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VOL. 44 | ISSUE 4 | WINTER 2023



Livestock Guardian Dogs

Ecosystem Restoration

Farming Game Changers



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by Bryan O'Hara

On the cover

Xiaobing Shen shows off some of the luffa that he grows, on a September 18th Field Day at Long Road Eco Farm, in Harrowsmith.





What We Do

Established in 1979 by farmers for farmers, the Ecological Farmers Association of Ontario (EFAO) is a membership organization that focuses on farmer-led education, research, and community building. EFAO brings farmers together so they can learn from each other and improve the health of their soils, crops, livestock, and the environment, while running profitable farm businesses.

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 cultivates resilient, diverse, equitable communities.

Mission

EFAO support farmers to build resilient ecological farms and grow a strong knowledge sharing community.

Ecological Farming in Ontario

Ecological Farming in Ontario is published quarterly by EFAO as a benefit of membership to help keep farmers and supporters informed and in touch with one another through articles on relevant farming topics, current farmer-led research, upcoming events, and other news of interest.

Ecological Farming in Ontario is printed on Rolland Enviro-100 paper, which contains FSC certified 100% post-consumer recycled fibres. Back issues can be found on EFAO's website (efao.ca) or are available upon request. Unless otherwise noted, articles may be reprinted or adapted if credit is given.

For information about advertising please visit efao.ca/sponsorship-ads

Deadline for Spring 2024 issue: January 15th.

Help make *Ecological Farming in Ontario* a farmer's journal! Submit articles, photos, opinions and news to the editor, Laura Northey, at editor@efao.ca. We reserve the right to edit submissions for space and/or clarity.

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A Message from the Executive Director

Dear Members,

The EFAO conference is coming up on **November 29th and 30th in London!** This is the first fully in-person conference since 2019 and it's our 10th annual conference, which both feel like milestones to celebrate. So let's take a moment to reflect on the conference, how it came to be, and how it has evolved.

For years before our conference was born, EFAO heard from members who would travel to the Pennsylvania Association for Sustainable Agriculture (PASA) annual conference or the Atlantic Canada Organic Regional Network (ACORN) annual conference in the maritimes. They raved about the practical and inspiring workshops, shared meals, and music.

Inspired by the enthusiasm for this type of knowledge sharing and community building, the EFAO conference was launched in 2014. It was held in Orillia at Geneva Park, which was then a YMCA facility. It was a fantastic first conference in a beautiful outdoor setting, on EFAO's 35th Anniversary. I will never forget the 35 cakes that were baked by members and assembled into one giant and delicious conference cake!

We have since held the conference in eight different locations, in an effort to move it around the province while being limited by the availability of venues that can accommodate our conference goals: lots of simultaneous workshops, a large banquet hall for shared meals, chefs who will work with farm produce, and a space big enough for a bustling Trade Show. In addition to Orillia (2014), the conference has taken place in London (2015, 2018), Kingston (2016), the Blue Mountains (2017), and Belleville (2019), with regional gatherings last year in Sudbury, Hamilton and Batawa. An online conference was held in 2020, 2021 and 2022.

You will find several articles in this issue that we hope entice you to join us for this year's conference! Fans of *No-Till Intensive Vegetable Culture* by Bryan O'Hara will



appreciate the review by Jason Hayes on page 25, and will be pleased to know that Bryan will be offering three workshops at the conference this year. An article on hazelnut research and breeding by Lindo Grimo on page 16 is a great primer for her session on nut production at the conference. And in honour of one of our favourite new conference sessions after last year's glowing reviews: *Farming Game Changers* on page 19. You'll also find other conference information on page 4.

The Conference is a celebration of EFAO's members and the organization's work each year. One important component of the conference in recent years has been EFAO's annual Research Symposium, where research conducted by members through the Farmer-Led Research Program is shared. It is one of my favorite EFAO events of the year, highlighting the innovations, ingenuity and hard work of our members. This year's [Research Symposium](#) will take place online ahead of the conference on **Monday November 27th**.

We hope you are as excited as the EFAO staff and board to come back together for the full conference this year. There will be over 35 workshops, 2 keynote presentations, music and dancing, and of course – lots of opportunities for conversation and connection as we pause, reflect, and refuel with new ideas, relationships and inspiration for the year ahead.

For more information about the conference and to register, visit conference.efao.ca

Hope to see many of you there!



Conference session topics will include:

- **WEDNESDAY KEYNOTE:**
Agroforestry Across Watersheds
- **THURSDAY KEYNOTE: Homelands & Homewaters:**
Mnoomin (wild rice) Resurgence and Contaminants Testing
- No-Till Intensive Vegetable Culture with Bryan O'Hara
- Wetlands on Farms: Conservation & Management
- Growing Small Grains in Ontario
- It all Starts with Water: Permaculture and the Order of Design
- Tools for Managing Pasture Using Nature's Model for Ecological Sustainability
- Alternative Land Access: Farming on Public Lands
- Nitrogen Calculations for Cover Crops
- Innovations in Rainwater Catchment Systems
- Farming Game Changers
- A Year in the Life of a Flower Farmer
- No-Till Potatoes: A Farmer Researcher Panel
- Growing Hazelnuts and other Edible Tree Crops in Ontario
- Ag Policy Roundtable
- Kids on the Farm: Getting Creative with Childcare
- Irrigation: Things I Wish I Knew When I Started
- Pig-Proof Infrastructure for Pastured Pork Production

Make a Nomination for the 2023 Carrot Cache Innovation Prize

Did you come up with a new approach to an old problem this year that deserves some recognition? Know a farmer who has found a way to save themselves time and money? The Carrot Cache Innovation Prize is back for its 10th year at the EFAO Conference! A \$1,000 prize will be awarded for innovative, low-cost solutions to planting, harvesting, and managing food grown on an Ontario urban or rural organic farm.

Submissions will be shared with attendees of the 2023 EFAO Conference, who will have the chance to vote for their favourite on-farm innovations. The winner will be announced at the conference. Visit conference.efao.ca/#prize to find a link to the submission form!



Additional Conference Details

CHILD CARE will be available from 8:30am to 12pm and 1:30 pm to 5:15pm at the conference each day. The conference child care room is run by volunteers: if you are interested in volunteering in exchange for a half-day conference pass, please contact conference@efao.ca.

YOUTH UNDER 18 who wish to attend conference sessions can register for the conference at a 50% discount on member early bird rates: \$122.50 for a full conference pass and \$65 for a single day pass. Please contact conference@efao.ca for more information.

RIDE SHARING is a great way to save on money, reduce emissions, and make new friends! A ride sharing spreadsheet has been created for conference attendees to post rides being sought or offered. Please add your name to the list – you can find it at conference.efao.ca/#moreinfo.

CONFERENCE MEALS will feature food donated and provided by EFAO members and other local ecological farmers and food providers. You don't want to miss the Wednesday Banquet Dinner! A delicious meal, musical entertainment, and good conversation with new and old friends. If you're interested in contributing ingredients to conference meals please contact naomi@efao.ca.

MUSICAL ENTERTAINMENT at this year's conference will be provided by the [Kumao Latin Band](#), a nine piece salsa band from Hamilton that loves bringing Latin American music to events and communities! If you're keen to get your feet moving, you're invited to join a salsa dancing lesson!

Visit conference.efao.ca to find more information about accommodations, accessibility, and to register!

Welcome Taryn!

