rain fall

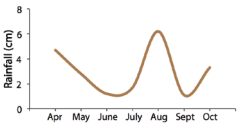

Figure 5. Monthly total rainfall at Meeting Place Organic Farm in 2018. Historical monthly averages exceed 7 cm for these months.

TAKE HOME MESSAGE

Tony's finding that his cattle consumed the same amount of forage, irrespective of standard or ultra high density grazing, provides evidence that ultra high density grazing provides enough biomass for the animals. This is contrary to thoughts from those that oppose ultra high density grazing.

While Tony found no difference in recovery, the dry season may have contributed to this. He will continue to graze in this pattern next year and record forage biomass.

Ecological Farmers Association of Ontario

LIVESTOCK RESEARCH REPORT

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Weston Seeding Stronger Communities

EFAO 2018: Green mulches for garlic production

Does planting timing of green mulches affect yield of garlic and labour?

COVER CROPS

WEED CONTROL

Farmer-Researcher

Eric Barnhorst

Eva Mae Farm- East

Project Timeline:

July 2017 - September 2018

In A Nutshell

This project compared yield and labour for garlic planted into established oats, garlic and oats planted together, and garlic without a cover crop.

Key Findings

- Garlic survival and proportion of medium garlic was highest when garlic was planted with oats or into bare soil (control); and lowest when garlic was planted into an established oat cover crop.
- Garlic planted into an established cover crop required more planting labour and delayed emergence. Delayed emergence, in turn, delayed weeding and allowed perennial species to establish.
- Eric won't use the oat treatments as tested again; but seeing the biomass of the early oat planting has motivated him to tweak the system to make it work.

METHODS

Design

Eric randomly assigned 6 beds to one of three treatments:

1. **Garlic planted in November into early oats (early oats)**
2. **Garlic planted at the same time as an oat cover crop in November (late oats)**
3. **Garlic planted in November into bare soil with no cover crop (control)**

He made three sections per bed and randomly assigned 6 varieties of garlic to each section (**Figure 1**). The garlic he used was: Tibetan (T), Persian (P), Chesnok Red (CR), Northern Quebec (NQ), Korean Purple (KP), French Rocambole (FR).

Figure 1. Layout of Eric's trial with 6 beds, 3 rows of garlic and 3 sections per bed, each with a randomly assigned variety. This is a semi-randomized design and each variety is a replicate. Treatments: **Early oats**, **late oats**, and **no cover crop control**.

Bed 1	Bed 2	Bed 3	Bed 4	Bed 5	Bed 6
NQ	CR	FR	P	P	T
KP	FR	NQ	NQ	T	P
CR	T	KP	KP	FR	CR

Management

On September 12, 2017, Eric precision seeded the oats in the early oats treatment beds at about 120 lbs per acre using an Earthway seeder (www.sare.org, Using Manually Operated Seeders for Precision Cover Crop Plantings on the Small Farm).

On November 14, 2017, Eric seeded the late oats treatment beds using the same specifications. He randomly assigned 3 varieties to each bed and planted the garlic using a homemade multi-row dibbler.

In spring, Eric measured survival by counting the number of sprouted plants. He controlled weeds twice by rototilling the pathways and hoeing, then hand weeding, the beds.

On July 31, 2018, Eric harvested the garlic. For each section, he counted garlic heads by size class using a peg board with ¼" increments with medium size garlic ranging between1.5-1.75".

RESULTS

Seed Quantity: Yield

- Garlic that was planted at the same time as oats (late oats) and planted without a cover crop (bare) had similar survival of around 50%. Garlic planted into an established cover crop (early oats) had lower survival of 26% (**Figure 2**).

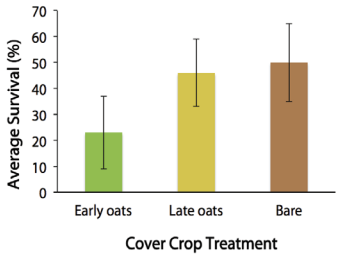

Figure 2. Percent survival of garlic planted for each treatment. Bars are means +/- standard deviation.

Seed Quality: Size Class

- Total large+XL and medium-sized garlic was greatest when planted with late oats and with no cover crop (bare).
- Garlic planted after early oats had 35% less medium and 22% less large+XL garlic (**Figure 3**).

