Ecological Farming in Ontario

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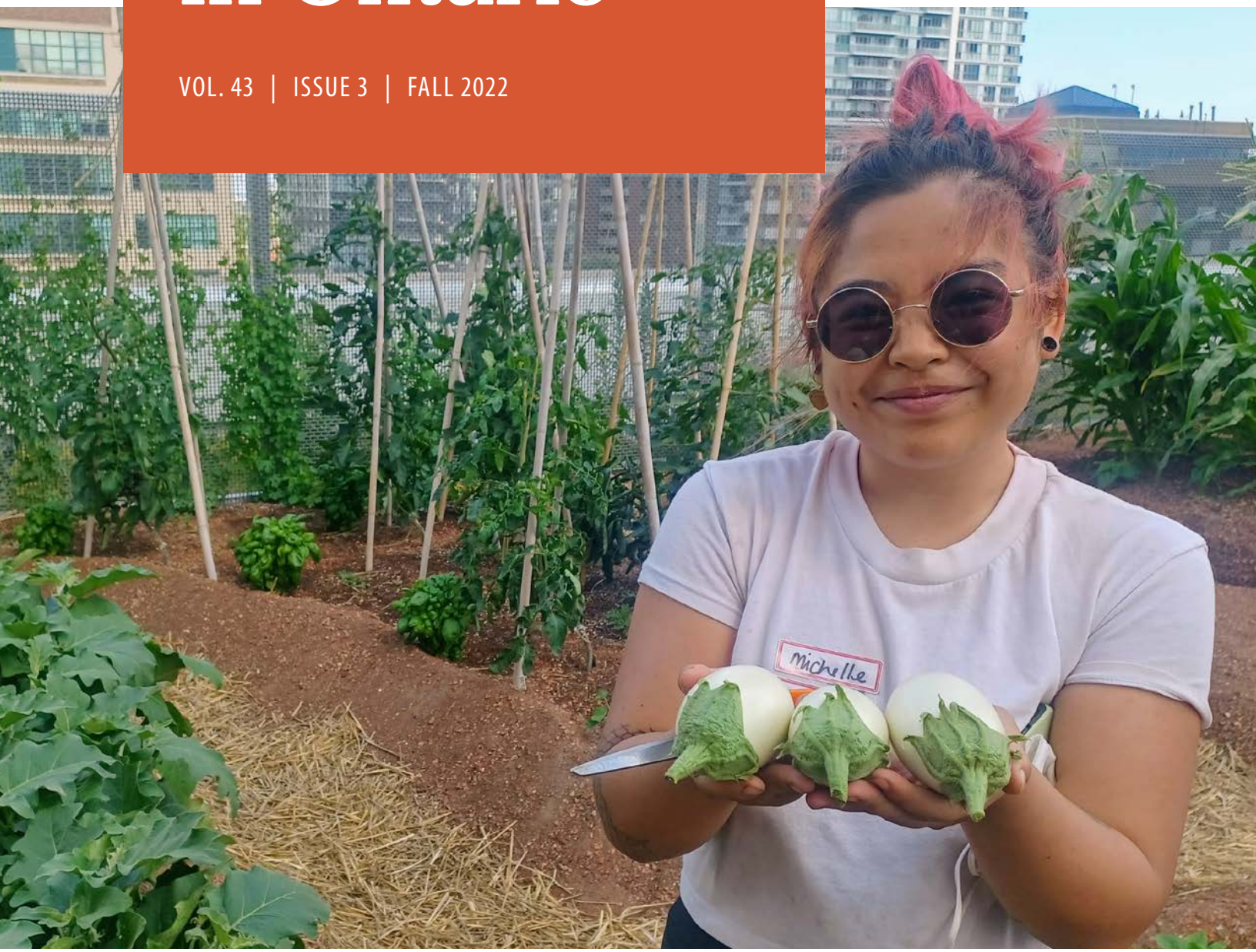
EFAO
ECOLOGICAL FARMERS ASSOCIATION OF ONTARIO



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On the cover
Michelle Dang, a member of EFAO's BIPOC Farmers Network who is working at Toronto Metropolitan University green roof, shows off some beautiful, freshly harvested "Garden Eggs" (African white eggplants). Michelle helped host EFAO's field day at the roof top farm on July 21.

EFAO
ECOLOGICAL FARMERS ASSOCIATION OF ONTARIO

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.

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Deadline for Winter 2022 issue: Oct.15, 2022.

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

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A Message From the Board President

As most of you probably know, EFAO has been a key player in the work of Farmers for Climate Solutions (FCS). EFAO's work with FCS has helped us achieve our strategic goal of advocating for policies and programs that support and spread ecological agriculture.