Join us in welcoming Taryn Bobiwash to the staff team as EFAO's new Indigenous Outreach and Engagement Coordinator. Taryn is an Ojibwe & Odawa member of the Turtle Clan from Serpent River First Nation. As the Indigenous Outreach and Engagement Coordinator she creates meaningful connections between communities and creates space and learning opportunities for Indigenous Peoples to connect deeply to their lands through various growing and harvesting practices.

Taryn is a full spectrum doula, amateur hide tanner, and visual artist. She is a graduate of Algoma University and Shingwauk Kinomaagegamig with a BA in Anishinaabemowin and Psychology. In 2019 she co-founded the Nimkii Youth Collective which is actively working to revitalize language and culture on the land. She is dedicated to reclaiming Anishinaabemowin and the traditional art forms, birthing and growing practices of her Nation. ■



PHOTO HIGHLIGHTS





1. Jon Bonaparte chats with Mike MacGillivray as another attendee looks on, at an Aug. 12 field day at Kirkview Farms where participants learned about Rotational Grazing.

2. Participants in Rav Singh's farm event at Shade of Miti in Cheltenham on Sept. 5th gather for the farm tour.

3. Rav's farm tour included an overview of the farmer-led research that she has been involved in this year, growing and observing 5 types of okra for productivity potential in Ontario. She also shared about some of the crops she specializes in, such as bitter melon, and discussed how advocacy around topics like land access make their way into her work.

4. Tara Weerasuriya and other attendees discuss farmer-led research trials and okra varieties at the Shade of Miti field day.

5. Michelle Dang speaks to attendees of a field day at The Carrot Green Roof & Gardens on Sept. 6th in Toronto, where participants learned about beekeeping, rooftop growing, and seed saving, before enjoying a meetup for members of EFAO's network for Black, Indigenous, and people of colour.

6. Gillian Leitch, beekeeper, landscape designer, and member of Toronto's Pollinator Advisory Group shows off some busy bees working away in the hives atop the Carrot Green Roof.

7. Xiaobing Shen walks participants in the farm tour at Long Road Eco Farm through an area of raised beds, Sept. 18. Xiaobing runs a small, mixed, ecologically-run farm raising livestock

and growing speciality crops, and also a prepared food business called Farm Sum Food, which is a key part of the operation.

8. Meghan Brandenburg of Milky Way Farm leads a farm tour on Oct. 4th, describing the regenerative approach she and her partner Jesse Way employ on their 1.5 acre farm just south of Woodstock.

9. Attendees of the Milky Way Farm field day listen carefully as Jesse and Meghan describe how they use the nutrient status of their cover crops and soil to determine plant available nitrogen from cover crops during the growing season.

10. Phil from Black Barn Farms demonstrates how his fencing system works, and describes the logistics and timing of his rotations, at an Oct. 14th rotational grazing field day in Oxdrift.

Calling All EFAO Farmers: Help Us Improve The LiteFarm Experience for Integrated Crop and Livestock Operators!



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LiteFarm, a free and open-source farm management tool tailored for current and aspiring sustainable farmers, is thrilled to invite you to get involved in the co-creation of our integrated crop and livestock module.

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By sharing your feedback, suggestions, and ideas, you'll guarantee that our platform meets the unique requirements of real farms. We'll update our platform several times over the coming year based on your guidance.

Are you eager to embark on this remarkable journey of co-creation? Reach out to us at community@litefarm.org, and let's shape the digital future of sustainable farming, together!

To discover how fellow farmers worldwide, from Ecuador to [British Columbia](#), are contributing to our platform's development, explore our news page.

Surplus Equipment For Sale from EFAO's Living Labs – Ontario Research Trials

RJ Equipment 2 row no-till transplanter – has been used for plug transplants, potatoes and garlic planting – 3 PH – 100 litre water tank – floating row cleaners – variety of closing wheels for tilled or no-till conditions – almost new condition – \$9,000

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Einboch Tine Weeder – 3PH – 60" used very little – \$3,500

Hardi 3PH sprayer – 400 litre tank – high pressure pump – 25 ft boom – used but in very good condition – \$1,500

Contact Ken Laing for more information or to view the equipment:
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or 519-775-2670.

Regenerating Fallow Fields for Organic Production Using Diverse Cover Crops

By Sarah Larsen

Eric Barnhorst is the owner/operator of **Eva Mae Farm**, an organic vegetable farm near Brighton, Ontario.



In 2019, Eric wanted to scale up his land base to produce more vegetables for his growing markets and had a one-acre field in the perfect location for intensive vegetable production.

“It has sandy, well drained soil that warms up well in the spring with good road and water access”, explains Eric. “But the problem was the topsoil was stripped by a previous owner and the organic matter was very low” – too low to grow high quality organic vegetables.

Eric knew one option to regenerate the field was to add tonnes (literally) of mineral amendments to balance the soil, in addition to compost and manure to bring the fertility and organic matter up quickly. This approach, however, would have been so costly that the ideal method to regenerate this field for production weren’t clear. “I wanted to find a balance between speed of recovery and cost to implement, and it’s a big enough investment that I wanted to have some clear data behind the method I chose”, said Eric.

To inform his decision and help other ecological farmers in similar situations, Eric implemented a research trial in cooperation with EFAO’s Farmer-Led Research Program. In spring 2020, Eric installed a randomized and replicated trial with five treatments on the one-acre degraded field.



A view of the field where Eric’s replicates were laid out. He divided a 1-acre field into 20 30’x30’ plots. In each row of 5 plots, he randomly assigned one of 5 treatments. In the fall, the control plots without cover crops died earlier, as seen in the brown rectangles in the photo.

For his control treatment, Eric chose to let the naturalized species grow and to mow them a few times a year (1). He compared this control to a gradient of more intense treatment methods including adding mineral amendments to balance the micronutrients in the soil and letting what was there grow (with periodic mowing) (2); adding mineral amendments, tilling, and seeding to a diverse, full-season mix of cover crops (3); doing the same thing with the amendments and cover crops, and also adding chicken manure (4); and doing the same thing with amendments, cover crops, and chicken manure, and also adding woody compost (5).

Eric had completed previous farmer-led research trials looking at green mulches for garlic and grafting tomatoes, and knew he wanted to set up a trial with

a relatively high number of replicates in order to bring confidence to any differences he was measuring and observing. If there was a difference among treatments, he wanted to see it more than once, twice, or even three times – so he chose to replicate each of the five treatments five times.

To start, Eric measured the micronutrient status of the soil to guide his application of mineral amendments and took baseline soil samples to measure active carbon. Active carbon, also known as permanganate oxidizable carbon or POXC, is a sensitive indicator of soil health that measures a pool of labile, or readily usable, carbon that is available for microbes to process organic material. This microbial activity can, in turn, build organic matter. Therefore, greater active carbon levels reflect



The sorghum sudangrass crop was over 8' tall in woodchip treatments.

driving active carbon. But one year wasn't enough for me to feel confident in this method, so I wanted to track these treatments over a few years to be sure," says Eric.

After conversations with Dr. Ralph Martin and EFAO's research team, Eric decided to continue the trial for two more seasons – while adding complexity to the design.

"Rather than make all of our conclusions based on active carbon, we wanted to see how the treatments affected subsequent crop growth, not just soil health", explains Eric. "So in 2021 we divided the plots in two and planted sorghum sudangrass in half of each plot and re-amended the other half of each plot based on updated soil tests." He acknowledges that "although sorghum sudangrass is a cover crop, we used it as an indicator of potential vegetable crop growth. It has the potential to put on a lot of biomass so we could compare its growth among the treatments."