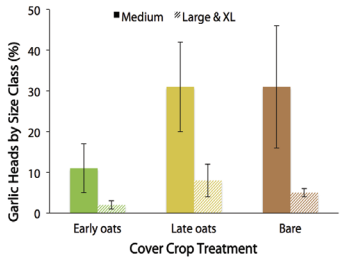

Figure 3. Garlic heads by size class for the three treatments. Bars are means +/- standard deviation.

Table 1

Management differences among the two oat cover crop treatments and bare soil control.

Trt	Oat establishment	Garlic planting	Spring soil	Weeds present
Early oats	Great, but planting garlic crimped and killed oats early (photo below)	2x as long to find holes; more force needed	Residue delayed emergence and first weeding	Perennial grasses
Late oats	Didn't grow enough to establish cover	Easy	Bare	Pigweed, lambsqrts
Bare	N/A	Easy	Bare	Pigweed, lambsqrts

TAKE HOME MESSAGE

Using oats as a winterkill mulch for garlic is a compelling idea to keep living roots in the ground in the fall and reduce weed pressure the next growing season.

For garlic planted with oats, yield and quality were similar to the bare soil control. The oats grew a small amount of biomass in the fall but decomposed in the spring.

Seeding oats early and planting garlic into an established oat cover crop resulted in lower garlic yield and lower quality. While early oats produced a nice mulch, management was harder since planting through the oats took twice as long and perennial grasses established, making weed control more difficult.

NEXT STEPS

Eric will not use the specific methods he tested again but is keen to try planting garlic at the same time as an early oat cover crop.

He was excited by the oat establishment, but will consider planting oats in 4 widely spaced rows that will allow for easier planting and mechanical weed control.

Before he tries this, however, he wants to figure out ways of removing the cover crop residue in the spring so that garlic emergence is not delayed.

Ecological Farmers Association of Ontario

HORTICULTURE RESEARCH REPORT

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Robert and Moira Sansom Ideas Foundation, a fund within the London Community Foundation

Weston Seeding Stronger Communities

EFAO 2018: Lettuce seed production in northern Ontario

Is lettuce seed production in northern Ontario improved using a hoop house?

SEED PRODUCTION & BREEDING

Farmer-Researcher

Peggy Baillie

Three Forks Farm - North

Project Timeline:

May 2018 - September 2018

In A Nutshell

Northern Ontario faces specific challenges compared to other parts of the province when it comes to seed production, including late springs and early frosts (as early as end of August), followed with a wet fall.

The demand for lettuce and greens seed is high, but these growing conditions make producing lettuce seed outdoors very difficult. This means that northern seed producers cannot produce regionally adapted varieties.

As a potential solution to lettuce seed production in northern Ontario, Peggy compared seed production in a hoop house and uncovered.

Key Findings

- In the hoop house, Peggy grew sellable lettuce seed from 4 of 5 varieties, and sales of the seeds would recoup hoop house material costs in 2.21 years.
- When grown uncovered, none of the 5 varieties produced viable seed.

METHODS

Design

Peggy grew 5 varieties of lettuce both in a **hoop house** and **uncovered** and compared seed yield by weight.

She randomized the position of each variety in the hoop house and uncovered in a paired design with 4 replicates. This design allowed her to test for differences in seed production between the hoop house and uncovered. With only one replicate of each variety under the hoop house and uncovered, the design did not allow us to test differences among varieties.

Figure 1. Peggy's experimental design for lettuce planted for seed production. The bed was 70' and continuous, with 48' of the length under the hoop house and the remaing uncovered.

Hoop House				
Dark Lolla Rosa	Cosmos	Jericho	Straw-flower	Black Seeded Simpson
Peppers				
Celosia	Red Oak Leaf	Snap dragons	Lovelock	Stock
Uncovered				
Jericho	Cosmos	Black Seeded Simpson	Straw-flower	Red Oak Leaf
Peppers				
Celosia	Dark Lolla Rosa	Snap dragons	Lovelock	Stock

Measurements

Along with production notes like bolting and seed set, Peggy weighed all seed harvested from each variety. She harvested seed over a three week period, collecting viable seed by thresing seed heads into a large paper bag, then leaving remaining seed to mature on the plant.