Farmers for Climate Solutions has been surprisingly successful in the short time it has been in existence. Our advocacy efforts have led very directly to over a billion dollars in new federal spending commitments to incentivize climate-friendly farming practices. **We have helped bring climate change to the centre of the agricultural policy debate.** And we have brought together progressive farming organizations from across the country — organizations that have often felt isolated and ignored by governments and larger farm groups — and given them a powerful voice.

There is much to celebrate about FCS's success and EFAO's role in that success, but the recently announced Sustainable Canadian Agricultural Partnership (SCAP) shows that there is still a great deal to be done. Most public spending in Canadian agriculture is carried out under agricultural policy frameworks: five-year agreements between the federal, provincial and territorial governments. The next framework will be launched in March of next year. Federal, provincial and territorial ministers of agriculture met in late July to hammer out an agreement. The SCAP was the result of those efforts.

Farmers for Climate Solutions worked for months to build evidence and support for a policy framework that would include ambitious GHG emissions reduction targets and substantial spending to help farmers mitigate and adapt to climate change. We worked with top scientists, policy experts, and committed farmers from across the country to create science-based, farmer-centric recommendations. FCS recruited and trained a network of farmer ambassadors to meet with government leaders and speak to the media. FCS member organizations lobbied provincial governments and met with ministers of agriculture. EFAO farmers, staff, and board members were central to all of these efforts.

When SCAP was announced in July, there were a number of positive outcomes, but we didn't get the climate-focused policy framework that we worked so hard to achieve. There is some new spending for climate action, including $250 million for a Resilient Agricultural Landscapes Program, and a renewed commitment to a 30% reduction in emissions from nitrogen fertilizer, but FCS's recommendations for systemic change went unheeded. The SCAP targets a three to five megaton reduction in GHG emissions from agriculture in the next five years — about a third of what FCS thinks is achievable.

Who do we blame for this failure? The federal government sincerely pushed for greater climate ambition in the policy framework. Provincial governments, including Ontario's, were at the bargaining table and blocked the kinds of policies FCS has recommended, but the root of the opposition to climate action in the SCAP came from farmers and the organizations that represent them. Farm groups across the country were united in their opposition to any link between business risk management programs (the biggest area of spending in the framework) and climate or environmental goals. Farmers have been withering in their attacks on the government's 30% nitrogen emissions reduction target. The message from mainstream farm organizations was clear: climate change is not the top priority.

In the short term, EFAO and FCS must work to ensure that the positive aspects of the new SCAP actually translate into effective programs on the ground, and we must look for ways to increase the climate ambition of all levels of government through mechanisms outside the agricultural policy framework. But we must also think about how we can recruit more farmers to our cause, and how we can help larger farm organizations to see climate change as the existential threat it really is. **Changing policy will require changing attitudes and culture, and that's a long-term task.**

Sincerely,

Brent Preston, Board President

Save the Date: EFAO Conference 2022

New Hybrid Format!

For this year's Conference, we're introducing a brand new format designed to reduce travel, increase your ability to connect with other farmers in your region, and maximize accessibility of learning for all. In 2022, the EFAO Conference will consist of three regional gatherings that are focused on socializing with fellow farmers and facilitating in-person experiences, as well as an Online Program that will emphasize education and accessibility.

These changes were based directly on feedback from attendees of our 2021 Virtual Conference. We hope that the new format will meet the needs of the majority of our members, while still offering access to the knowledge sharing and community building opportunities that the EFAO Conference is known for.

More details will be shared throughout the late summer and early fall. Until then, mark the following venues and dates in your calendars for the four components of the conference:

EFAO Conference 2022: Eastern Regional Gathering
Nov. 19, the Batawa Ski Hill Chalet, Batawa (12 minutes north of Trenton)

EFAO Conference 2022: Southwestern Regional Gathering
Nov. 12, Earth to Table Farm, Waterdown

EFAO Conference 2022: Northeastern Regional Gathering
Nov. 26 & 27, Northern Water Sports Centre, Sudbury

EFAO Conference 2022: Online Program
Dec. 6, 7, & 8

Upcoming Fall Field Days

If you haven't made it out to an EFAO field day this year, it's not too late! Be sure to check efao.ca/events for full details, and to learn about more field days as they get added to the schedule.