Throughout the 2021 growing season, Eric measured the aboveground biomass of sorghum sudangrass in the half plots

of each treatment and also continued to track active carbon in the plots with the original treatment and no indicator crop.

In spring 2022, Eric removed the half plots that had sorghum sudangrass from the trial and planted them back to a cover crop to prepare for vegetable production in future years; he planted the half plots that received two rounds of amendments to sorghum sudangrass. Like the previous year, he measured aboveground biomass of the indicator crop and took soil samples to measure active carbon.

"When we look at three years of data on active carbon, aboveground biomass of the indicator crop, and my observations of how the cover crop grew, we saw some consistent trends," says Eric. "Overall, this project showed me that planting a diverse full-season cover crop on soil that is mineral-balanced is an effective way to regenerate degraded or 'worn out' sandy soil. If the goal is long term soil health, using cover crops is a no-brainer." He also observed that "diverse full season cover crops maintained soil health on my productive land and helped clean up weeds, especially when used for two consecutive years".

However, when Eric evaluated the cost of each treatment relative to the biomass of indicator crop produced, he found that the intensive treatments with manure and woody compost were

greater potential to build soil organic matter and regenerate soil health.

Over the first season in 2020, he observed plant growth (naturalized species in the control and mineral amended plots and cover crops in the other treatments), tracked costs and labour, and took follow-up soil samples for active carbon in the fall and following spring.

In that first year, Eric saw consistent results across replicate plots. While micronutrient amendment alone did not increase active carbon, Eric saw active carbon increase in the other treatments. There did not seem to be an added soil health benefit from adding chicken manure or woody compost with cover crops. The diverse full-season cover crop, it seemed, was doing the bulk of the work towards regeneration.

"When I looked at the soil data, my observations with how the plants were growing, and added up the costs and labour for each treatment, the cover crops seemed to be the main factor



Eric observed a less diverse cover crop of primarily sorghum sudan grass, radish, and oat regrowth in plots with chicken manure.

more cost effective for boosting next-year production than simply using the diverse cover crop mix alone. His choice of method moving forward will depend on the return on investment of the following cash crops.

“I am pleased to have this data to help make decisions on the farm moving forward, but I am also reminded that I can’t bootstrap healthy soil in one year”, states Eric. Even with gains in active carbon and clear yield benefits as seen in aboveground biomass, production areas in other parts of the farm that have had nutrient balancing and organic amendments over years looked better than the highest input treatment he compared in this project. ■

Sarah Larsen is EFAO’s Research & Small Grains Program Director and also supports soil health components of EFAO’s education programs. She holds a Ph.D. in Soil Microbial Ecology from Iowa State University, and along with her partner and their daughter, tends the land that they call Three Ridges Ecological Farm near Aylmer, Ontario.

Read Eric’s full report at:
efao.ca/research-library/

Want to be a farmer-researcher like Eric? Have an idea for a farmer-led research trial that might answer some of your own on-farm questions about cover cropping, soil health, or other management practices? Attend the Farmer-Led Research Symposium online, Nov. 27th, 2023, and then come out to the EFAO Research team’s open office hours to chat about your ideas. All are welcome! More info at efao.ca/events.

The deadline to apply for EFAO’s Farmer-Led Research program for 2023 is January 14th, 2024. To learn more visit efao.ca/call-for-curiosity-2024.



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December 13, 2022: 12:00pm - 1:00pm
January 3, 2023: 12:00pm - 1:00pm
January 10, 2023: 12:00pm - 1:00pm
Or by appointment: sarah@efao.ca

Apply for funding.

Application Deadline: January 14, 2024 @ 11:59pm
www.efao.ca/funding

It's a Dog's life at Drover's Way Farm!



Pyrenees dogs guarding the flock in autumn. Photo credit: Sarah Loten

by Sarah Loten

I was very concerned, one day in late fall, as I looked for Joe. I had looked everywhere. Normally, he would be waiting for me to bring his food, the daily dollop of dry kibble that was payment for his work. Old Joe, as he came to be known long before he acquired that age in years, was one of the most loyal of livestock guardian dogs. He lived day and night with his family, which were his flock of 700-1000 sheep. He saw us as co-managers of the Drover's Way Farm flock, here in eastern Ontario. We all knew that his presence and devotion was critical to keeping these sheep alive — more than anything we could do as mere humans.

Old Joe would bark, urging the sheep away from predators when he sensed

them about. He led the sheep to areas of safety ahead of bad storms. Joe would always pick a high point in the field where he was able to see, clearly, any threat coming into his fold. He always sat beside the sickest of animals when he knew they needed our attention. He would stay behind with a ewe who was lambing, and her newborn lambs. As gentle as he was with newborn lambs, he could be a streak of fury when a coyote came into his field. Old Joe was constantly fending off predators looking for a lamb dinner. When he wasn't with the sheep on that crisp autumn day, I knew that something was very wrong.

Livestock guardian dogs (LGD's) have been taking care of flocks for thousands of years. Arguably, with evidence of

canine remains in archeological sites of herding societies, LGD's have been used as livestock guardians since sheep were domesticated around 8000 BCE, in the areas of the world that are now called Turkey, Iraq and Syria. There are archeological findings of guardian dogs and sheep remains from 3685 BCE. Their use was recorded by Aristotle in 150 BCE. And images of guardian dogs are found in art from 2,500 years ago.

For much of our farming lives, we have used Pyrenees and Maremma dogs to guard our sheep. Old Joe was a cross between these two livestock guardian breeds. Typically, these dogs (of European heritage) are mostly white. They are large, lithe, athletic and calm. Their colour and demeanor help them

blend with the flock, only becoming visible when necessary. Primarily, they are meant to deter predators, through barking, chasing and territorial marking, rather than fighting or killing. They work well, because they tend to stay with the flock, which they consider their family, full time.

A few years ago, despite all the work that our Pyrenees/ Maremma's were doing, we were seeing a lot of kills, primarily from coyotes. Weaker lambs were also being attacked by ravens as they had little defense in the first few days of life. At one point, we were losing up to 100 lambs/ewes in a grazing season. We increased electric fencing, used lighting to illuminate areas where predators might lurk, increased grazing movement, and yarded them in heavily fenced areas at night, but the losses were still increasing. It became clear that we had to get a more aggressive livestock guardian or house sheep full time, which we did not want to do, for ecological reasons. We graze 600+ sheep and their lambs on 300 acres of permanent pasture land, for around 7 months of every year.

We were told about a breed of guardian dog from Armenia, called the Armenian Gampr. I was intrigued, since Armenia and Turkey are the birthplace of

livestock guardian dogs. We discovered a breeder near us who had imported Armenian Gamprs a number of years ago. She was breeding selectively for farmers and homesteaders who wanted an aggressive guardian against predators that was also able to live within a family farm environment without being aggressive to humans.

The Gampr fits this role very well. In Armenia, they typically live in semi-nomadic camps with shepherds and their families during the grazing seasons. They have to be gentle with even the youngest family members, yet intelligent enough to deter unwanted human interference. They also have to have a strong instinct for aggression towards animal predators who could threaten large flocks which, in semi-arid regions, are often dispersed over larger areas.