Left: Peggy's hoop house that she constructed from T posts and PVC, following a video published by Utah State University Extension (link in protocol); **Right**: Damage to hoop house from winds that gusted 30 minutes after harvest!

RESULTS

- There was no viable seed produced from any of the lettuce varieties grown uncovered.
- This is compared to the hoop house, **where 4 of the 5 varieties produced viable seed**, with a 8% chance (P=0.08) the seed produced is due to chance and not the fact that it was protected.

Table 1

Production dates for lettuce varieties grown in a hoop house and uncovered (brackets). All varieties were seeded May 3 and planted Jun 15.

Variety	Type	Bolting	Seed Set	Harvest
Black Seeded Simpson	Green Leaf	Jul 16	Aug 20	Aug 24 - Sep 14
Lovelock	Freckled	Aug 24		None
Red Oak Leaf	Red	Jul 24	Aug 24	Sep 7 - Sep 21
Dark Lolla Rosa	Red Curly	Jul 24 (Jul 30)	Aug 24	Sep 7 - Sep 21
Jericho	Green romaine	Jul 24 (Jul 30)	Aug 24	Sep 7 - Sep 14

- Scaling up her numbers to 100 plants of each variety, average retail value at $3.30/gram was **$783**.
- With entire hoop house planted, Peggy would be able to sell enough seed over **2.21 years** to pay for the hoop house materials.

Table 2

Results for lettuce seed production in the hoop house. Lettuce planted uncovered produced no viable seed.

Variety	Germ.(%)	Volume	Retail value at $3.30/ gram for 100 plants	Years to pay off hoop house purchase
Black Seeded Simpson	88		$1610	0.71
Lovelock	-		-	-
Read Oak Leaf	93		$367	3.11
Dark Lolla Rosa	91		$847	1.35
Jericho	97		$311	3.68
Average	**92**	**139**	**$783**	**2.21**

- Because the experimental design did not have replicates of each variety in the hoop house and uncovered, we are unable to use statistics to conclude which variety is most productive. But the trends of seed produced follow Peggy's observations from previous years of growing: Black Seeded Simpson is a heavy seed producer while Lovelock bolts very late!

Top left: Dark Lolla Rosa bolting inside hoop house; **Right**: Black Seeded Simpson at seed set inside the hoop house. **Bottom left**: Planting lettuce outside in the uncovered beds as a control; **Right**: Germination test for the viable seed produced from the hoop house.

TAKE HOME MESSAGE

Hoop houses appear to be an **effective way to grow lettuce seed in northern Ontario**.

There was variation in the weight of seed production from the five lettuces tested. The differences match Peggy's observations from previous years but will need to be validated with additional replicates in future years.

Even with paying off hoop house materials in 2.21 years, this data tells Peggy that selling lettuce seed wholesale by weight is not going to be profitable. Based on a suggestion from High Mowing Seeds, Peggy will try pricing by **seed count** for greater profit. She can do this in future years by calibrating the weight or volume of 1,000 lettuce seeds.

Peggy will also evaluate the return on investment of a more **wind-resistant steel frame** to avoid the destruction by winds experienced this year. Specifically, she's thinking of using one of her exisiting Hanley caterpillar tunnels with a taller gothic peak, and forcing sides up high to allow for sufficient ventiliation. Since lettuce plants are ~ 4' tall at seed set, Peggy must be able to keep good airflow so the seeds don't overheat.

Thank you to Aabir Dey of the Bauta Family Initiative on Canadian Seed Security for his guidance with the protocol for this project.

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Farmers as Soil Keepers

Envisioning a regenerative and vital future for Ontario agriculture

by Tony McQuail

I came away from the recent Ecological Farmers of Ontario Conference with a sense of hope and a sense of urgency. The hope comes from seeing such a large gathering of such a diverse group of ecological farmers. The urgency comes from my sense that we have answers to some big challenges facing our society that we need to be sharing widely and more effectively.

The Ecological Farmers Association of Ontario (EFAO) was born out of an idea by a small group of farmers who came together 40 years ago believing that it would be better to work with nature than fight against her. We believed we would do better if we shared information on our successes, our mistakes and learned together.