From Veggie CSA to Pastured Sheep: Farming for the Long Haul*
August 27, Black Sheep Farm, Chesley

Living-Lab Ontario: No-till Potatoes*
August 29, Orchard Hill Farm, St. Thomas

Holistic Management Planned Grazing*
September 11, Meeting Place Organic Farm, Lucknow

Carrot Variety Trial & Tasting Event
September 22, University of Toronto Scarborough

Ecological Health Through Pasture Management*
September 26, VG Meats, Cayuga

**These field days are OSCIA-recognized On-Farm Climate Action Fund (OFCAF) Knowledge Sharing Events for applicants with approved projects in particular funding areas. Check efao.ca/events for more information. Questions about OFCAF should be directed to OFCAF@ontariosoilcrop.org*

Back to Their Roots: A Conversation with Arlene, Judith, Cady & Alvis

For this member profile, EFAO spoke with four farmers leading three unique farming and land stewardship operations in Ontario to find out how their personal histories, philosophies, and experiences have influenced their approaches to farming.

UBUNTU Community Collective

Wawakapewin, Oji-Cree First Nation reserve

The Farmers and Land Stewards

How does farming reconnect you with your roots? Who or what has been your biggest inspiration?

CADY: My great grandfather is my greatest role model. He managed at least two acres of land on his own and was able to feed my family every day. There was no need to go to the grocery store except to get imported goods like flour. I've also learned of other family members who also were farmers. The more I learn, the more I feel as though life has nudged me into farming.

ALVIS: Elliot Coleman. The way he championed education for small scale farms on a profitable market garden was encouraging for me. It inspired me and helped me see how making a living farming on a small scale could be possible. He showed the methods, recommended tools, and gave reasons which were all helpful for me on my journey to starting my own farm. His book really lit the fire inside me.

JUDITH: My Mom 100%. Where I grew up in Toronto we had a big backyard where my mom grew and preserved strawberries, pears, raspberries, corn, beans, greens, all the staple vegetables — it was basically a rural Jamaican lifestyle in the middle of the city. As I got older though, my 1970's single mom got so busy working multiple jobs, she stopped gardening. It wasn't until I went back to Jamaica in my 20s that I learned how growing food runs in my family, connecting with aunts and uncles whose backyard farms felt very familiar. But farming as a job was discouraged, there was a sense of shame associated with it. My family was all about education — lawyer, doctor, engineer, etc. was encouraged. I trained as a chemist. Living and travelling in southern Africa, Tanzania, and West Africa later helped to strengthen my farming goals.

What does it mean to decolonize foodways and farming?

ARLENE: It's about stepping back into our own Indigenous heritage so that we can benefit from the huge variety of traditional uses of plants and other foods. We have internalized so many colonial ideas. Current pressures and

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Judith "Zhiizhii" Prince

Ubuntu Community Farm

- 0.5 acre organic regenerative market garden farm on leased land in Downsview Park, Toronto (in partnership with Fresh City Farms)
- Growing: a wide variety of leafy greens, fruiting veg, and herbs to learn what will thrive in this clay soil.
- My farming philosophy: The energy and love you give to the soil and plants equals the abundance you get in return and it's shocking how abundant the earth really is for us. Scarcity is an illusion.

Judith with Ubuntu's early summer harvest

Ubuntu Community Farm

Farmer Judith at the UCF farmers' market stand

Arlene Meekis-Jung

Wawakapewin, Oji-Cree First Nation reserve

- Market garden community farm in a remote Northern community (Kenora District) with only float plane access, 350 km north of Sioux Lookout. Freight charges start at $6.50 / lb to fly in groceries.
- Growing: staple crops (potatoes, carrots, leafy greens, etc) in a series of 10' x 100' raised beds and mounds. This helps reduce household spending on produce by upwards of $13,000 per season.
- My farming philosophy: Don't be afraid of failure. Great things happen when you try something new.

Arlene Meekis-Jung

Wawakapewin tomatoes in November

Wawakapewin season extension for tomatoes

Cady and Alvis

Deeper Roots Farm

- 0.5 acre seasonal farm on leased land in Brampton, growing foods of the African Diaspora: okra, callaloo, bitter melon, poi, sorrel, and other beloved cultural staples
- Top three crops to grow: We both choose callaloo and Swiss chard. Cady: And Jamaican pumpkin. Alvis: watermelon.
- Our farming philosophy: Stay rooted. Give thanks for the harvest.

Beet harvesting, Deeper Roots Farm

Cady, Deeper Roots Farm

Alvis checking on the callaloo, Deeper Roots Farm

Alvis's inspiration

disruptions of traditional foodways, it's a new strain of colonialism. We need to help people come out of those toxic ideas, so we can remember what our lives were like before, how we farmed or foraged and hunted, what we ate. Traditional meat is an important part of my community's diet – we have moose, fish, caribou, and make many different types of jams, jellies, syrups and traditional medicines like rosehips.