When we brought our first Armenian Gampr pup home, we were amazed by his nurturing and protective instincts. By six months, Hayk would nose younger weak lambs, staying with them until they got on their feet and were nursing well. If they lost track of their mother, he would gather them in a warm spot in the yard, staying with them until we noticed that there was a problem. Subsequently, we bought another Gampr, Tig. Within six months, we had fewer

losses to predators. After about 12-18 months, we stopped having coyote kills altogether.

The combination of the Pyrenees dogs we have now, who live full time with the flock, and the Armenian Gamprs that are on guard, using our house (camp?!) as the headquarters to guard from, works remarkably well. The Pyrs sound the alarm if coyote activity is sensed or heard. They bark and defend, staying close to the flock and moving the sheep away from the predator. The Armenian Gamprs hear the alarm barks and the coyote calls, and rush to the scene with a powerful stride, covering 100 acres in minutes. The Gamprs then go on the attack, chasing the predator away from their territory which extends from the house/camp to the fence lines. If the predator continues to threaten and doesn't leave, they will attack and kill, which isn't as typical for the Pyrenees. But the Gamprs are bigger and more powerful dogs than the Pyrs, so usually the threat of their attack is enough to send a predator on its way. When the threat subsides, the Gamprs will work the perimeter of the farm, covering the edges of the pasture, trotting, marking, and checking for risk. The Pyrs will settle back within the flock and the Gamprs will settle either on high ground just outside the flock, or they might come back to the house to await further alarms by the Pyrs.

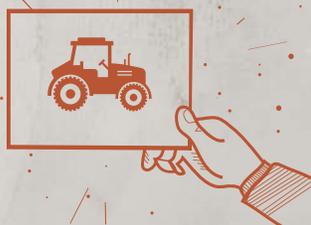
The guarding process between the two breeds is so effective on our farm that we recently imported Hova, a female Armenian Gampr, from an isolated herding community near the Armenian/Turkish border. We want to encourage greater genetic diversity in Canada for this relatively rare breed as we think it has great potential for farms like ours. Hova, like her Canadian-born mates, loves people. At 15 months of age, she is venturing out into the fields to take her place in the pack of dogs who keep our flock safe.

Old Joe, the dog who began this story, was with us for many years. He was a sentient presence, a protector, a nurturer, and a work partner. He was 'just a farm dog,' but like all his compatriots, he was

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Classifieds also appear on the Opportunities page of the EFAO website.





An Armenian Gampr tolerating a Border Collie pup. Photo credit: Sarah Loten



A livestock guardian dog stays with a ewe and her newborns until they can rejoin the main flock. The ewes keep their lambs separate in a sheltered spot (often a hedgerow) until they are ready to follow the grazing sheep, usually within a few hours. Photo credit: Sarah Loten

so much more. LGD's are the cornerstone of sheep grazing operations. When Old Joe went missing that day, and we couldn't find him, I knew he had done his last shift at Drover's Way Farm. I found him on a high knoll in our orchard field, an area that was an easy coyote trap for ewes that came to graze apples. Joe had died of old age while protecting his flock, doing the work that he was meant to do. ■

Sarah Loten is a farmer and shepherd (sheep-herder?) at Drover's Way Farm in Perth, Ontario, where she has been tending her flock for over 25 years, with the help of an ever-changing crew of canine companions.

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A Letter to My Former Self

By Ann Slater

Dear Ann,

I think what would surprise you most about farming today is how many more female farmers there are and how many more small scale market gardeners. As I recall, just about the only source of information on small-scale market gardening in the 1980's was Eliot Coleman's, *The New Organic Grower*. There are now lots of books and magazines, along with completely new ways of sharing information like websites, podcasts, webinars and videos. Sharing knowledge among farmers, through EFAO farm tours and the newsletter, continues to be a great way to learn from the experience of and connect with other farmers.

One of the more recent benefits EFAO has created is the Farmer-Led Research Program. I have taken part in a couple of research projects, first multi-farm lettuce trials and later my own comparison of the yield difference (or as it turned out lack of difference) of three versus four rows of beets in a bed. Being part of the Farmer-Led Research Program has given me good insight into how to do my own variety trials or comparisons of growing techniques.

Just as you did, I keep in mind the need to continue to learn as much as I can about my own fields, to strive to rely on the resources on my own farm and to work in partnership in nature. These are things you learned in the early days of going to organic farming and EFAO conferences and meetings. The increased interest in and information on market gardening and organic farming has also brought with it, an increase in businesses with something to sell me, whether that be organic fertilizers, organic pesticides, growth stimulants, tools, computer programs or equipment. I remain cautious about spending money on inputs, keeping the commitment to

relying on the resources on my own farm. I still have the flock of sheep, although it has become smaller so as not to take up too much of my time in the growing season, but it does provide the manure which becomes the fertilizer to grow the vegetables.

My major input purchase continues to be seeds. There is more interest now than 30 or 40 years ago in saving seeds

on market gardens and in protecting older, open-source seeds. This is partly due to fewer and fewer multinational corporations controlling more and more seed across the globe. But it is also a way to rely on the resources of your own farm. I have found it a challenge to find space to allow seeds to mature and the extra time to care for plants intended for seed. Good quality seed which germinates well and grows as advertised

remains a necessity. There are more seed companies now selling organic and untreated seed, some catering more to home gardeners, some with more focus on market gardeners. Just as you did, I rely on seed catalogues and seed packages for information on how to grow specific vegetables, as well as for inspiration and ideas of new crops or varieties to try.

Who would have thought that lettuce would become my most important crop. I have found that in a small market garden I need crops which can provide a good harvest from a small area, as well as produce that people buy on a weekly basis. It took me years, really decades, to figure out how to grow lettuce that tastes good throughout the season, which grows to full size without bolting in the summer months, and is attractive to shoppers. The most important step in becoming more successful at growing lettuce has just been figuring out what varieties do best in each season on my farm, with my soil and my climate. Based on my own experience and EFAO's Farmer-Led Research



Ann at the farmers' market in 2007



Program lettuce variety trials, if I were to only grow one variety of lettuce, it would be a red Batavian or summer crisp lettuce called Magenta. Over the years, customers have become familiar with and come to enjoy both red and green Batavian lettuces.

There are many crops you grew which I no longer grow or now grow just for myself – sweet corn, broccoli, cauliflower, shelling peas, and garlic to name a few. I stopped growing some crops because they simply did not provide enough money for the space or labour they took in the gardens, others because they did not fit well in my work or rotation schedule. I also realized crop diversity is good, but too much diversity takes time away from more profitable or reliable crops. One of the advantages of selling at the farmers' market is that there are other farmers and market gardeners who help give customers a greater selection of produce.

I have come to view winter as a time to rejuvenate. There were times I thought about and tried some winter growing in the hoop house but I realized my body and my mind needed downtime. I still do not take much down time from May until October, regularly working seven days a week and ten to twelve hours a day. Although I welcome the down time in the winter, I do make an effort to stretch my outdoor harvest season into November. I have figured out that radishes do much better planted in August and September than in the early spring as suggested on seed packages. I have found greens you did not know about, which also do well planted in August and September and then harvested in September, October and November – greens like arugula, mizuna, bok choy, along with collard greens, escarole, kale and Napa cabbage, which need to be planted a month or so earlier. Over the years I also discovered quick growing white turnips and half-long daikon radishes. I gave up on trying to grow carrots for summer harvest. Planting carrots in late July and early August avoids much of the damage from carrot rust fly, and harvesting carrots in late October and November improves their flavour.