And while we still have lots to learn, we have learned a lot. We know how to make the transition from an industrial-dependent farm to an ecologically-resilient one more smoothly than we did 40 years ago. We know how to manage crop systems and livestock to sequester atmospheric carbon, to build soil organic matter, nourish soil biology and grow nutrient-dense plants and livestock to nourish healthy people. This is valuable and important knowledge -- and it is needed now.

We live in distressing times: a climate train wreck approaching; degenerative diseases rampant; politicians, many academics, and most media in denial. At times like these I find Steven Coveys concept of our '"Circle of Concern" and our "Circle of Influence" to be very helpful. Basically he says if you spend too much of your time worrying about things you can't influence your "Circle of Influence" shrinks, but if you spend time working in the areas where you can have an impact your influence increases outward and improves things that you are concerned about. This is part of what keeps me hopeful as an ecological farmer.

First being connected to the soil and learning to work with natural laws and systems not only nourishes the soil – it nourishes the soul. And, as I look at the big problems we face as a society, it seems to me we have a lot to offer.

What can EFAO do within its Circle of Influence? What if EFAO convened a gathering of representatives from other organizations interested in organic and ecological agriculture and its impacts? This would include the organizations that partnered with EFAO in supporting the recent conference and others that EFAO works with or knows of. The goal of this gathering would be to envision how to help Ontario agriculture evolve into an ecologically-regenerative system and how to enlist the broader public in this process.

The first step would be to think small and big -- what is needed to encourage and support individual farms in this transition? What choices and actions would help the whole agricultural and food sector make the shift? Once we, as a sector, have a coherent vision that we can articulate, we need to share it.

We need to think broadly. Like the fungal hyphae in a healthy soil, we need to reach out and connect with people throughout our society and link those who will support this transition. We are well placed because ecological farmers are often part of the local food and direct marketing movements, so already have a network of customers and contacts with whom they can share this information.

I envision creating a network of "Soil Keepers" who pledge to protect soil in their care from erosion, to manage it to increase its carbon content and biological vitality, and to make purchasing decisions which support an agriculture that is regenerative and soil enriching.

By being a "Soil Keeper" they are choosing to be part of the solution to climate change, biological diversity and degenerative diseases from the "ground up." This could be a pretty exciting movement to be part of, particularly if there were field days and work camp opportunities for folks who don't have their own soil to come out and connect with those who do.

As well, having a coherent vision that we develop as a group of organizations would put us in a strong position to go to various levels of government to encourage their support for this transition.

To the Minister of Agriculture we could say that a shift to an ecological agriculture has many benefits to farmers and society: it can lower input costs, increase resilience in the face of drought and flooding, and produce healthier plants and livestock.

To the Minister of Finance we could say increasing soil organic matter will be the least cost method of addressing climate change while reducing government expenditures in areas like health care and encouraging economic development.

To the Minister of Labour we could recount the benefits of independently -owned value chains that foster an agriculture of the middle and vibrant rural economies.

To the Minister of the Environment we could say ecological farming offers benefits to the ecosystem, including improved water infiltration and holding capacity with increased species diversity above and below ground.

To the Minister of Health we could say the nutrient density of food and the environmental benefits of this type of farming will have immediate and long-term health benefits.

The big take home message to all is returning atmospheric carbon to the soil through photosynthesis will be the least costly and most beneficial way to start bringing down the burden of CO2 greenhouse gases in the atmosphere.

And the exciting thing is, we already have the equipment to do the work -- we just have to manage the system differently and biologically to get the job done.

What a hopeful task for EFAO and its partners in the coming years. The time to act is now!

EFAO Events Listing

JANUARY 2019

Jan 10: KTM: Farmer-led Research Roundtable
12 pm - 3 pm
157030 15th Line, Lakeside – West Region
Are you curious about doing research for your farm? Come on out to this informal gathering hosted by Ann Slater of Ann Slater Organics and joined by Sarah Hargreaves, EFAO's Director of Research. The meeting will focus on variety trials for the upcoming year. There will also be time to share and get feedback for all research ideas, or work through an application for farmer-led research, due January 31, 2019. Lunch provided.
Cost: Free for members/$10 for non-members

Jan 24: KTM: Farmer-led Research Roundtable
7:00 pm - 9:00 pm
215 Phillips St, Kingston – East Region
Hosted by Annie Richard of Kitchen Table Seed House, you'll learn about farmer-led research, share your research ideas and get feedback from fellow farmers. You can also work through your FLRP application, due January 31, 2019.
Cost: Free for members/$10 for non-members

Winter Workshop Series

All workshops at OMAFRA, 1 Stone Rd, Guelph
Cost: $40/member; $60/non-member

Jan 25: Workshop: Advanced Principles of Soil Health
9:00 am - 12:00 pm
This intensive workshop will give an overview of soil health principles. Topics will include soil cover, crop diversity, minimizing disturbance, maximizing days of living soil cover, organic inputs and water management. This workshop will also launch EFAO's new Soil Health Program -- workshops and farm tours that include a soil health benchmark test for your farm. Appropriate for farmers of all scales.

Jan 25: Workshop: Tools and Systems to Maximize Efficiency
9:00 am - 12:00 pm
Join the conversation about tools and systems on the farm. Led by seasoned market gardeners and tool-makers, this workshop will feature an inside look at tools and systems to maximize efficiency and profitability. Presenters will also discuss their experience with tool customization and group building, and discuss the potential for leading collaborative fabrication workshops with other farmers in your region. Workshop best suited to market gardeners of all scales with 5+ years growing experience.

Jan 25: Workshop: Planning for Climate Resilience
1:30 pm - 4:30 pm
Many farmers are unsure of how to adapt their farming strategy to an increasingly variable climate, how to prioritize or hold off investment, because – what is coming at us next? In this interactive workshop, the presenter will first set the stage by summarizing climate impacts on farming. Then, a framework will be introduced showing how to conceptualize climate resilience on your farm. Planning for climate resilience should take a whole-farm perspective and address the choices of crops and livestock, growing and soil stewardship practices, but also value-adding and marketing strategies. In working groups, participants will apply this framework to their own farm and share their experiences, concerns, and solutions.
Cost: $40/member; $60/non-member

Jan 25: Workshop: Exploring Seasonal Migrant Labour
1:30 pm - 4:30 pm
Labour on the farm is one of the most important and complex considerations. If you've thought about what it might be like to transition your farm to one that employs seasonal migrant labourers, you won't want to miss this session. Join us for an interactive discussion on the ins and outs of this labour model with perspectives offered from both farmers and workers. This session is best suited to vegetable growers of all scales.

Research Notes

EFAO's Farmer-led Research Program Summary 2018

The Ecological Farmers Association of Ontario's Farmer-led Research Program supports farmers to answer their most challenging on-farm questions. In 2018, 20 farmers conducted 14 research projects - the results of which help them to build resilient ecological farms. Full summaries of the projects are available in January 2019 at efao.ca/research-library.

SOIL HEALTH

Val Steinmann and Brent Klassen, Heartwood Farm and Cidery - Central
Does biochar improve tree growth in a newly established apple orchard?

- Val and Brent were curious to know if biochar will help regenerate soil in their young apple orchard and "help to set in motion biological activity and nutrient retention".
- Researchers have documented benefits from biochar in arid and tropical soils, which vary by soil fertility status and biochar quality. Much less is known about biochar's effect in temperate regions, but there is anecdotal support for biochar use from some farmers in Ontario.
- In the first year of application, Val and Brent detected no effect of the biochar amendment on soil microbial activity, as a proxy for soil health.
- They also detected no changes in tree health in the first year of application.
- Val and Brent will continue to monitor soil and tree health in future years.

Brent Preston and Gillian Flies, The New Farm - West
Does tarping between succession plantings reduce the amount of tillage and labour required for organic salad production?
Please see page 11

Angie Koch, Fertile Ground Farm - West
Does a spader to reduce discing help improve soil structure?

- Results coming next year

Ken Laing, Orchard Hill Farm - West
Do winter-killed cover crops provide cover in fall and winter with suitable field conditions to no-till plant spring cereals?