There is much more I could share with you, like the value of a wheel hoe, how I cope with an ever changing climate, how a caterpillar tunnel has turned tomatoes into a reliable or more important crop or how much more plastic is now being used on farms, including market gardens, but this is enough for now.

Ann Slater farms in southwestern Ontario. She is a member of the NFU Climate Change Committee and its CFRA Working Group. She also served as EFAO president in the early 2000s.

Sincerely,
Ann Slater ■



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Hazelnut Breeding and Research in North America

By Linda Grimo

The hazelnut industry in North America has grown tremendously in the past 40 years as the result of outstanding research and breeding. Breeders are seeking to create a hazelnut tree that is Eastern Filbert Blight (EFB) resistant, bud mite resistant, winter hardy, and ideal for either the kernel or in-shell markets, with a distinct flavour.

Across the United States, leaders from their respective hazelnut industries at Oregon State University, Rutgers University, University of Nebraska at Lincoln, and the National Arbor Day Foundation are collaborating to develop hazelnut hybrids (*Corylus americana* x *C. avellana*) adapted to eastern North America. Private breeders and other universities in the US and Canada also contribute to this work on a smaller scale, but their work is equally important.

Oregon State University (OSU)

Oregon State University Professor Shawn Mehlenbacher has made a tremendous impact on hazelnut breeding and the genomics of the hazelnut. Over the past 30 years Shawn has released many cultivars (cultivated varieties) that are EFB resistant to the Oregon strains of the fungus. Acreage in these selections has increased in Oregon from 30,000 acres to almost 90,000 acres in less than 20 years.

Mehlenbacher's work on genetics identified the DNA markers on the gene of resistance named 'Gasaway' which has been the primary gene of EFB resistance for the OSU breeding program. Mehlenbacher collected hazelnut germplasm from around the world to further develop this program. These new genetics also introduced other genes of resistance for EFB that will allow the program to use crosses

with each parent having a different gene of resistance, instead of just relying on 'Gasaway'.

In Ontario, many growers have planted Yamhill, Gamma, Jefferson, Theta and other cultivars developed from Mehlenbacher's breeding program.

Rutgers University

Dr. Tom Molnar has made a name for Rutgers for his studies on EFB and for breeding hazels that will thrive in eastern North America. Working under the esteemed researcher Dr. Reed Funk, a professor at Rutgers University who focuses on the Eastern Filbert Blight that has been killing off hazels in North America for decades, Dr. Molnar collected hazel branches that were stricken with EFB from all over Canada and the United States. Through his research he has discovered there are 12 strains of the fungus. The strains vary by location, so some trees have survived because they carry resistance to the strains in their area, but might not grow as successfully in other areas. For example: the variety Yamhill, which has the 'Gasaway' gene, grows exceptionally well in Oregon but gets EFB in Ontario because Ontario has other strains of EFB that Yamhill cannot fight as effectively.

Dr. Molnar traveled the world with Dr. Mehlenbacher, collecting hazels to introduce diverse genetics into his breeding program. Dr. Molnar has



Mehlenbacher hosting a meeting of breeders in Oregon.

several breeding plots and has used these collections to select hazelnuts for the eastern climate. He also has an entire research plot dedicated to the hardiest hazels from his travels.

In 2020 Dr Molnar released four hazelnut cultivars that have shown EFB resistance in all their trials. Since his trial sites have all 12 strains of EFB, they had the ability to select resistant trees that will perform well for Ontario growers. These first cultivar releases include 'Raritan' and 'Summerset', and are now being planted in southern Ontario. We look forward to further releases suited for the colder Ontario climates.

Upper Midwest Hazelnut Development Initiative (UMHDI)

While the OSU and Rutgers programs were breeding primarily European hazels there was little being done to breed for cold hardiness until 2007.

The UMHDI formed as a collaboration between the Universities of Wisconsin



Dr. Molnar at a breeding plot in New Jersey.

and Minnesota to develop a hazelnut industry with focus on the hardy American hazelnut and cold hardy hybrids.

Their work includes breeding for hardiness and resistance to the EFB strains in their areas, as well as supporting the growth of the hazelnut industry. They have several trial sites testing plants from other breeders for hardiness and production. Their plots are the main test sites for cold hardiness for all the Grimo Nut Nursery selections.

This breeding program is still young, and they will not have releases for many years: it takes 17 years from the time the flowers are hand-pollinated until the best trees are named and formally released. This includes time for each tree to be evaluated, replications to be made of the best varieties, and for trials to occur.

The UMHDI has an incredible website with reports from all the industry building they have done over the years. Their marketing strategy has included local branding for the nuts roasted as savoury snacks, creating hazelnut oils for cooking, cosmetics and biofuel.



The UMHDI team showcasing practical equipment.

University of Saskatchewan

In Saskatoon in the 1940's, Les Ker bred hybrids of American hazel with European hazel. By the late 1980's the University of Saskatchewan took over Ker's work and introduced pollen from OSU to the breeding program.

These hybrids were not hardy enough and most died back each winter. However, the researchers continue to breed for hardiness and improved nut size through hybridization. The American hazelnut produces a very small nut, so crossing it with the European hazel increases the possibility of producing a hardy tree with a larger nut.

Without funding, this program has limitations, but its work will lead to some exceptionally hardy hazelnuts with great promise for northern Ontario growers.

Grimo Nut Nursery

My father, Ernie Grimo, began planting EFB resistant hazels in his Niagara-on-the-Lake orchard in the early 1970's. He collected resistant trees from breeders throughout Canada and the United States including OSU, the Gellately Nut Farm in BC's Okanagan Valley, the Geneva Research Station, Cecil Farris from Michigan, and other small breeders.

The trees from the Geneva Research station included the gene of resistance named 'Rush.' Although the Geneva Research program was discontinued, the 'Rush' resistance continues to hold up against EFB in Ontario and the Eastern USA.

Grimo's earliest selections are from open pollinated crosses which include: 'Carmela',

'Matt', 'Alex', and more recently 'Edward'. For the hardier bred trees we used three different cold hardy parents from Saskatchewan and Manitoba. The early selections are still being trialed for hardiness and production. The offspring from the Manitoba Skinner hazel produced only one tree that yielded large nuts. This tree named 'Dermis', which produces heavy crops of large nuts, is expected to be hardy but ripens too late for most cold areas. Ernie considers 'Dermis' more suited for areas that have a longer growing season.

In 2017 we began a controlled cross breeding project using a combination of OSU's Gamma trees crossed with hardy selections.

To perform controlled crosses a tree must be covered to ensure no pollen can land on the flowers except for that selected for the cross. The chosen pollen is delicately applied onto the flowers when they are receptive.

The goal is to produce hardy, EFB resistant, bud mite resistant trees that produce flavourful, high yielding crops for Ontario growers.

Each year, 'Gamma' trees were cross pollinated with C. heterophylla, 'Northern Blais', 'Aldara', 'Slate', 'Dermis' and 'Alex'. The resulting offspring produced trees of 'Gamma' x C. heterophylla and C. heterophylla x

'Gamma' etc. The bred trees are being grown in 3 Ontario locations; Flesherton, Smithville and Niagara on the Lake.

The trees will be evaluated yearly, and by the third year they should be ready to be evaluated for nut size, quality, and resistance to EFB and bud mite. Over the years the best trees will be selected and replicated for trials, which will determine the best, most hardy trees for Ontario growers.

Collaboration

All the above groups work together to collaborate in meaningful ways to benefit hazelnut growing. Dr. Mehlenbacher and Dr. Molnar support each other and the other researchers with time and expertise. They eagerly share pollen from their best selections to assist other breeders.

Hazels have genetic incompatibilities based on their alleles. There are 31 hazel alleles, and each tree has two alleles. The alleles are numbered 1 through 31. Simply put, if 2 trees have a common allele the trees cannot cross pollinate. For example, 'Marion's' alleles are 14 and 27 and 'Andrew's' alleles are 25 and 27. Since they share the allele 27 the trees will not be able to pollinate each other. Dr Mehlenbacher determines the genetic alleles for all other breeders. Knowing the alleles for each new selection is important to ensure pollination occurs.

Both Oregon State University and Rutgers have all the Grimo selections in their germplasm orchards. Grimo is fortunate to have their hardy selections trialed in Minnesota, Wisconsin and Iowa through the UMHDI, as well as in 2 sites in Quebec. Grimo in turn trials all selections in their Niagara on the Lake orchard.

Ontario Research Initiatives

In Ontario, Jenny Liu of OMAFRA has started to evaluate all the cultivars grown commercially in Ontario for both in-shell and kernel markets. She has begun to test different approaches to aid in pollination for young orchards using water as a delivery method. Some growers suggest fantastic results that warranted reliable testing and evaluation.

Martin Hodgson of Cortland Ontario made EFB resistant selections for Ontario growers from his 5000-tree seedling orchard. Hodgson's Norfolk C16 and Chelsea C28 are planted in other orchards as outstanding pollinators.

Hodgson has also participated in irrigation trials for hazelnut orchards. It has always been understood that irrigation is good for tree crops, but more recently trials in Oregon and in Ontario are showing tremendous benefits for the overall health of the tree, but also for higher quality nuts from irrigated orchards.

Phenology, the learning of the plant's flowering cycle, is another aspect of pollination that is critical for hazels. Each hazel cultivar has a specific pattern for shedding pollen and female flower receptivity. The nearby hazel plants must be in sync for the trees to cross pollinate. If the pollen of one tree is not shedding when the other tree's flower is receptive they will not produce nuts, even if their alleles are compatible.

I track the phenology of all the hazel cultivars at the Grimo farm in Niagara-on-the-Lake to understand the flowering patterns in Ontario and the results are compared with others tracking phenology in other areas. In Oregon, the plants flower for 3 months but in Ontario locations it is reduced to 3-6 weeks due to our climate. To ensure trees can cross pollinate it is essential to know the timing of flowering in Ontario.

Research within the hazelnut industry in Canada and the USA is a collaborative effort. The breeders working to create hardy hybrid hazels will have a significant impact on our ability to grow hazelnuts in colder Ontario climates in the future. The current research and breeding programs are leading the way to sustainable agriculture in areas where climate currently limits agricultural prosperity. ■



Ernie Grimo with bred trees paired in a tent.

Linda Grimo enjoys her work breeding both hazels and heartnuts to improve the cultivars for Ontario growers. She and her father, Ernie Grimo own and operate Grimo Nut Nursery in Niagara-on-the-Lake. Linda is the President of the Society of Ontario Nut Growers and is a director on the board of the Ontario Hazelnut Association.

Join Linda Grimo of Grimo Nut Nursery and Martin Hodgson of the Ontario Hazelnut Association for a session on Growing Hazelnuts and Other Edible Tree Crops at the EFAO Conference! Register at conference.efao.ca.



Ecosystem Restoration on the Farm, Part 1

by Julia Sutton

As farmers and stewards of the land, there are many reasons why it's important for us to think about how we can incorporate a little restoration into our overall farm plans. I was first introduced to the idea of restoration during university and a volunteer placement in Ecuador which inspired me to work in the restoration field, in both plant and aquatic ecosystems. I love the idea of restoration because it doesn't limit us to just conserving natural areas; instead, it gives us an opportunity to add to conservation, working with degraded lands and making them more ecologically diverse and resilient.

With climate change and increasing habitat loss, much of our wildlife is being challenged, just as we are. Many species that have more specific needs are not predicted to do well as climate change escalates. By increasing habitat diversity, we are helping to support those species that have specific needs in the hopes that we can keep them alive.

Scientists are predicting that in as little as three decades, we could experience a possible extinction of 40% of our insect population worldwide, including Lepidoptera species, which are our butterflies and moths. Not only would this have a huge effect on biodiversity and pollination, but it would also result in a huge loss of other important ecosystem services and put even further pressure on food sources for birds, bats and other mammals. The main two causes of this expected crash is habitat loss due to intensive agriculture and urbanisation and the use of synthetic pesticides and fertilizers.

When approaching restoration, there are many questions to ask. A good way to start is to think about your farm over the long-term. Do you have plans for



A shoreline where the cottage owners mowed right to the lake. There is very little habitat here for species needing the shoreline for nesting, cover or food.

future expansion, trails, buildings, etc.? Those would be areas to avoid doing restoration on, even though you may not be using the area currently. Do you have areas that you don't do any operation on that you could restore? Are there areas you are using that you could incorporate some restoration into? Are we looking to restore the land for a specific species or are we looking to create habitat for a greater diversity of species? Or can we do both?

Another important consideration and really the key question is what will we restore to? Do we want to try and restore parts of our land to what it looked like before Europeans arrived? Is that even possible? Or are you interested in restoring an area to a specific type of ecosystem, such as an oak savanna, a tall grass prairie or a native pollinator meadow?

Europeans have altered our ecosystems to such an extent that it can be challenging to restore to what the land looked like originally, and we need to decide if we want to remove all introduced species or keep our restoration more simple. Before starting any restoration project, it's important to identify if you have any invasive species on your farm, including introduced ornamental species, such as goutweed or periwinkle/myrtle. Any of these species would need to be removed prior to doing any type of restoration. It can be helpful to have someone with good knowledge of native plants to visit the area you are looking to restore, in order to identify what species you have. I always like to see what native plant communities already exist, as those are the plant species that will do well there and would have likely been a part of that ecosystem for many years. Here are a few different

ways to approach restoration that might make sense on your own farm.

Immediate & passive

If we lack the time and resources to completely restore an area, what are our options? In this case, I think about diversity. How can I make my farm more diverse and resilient to climate change? How can I provide habitat to the creatures that live in our region or migrate to our region for the summer months? How can we improve insect habitat? The easiest thing to do in this case is to stop any maintenance, including letting any leaves, twigs and branches stay on the ground.

As soon as you stop mowing, that area will start to transform. With this type of restoration, you'd likely start with a mix of introduced species and native species. But as years pass, more native plants will start to appear, without doing any planting at all, and that area will slowly succeed. And the more it succeeds, the more native plants will take over the introduced species, as they slowly start to shade out the introduced species. Some might argue this isn't true restoration, but as soon as an area becomes unmaintained, it automatically provides much better habitat for a diverse group of insects, birds and mammals and starts to provide important ecological services that tidy and mowed places cannot. This type of restoration takes longer but doesn't require any effort on your part.

Medium-term, some resources required

There are ways you can mix passive and active restoration and design it to the conditions you have. In my consulting work, I use mainly these methods, as it's often not possible to do a complete site restoration. In these instances, you can do passive restoration (no maintenance) but also intentionally plant species to increase plant diversity and support a greater variety of wildlife. This can be done in a number of ways.