- Results coming next year

DISEASE & PEST CONTROL

Felicia Syer Nicol, Sycamore Farm - West
Is Fusarium infection in garlic reduced with a copper spray or biostimulant?

- Felicia grows nematode-free garlic, which she sells as clean seed. She'd like to prevent loss to Fusarium and tested a copper spray & biostimulant spray as potential ways to control the fungus.
- The dry conditions and good seed garlic led to low Fusarium pressure this year.
- Compared to a no-spray control, Felicia detected no effect of copper spray or RhizoVital® on her garlic yield.
- Felicia is curious to try again in a year when Fusarium pressure is worse.

Joseph Imre and Jazmin Bansagi, Seven Fields Farm & Orchard - East
Do organic sprays differ in their efficacy against disease in black walnut?

- Joseph and Jazmin compared organic sprays for managing disease in their young orchard, with the goal of discovering the best organic approach to care for their black walnuts.
- Disease and insect pressure was low on the young walnut trees and there was no clear difference in tree health between those sprayed with neem oil or a combination of copper and a biological insecticide.
- The most significant indicator of fungal infection is early defoliation in the fall. Therefore, Joseph and Jazmin will continue the study for a second year with frequent observations during the end of the growing season to strengthen their overall conclusions.

Jessica Gale, Sweet Gale Gardens - West
Ecology in action for Dahlia production: Can a trap crop lure cucumber beetles and their predators?

- Results coming next year

EFAO's Farmer-led Research Program Summary 2018 cont.

SEED PRODUCTION & BREEDING

Annie Richard and Kathy Rothermel, Kitchen Table Seed House - East
Greta Kryger, Greta's Organic Gardens - East
Rebecca Ivanoff, Unaffiliated - Central
Is it possible to breed an early, blocky pepper with good flavour that is adapted to organic systems in southern Ontario?

- Four growers continued to select and stabilize lines of red and yellow peppers.
- A red pepper from their developing line won a blind taste test and was generally rated with great flavour; measurements confirmed blocky-ness.
- The growers will formalize the stabilization and aim to send the mass selected variety to market in 2020.

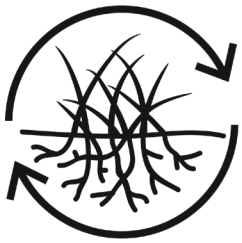
Duane Falk, Mimosa Breeding and Research - Central
Is it possible to breed a delicious winter hardy garden pea for most of Ontario and eastern Canada?

- Duane would like to breed a pea that can be planted in the fall and yield early peas, before the heat and drought set in. He'd like to see early production of high quality peas to supply market gardeners and backyard gardeners without the struggles of early spring planting.
- This breeding project should take 3-5 years to get uniform lines with the combined traits of winter hardiness and quality, which are both complex traits.
- Varieties derived from this project will be released publicly. If deemed commercially viable, the resulting varieties will also be licensed to small seed companies.

Jessica Gale, Sweet Gale Gardens - West
With Jen Feddema, Joanne Feddes, Janis Harris, and Sas Long
What is the best variety of Sweet Pea to grow in southern Ontario?

- Much of the flower seed being produced and used by cut flower growers across Canada is grown internationally in the Netherlands, Israel, and various South American and African countries. This means that varieties are not adapted to the Canadian climate and flower growers can't support local seed houses.
- Jessica wanted to assess different varieties from local seed houses to find the best one for her farm, and she enlisted the help of other flower growers.
- There was not a detectable difference in plant quality among blush or white varieties.
- What emerged for the growers was the importance of growing regionally adapted sweet peas that have a longer bloom period, or resistance to heat waves.
- For Jessica specifically, the process of data collection on bloom period made her re-evaluate the amount of sweet peas she should grow in future years, given its short life.

Peggy Baillie, Three Forks Farm - North
Is lettuce seed production in northern Ontario improved using a hoop house?
Please see page 14



PASTURE REGENERATION

Tony McQuail, Meeting Place Organic Farm - West
Does ultra high density grazing as part of adaptive multi-paddock grazing have merit in Ontario?
Please see page 12

Please turn to pg. 20

Applications for 2019 research projects are due January 31, 2019
at efao.ca/research-submission.