The same shoreline, without mowing, one year later, with many native sedges taking over. Full sun and high soil moisture helps this site to fill in more quickly than a shaded or drier site.

Random/Natural

This type of planting is random, where you spread the plants out that you're planting. You'll want to remove existing vegetation only from the immediate area where you're planting them to help them get established. Coir mats can be quite helpful in this instance. This type of restoration makes it look more natural, as if the plants grew there themselves.

The Island Approach

The island approach works well if you have a large area that you want to plant but lack the resources (time and finances) to do a more intensive planting of the area. With the island approach, you intentionally plant in small islands, with the idea that over time, these islands spread out on their own and eventually cover the area in what you've planted. You can do this with wildflowers, shrubs or trees, or you can also combine them, as long as the wildflowers you plant can handle more shade as the shrubs and trees grow. For this approach, you'll want to remove the existing vegetation in and around where you plant your island. It would be helpful to trim the area around them for a few years until they are well established and can handle more plant competition. These islands not only work as effective windbreaks, but they also provide important habitat for birds and mammals.

Pit and Mound

If your farm is very flat, and you'd like to create a greater diversity of plant habitats, you can dig small pits and leave the mounds beside them. In the pits, you'd plant species that prefer moist to wet soils, and on top of the mounds, species that can handle drier soils. The pits can be small to large, depending on what size of an area you have to work with and how much time and effort you'd like to put in. This is a simple and fun way to add in more native plants and create different types of habitat for wildlife.

Improve Edge Habitat

Shorelines are referred to as the "ribbon of life" because they support such a diverse number of species. But edges between forest and fields are also very diverse and are important for a large number of bird and insect species. You can create more edge habitat by creating islands, hedgerows or other patchy types of plantings. These environments tend to be partly shaded to full sun, and you can plant a greater diversity of shrubs along existing edges that give a big boost for birds and wildlife, such as nannyberry, smooth rose, ninebark, dogwoods, sumac, hawthorn, chokecherry and elderberry.

Long-term & resource intensive

To fully restore an area of land to what it used to look like or to a specific ecosystem is a long-term project, where you have time and resources to dedicate to the project for multiple years. You will need a long-term vision and restoration plan. For these types of projects, existing organizations and community members with that kind of plant knowledge can be very helpful with planning and plant selection. In order to do a complete restoration, you will need to kill the existing vegetation in order to completely replace the plant community. For this, you may need to use silage tarps and/or prescribed burns. Once the area has been seeded or planted, it will need ongoing maintenance to keep other plants from growing and taking over. This will involve hand weeding, or in the case of a tallgrass prairie or oak savannah, doing cyclical prescribed burns to keep out other vegetation. If you want to try this kind of restoration, you can always try it out in a small area to keep it manageable while you learn. Even complete restoration can start out very small, and you can increase the size of it as you feel you have the time and resources to expand. ■

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In Part 2 of this article in the next issue of Ecological Farming in Ontario, Julia will share some specific and practical ways to build ecological integrity on the land.

.....

Julia Sutton lives on the traditional lands of the Anishinabek and Mississauga Nations, where she operates Santosha Farm, a 1.5 acre market garden, and does restoration work through her consulting business. She and her partner Rob run Missing Link Adventure Tours on the farm, a new retreat centre focused on cycling retreats, winter recreation and farm to table meals.



BEFORE – A planting opportunity on a partially shaded shoreline, degraded by soil compaction and human activity



AFTER – Post planting, one year later. The native plants were planted randomly and are doing well. A mix of wildflowers, ferns and shrubs help it look more natural. Other species are starting to grow up from the lack of human activity and the addition of compost that helped improve soil tilth and moisture retention.

We grow and supply certified organic vegetable, herb, and flower seeds with a focus on open-pollinated heirlooms and regionally-adapted, farm-selected heirlooms of the future.



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Farming Game Changers

After last year's EFAO Conference Regional Gatherings, one of the most clear points of feedback that we received was that sessions about farming game changers where you heard from several farmers in succession were a big hit! You loved learning about a lot of ways to improve upon your farming operations, all at once. We've included Game Changers in the conference program again in 2023. Here's a preview of the kinds of stories you'll hear from a few of the speakers that are on the docket this year.

Greenhouse Automation

Since automating our 4 greenhouses I save at least an hour per day, that was spent managing irrigation, roll-up sides or furnaces. Over the course of a 7 month growing season, that amounts to 210 hours saved or 5.25 40 hour weeks. Not only does it save me time, it does a better job of managing both the growing environment and irrigation, meaning we have a more productive growing space and a better ROI. Additionally, it frees us up to focus on other more creative things. It also allows extended vacations and leaving the farm in the morning and evening when we previously had to be there to manage environmental changes like raising or lowering roll-up sides to prevent overheating or freezing crops. I wish we had done this years ago.

Scott Sigurdson, Indian Creek Orchard Gardens

Access to Information

For me the biggest game changer during the time I have farmed has been the access to online resources. This is no longer only a local solution (previously accessible only in print), but you now have access to an array of information on all crops from around the World. With technology literally at your fingertips, it has become so easy to look up a chemical label, a seed rate chart, settings for machinery etc online whilst in the field. This has been a huge time saver in our complex agriculture



Brendan from Sleepy G shows off his storage facility

system. You simply cannot remember everything and having easy access has made all the difference.

Norm Lamothe, Woodleigh Farms

Winter Vegetable Storage Facility

In 2019 we built a 1500 sq ft facility to keep storage vegetables through the winter. The building is constructed

of ICF (Insulated Concrete Forms) and spray foam roof structure. The cellar keeps product at a steady 1 C even when it drops to - 30 C outside! The cellar enabled us to dramatically increase our winter CSA program and stop going to the farmers market. Giving up the weekly hustle of a farmers market was mainly a quality-of-life decision that has resulted in better work/life balance.

This became especially important to us when we had a child.

Having reliable on-farm storage has led to increased revenue through wholesale accounts. Ultimately it provides steady cash flow throughout the whole year, as well as year-round employment for our permanent staff members. Even in Northwestern Ontario where our growing season is a month shorter than the southern part of the province we are able to sell vegetables 10 months of the year. Our winter cellar, or “veggie vault”, is hands-down the best piece of infrastructure we have on the farm.

Brendan Grant, Sleepy G Farm

Having Both Farm Managers on the Farm Full-Time

At Black Sheep Farm, the game changer was when Skyler stopped working off farm, and took over being the primary farmer for the sheep flock.

It was 2018, I (Brenda) was growing CSA vegetables in the 1-acre CSA market garden, our daughter Emma was 1, and the sheep flock went from 14 to 36 at spring lambing, with another 10 lambs born in the fall. Between childcare and flock care, Skyler was needed on the farm, and luckily, he took happily to being a shepherd. Some adjustments have been made over the years, but both Skyler and I are on farm full-time, the equivalent of about 1.5 full-time farm workers (I just started working part-time for Farmers for Climate Solutions from home and no longer market garden). Sharing farm tasks between us, and having a back up at all times, means there's some room in our farming to actually enjoy the work and not just be stressed. We definitely bicker about how to do many things, but we try to give each other space to each do things our own way. Farming in partnership, without the stress of commuting to off-farm work, is a privilege which we don't take for granted. We may not get to go

on vacations, but we eat very well and still love farming.

Brenda Hsueh, Black Sheep Farms

Compost Drop Spreader

We have over 2 kilometres of 30” raised beds upon which we grow vegetables. Each year we import 8 truckloads of compost (176 m3) that needs to be spread on those beds. Previously we spread the compost using sweat, shovels and wheelbarrows. A number of years ago I designed and built a compost drop spreader, especially for 30” raised beds. It can cover a 200’ bed in one pass. Now spreading compost is an easy two days of tractor work rather than two hard weeks of hard labour.

Scott Sigurdson, Indian Creek Orchard Gardens



Beyond grateful for the good folks at Orisha for amazing customer service and **allowing me to hold the fort down while getting off the farm.**

Jaymie - Rutabaga Ranch



We were worried about investing in Orisha in the first year, but on a farm without much staff **it's almost necessary.**

Karl Hoppner - 1818 Farm Insider

Break free of your greenhouse grip



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Ideal Greenhouse Conditions? There's an App for That

By Guillaume Lambert

While each farmer has their own unique challenges, many struggle with the same questions: How to increase yields? Protect crops from disease? Keep up with skyrocketing costs? Greenhouses are a key part of the solution, but the time required to manage them is constantly increasing – as is the stress on farmers.



Fortunately, there's an app for that. Our passionate young team at Orisha works with farmers and agronomists to blend time-tested farming techniques with intuitive green technology. Using a mobile phone app and onsite sensors, Orisha fully automates the remote monitoring and control of greenhouse temperatures, humidity and irrigation, all for less than the cost of most monthly cellphone plans.

Today, Orisha helps nearly 200 farmers and their crops thrive by equipping them to control their greenhouse from their smartphones. Many of them have seen their annual yields increase three fold.

As a small business committed to growing a more sustainable world, we're incredibly grateful to our community of farmers for their help in getting the word out about Orisha. Here's a story from one of them.

"We have more freedom, healthier vegetables, less disease ... and we can stretch our seasons by two to three weeks."

– Jean-Michel, Gauoise Farm



Jean-Michel Guertin and his family have a small 1/3-hectare market garden in central Quebec where they grow about forty organic vegetables for CSA boxes each season. When we first met them, the family had two greenhouses, and managing them was increasingly stressful.

"We constantly had to leave the field or other priority tasks to manually control the greenhouses," said Jean-Michel. "The mental load was a heavy burden, like the constant fear of forgetting to open or close the panels. If you're not there when the wind picks up, or forget to adjust the panels when the temperature changes, it can have significant consequences on the yield and quality of the vegetables."

Since they started using Orisha, Jean-Michel and his family have been able to add a third greenhouse without hiring additional staff. They continue to be a key part of our thriving community, for which we are deeply grateful – we hope you might think about joining it too. ■



Guillaume Lambert is a co-founder of Orisha. He lives and works in Quebec City, but spends much of his time at local farms across the province and beyond.

EFAO members are eligible for an exclusive 10% discount on the Orisha app system! To learn more, email us at info@orisha.io or give us a call at 1-888-267-4742.

No-Till Intensive Vegetable Culture by Bryan O'Hara

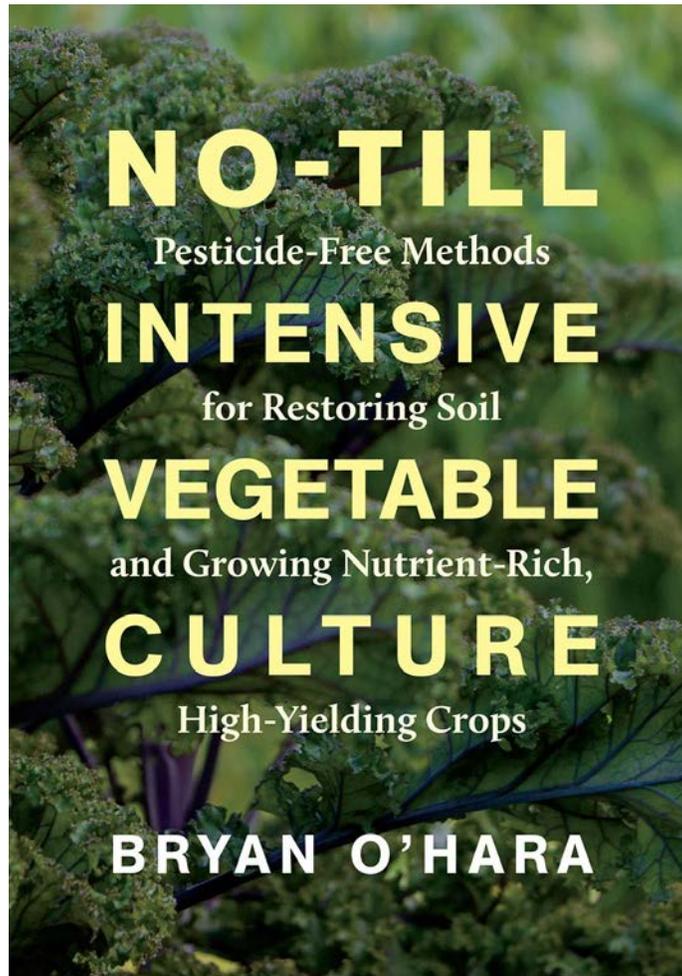
by Jason Hayes

Reasons why it seems to me that Bryan O'Hara has much to teach us, even though he farms in another climate entirely:

His book, *No-Till Intensive Vegetable Culture*, details his vegetable growing practices, derived from a set of influences as seemingly disparate as Biodynamics, Korean Natural Farming, and western agronomy a la Albrecht, Kinsey, et. al, and shows how these are woven together to nurture a healthy farm into being. He places a strong emphasis upon observation of nature, both in and around the farm, and the importance of this practice in guiding the grower's many decisions.

It is sometimes difficult to assess the potential for immediately applicable, transferrable knowledge sharing in an author or conference speaker from a far off land, whose vegetables you've never seen, much less eaten. Among the items that have my attention from Mr O'Hara are:

- 1) Broadcast seeding of vegetables. This means no hoeing after emergence, people. It means his weed pressure is negligible, his germination timely. It means he's not spending time fussing with seed drills. Or spending money to own them.
- 2) Little reliance on row cover for pest control. This means he's raising



crops that are healthy enough to not attract insect pests, including flea beetles.

- 3) His proficiency at crop steering, based on a fluency in 'seeing what he looks at', using farm made compost and other fertility materials. These and other elements of his story at Tobacco Road Farm tell me we have the chance to interact with a grower who has been successful at doing what we all strive to do: play our part in nature; who is producing top quality vegetables while

healing the ecosystem around him through his farm's soils and his neighbours' bellies.

A picture starts to emerge here of the bargain many of us started chasing, after seeing the Singing Frogs farmers some years ago, in which we swap time spent on tillage, weeding and applying row cover for time spent establishing soil preconditions for healthy crops. *No-Till Intensive Vegetable Culture* is a well balanced manual for growers at all experience levels. I gobbled it up when it came out three years ago. Let's see what Bryan has been up to since then. ■

Jason Hayes farms at Burdock Grove Farm in Williamsford, Grey County. He raises vegetables, chicken, pork, and duck, and makes various prepared foods from them.

Don't miss out on learning directly from the author of *No-Till Intensive Vegetable Culture* at the EFAO Conference! Bryan O'Hara will be presenting three sessions on his methods. See the program and register at conference.efao.ca.

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