You can **watch EFAO's short film** featuring farmer-researchers Angie Koch, Brent Preston and Annie Richard at efao.ca/farmer-led-research.

Research Notes

EFAO's Farmer-led Research Program Summary 2018 cont.

WEED CONTROL

Pat Kozowyk, Baba Link Farm - West
Ivan Chan, Eden in Season - West
Arthur Churchyard, Eramosa Currants - West
Does comfrey promote growth and fruit production of saskatoon berry and black currant?

- Perennial cover crops have many ecological benefits. However, they may compete with the crop or not provide sufficient weed control.
- In their second year with comfrey, Pat found no difference in saskatoon growth or production compared to shrubs without comfrey; in their first year, Arthur and Ivan collected baseline data; and they will all continue to monitor their crops over the next two years to evaluate the impact of comfrey.
- This year provided insights into how to take practical and meaningful measurements of shrub growth moving forward. For Pat, it highlighted the fact that height measurements of mature saskatoons are imprecise. She will include height measurements in 2019 and then focus only on fruit production and quality thereafter.

Eric Barnhorst, Eva Mae Farm - East
Does planting timing of green mulches affect yield of garlic and labour?
Please see page 13

THANKS TO OUR PROJECT FUNDERS

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The Future of Farmer-Led Research

Reflections from the conference

by Heather Beach & Ralph C. Martin

continued from cover

The conference's final keynote speaker young farmer, Carmen Black, shared the benefits of farmer-led research that go beyond environmental specificity or the farmer's knowledge of their land's capabilities. Carmen learned from her mentor that PFI research is cool and anyone can do research.

In the three years since buying Sundog Farm from her mentor, she has conducted research on pepper and broccoli varieties best suited for her farm, growing techniques to reduce disease in her tomatoes, and cover crops rotated with her CSA vegetables to dually enhance ecosystem services and increase grazing opportunities for her sheep.

Notably, a key benefit she gained through her PFI research is a special language of critical thinking among her farm workers. Producers can be preoccupied with productivity. Haphazard "experimentation" may lead to blame for crop "failure," but farmers' implementation of the research method has given staff a language to reflect, analyze and improve. Black says her research with PFI allows her team to see undesired outcomes as learning opportunities, not blaming sessions. She makes informed choices based on very relevant data collection, her own.

Inspiration and guidance were also flowing outside of the scheduled symposium and workshops. During breaks, the conference centre lobbies bubbled with voices of conference-goers reflecting, debating and reuniting. Faces of young and mature, men and women, and children expressed engagement.

It was particularly exciting for me (Heather) as an agricultural student at the University of Guelph to meet young farmers who had just completed their first season or two and to hear their challenges and plans for improvements. For many first-generation farmers, support to lead their own research builds up an ecological farming resource that can be improved based on data. "It's tradition" can support, rather than monopolize practices, as experiments and experience join forces for better results.

I learned that critical thinking and ecological farming go hand-in-hand. Many concepts in ecological farming are site specific: which variety will grow best in this soil, in this climate? EFAO and PFI show that their farmers are enthusiastic to be at the forefront of uncovering methods of production that complement their farm environment. These organizations give value to each farmer's situation.

It is encouraging for me to see at the EFAO conference how intertwined food production and ecological stewardship has become. No longer does a young person with a passion for sustainable food production have to choose between the "doing" and the "influencing" worlds of farming and research.

As a round-the-block researcher, I (Ralph) was thrilled to witness the energetic interactions during poster presentations of farmer researchers and then to later listen to numerous hypotheses suggested for testing in 2019 and beyond. In less than three years since our first FLR Advisory Panel meeting, the program is hopping.

As humanity approaches increasing climatic variability, precarious losses of species and excess biogeochemical flows of flows of nitrogen and phosphorus, FLR can also represent FLResilience, FLRegeneration and FLRestoration. Farmers in the FLR program are experimenting and practicing for the future.

Funding for the FLRP is provided by the Ontario Trillium Foundation, George Weston Limited and Loblaw Companies Limited and the Robert and Moira Sansom Ideas Foundation, a fund within London Community Foundation.

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Main Farming Enterprises: ☐ field crops ☐ livestock ☐ fruit ☐ vegetables ☐ specialty items

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_____

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