One of the elders I most respected, he didn't like the idea of saying "food sovereignty." He preferred terms like "food justice" or "food equality" just because "sovereign" reminded him of broken promises from the Crown. In conversation about these things, we could say "we're going to talk about 'food sovereignty,' however based on input from Indigenous peoples and their elders, they prefer the term food justice." It's very important to acknowledge that when we're speaking about food and farming, we're actually speaking about equality, access, justice, all of those things — but that doesn't always look the same for everybody. I feel this could really help people to look at the different ways people understand these terms, related with farming, food and community.

CADY & ALVIS: A good way to fight the power is to support local farmers. Support your local food systems and lessen your dependence on oppressive food systems that create poverty; there is abundance in the earth for us all. Purchase a harvest share from Deeper Roots Farm if you're into raw food, organic food, local food; pesticide-free, synthetic fertilizer-free, hate-free; black family-owned, community focussed, culturally sensitive foods — we got you. Support and join us on our journey towards farm land ownership/stewardship in Ontario.

How have your elders and ancestors influenced your farming and land stewardship choices?

JUDITH: As a mother of four and for the mothers in my community, food is a big issue. We're always cooking, feeding, our lives revolve around food. We want to make sure our children are getting healthy, affordable food. A big motivation for farming is to have more control over what we can offer our children and the security of knowing where food is coming from. We're also sharing and cultivating knowledge about other uses of plants, for medicine and healing. Farming collectively also sparks memory: "Oh, my mother did this," or "My grandmother did this!" Ancestral knowledge grounds you in the knowledge "I can do this, I can provide for my family and community." Working this way, you can give your problems to the earth and the earth gives you energy back, feeds you and gives you strength to deal with all the challenges and conundrums of farming and life.

ARLENE: That is how Indigenous people feel about the land as well. Even science now recognizes that working with the land and soil gives healing and benefits. As Indigenous people in my region we would not have said "farming" exactly, but we foraged and collected things and ensured that the plants in that area would be viable for the following seasons. Stewardship is a type of long term farming. We need to look at farming in a new way. There is a co-op in my area that pays youth to collect wild blueberries, then sells them in Thunder Bay and other regional places. The youth absolutely love getting out on the land, they are paid and also enjoy delicious fruit while they work. This needs to be replicated in more communities, also as a way to care for the land. I remember going out with my great grandma doing similar tasks and loving it. My great grandmother was 106 when she passed away in 1997. I was able to know what it was like in the late 1800s before any non-Indigenous person came to our area.

What farming setbacks have turned out to be opportunities?

ALVIS: Clay soil. It may be difficult to work with but it stores a lot of nutrients and water. We find that we don't have to water so much in the summer compared to [those with] a sandy soil composition.

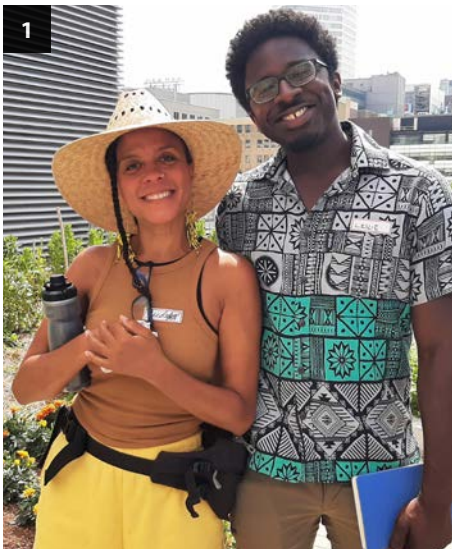
CADY: I agree. We recently expanded to a new plot with sandy loamy soil. The soil on this new plot is beautiful, however we can see the differences between them. Water retention is one of them. Our carrots for instance, which we treat fairly similarly between the plots, are germinating much better in our clay soil, likely due to the moisture.

JUDITH: My whole dream of being a farmer in Africa and living off the land couldn't take root in Tanzania where I felt very connected to the land but the connection to the people was not as strong — I was always considered an outsider. It was only after coming back to Toronto in 2015, where I was born and raised, could my farm plans come to fruition in my community. It came together in the right time and place with purpose and intention. The next goal is for us to earn enough from farm sales to keep the business afloat and to support our non-profit organization, Ubuntu Community Collective.

What does growing cultural staples mean to you?

CADY & ALVIS: We've decided to focus on growing cultural staples because that is what our direct community is most interested in; they're culturally significant for us as well. Sorrel or hibiscus is dried and typically available in the fall to be used during Christmas as a drink. Often it is paired with rum. It represents a joyous time of the year spent with family and loved ones. Okra and callaloo are staple dinner ingredients — they're a reminder of home and make a warm, hearty meal. This is the cultural significance that these foods carry for us and our motivation to grow it. We think it is great and important to have a local and organic option to access these culturally important foods. ■

PHOTO HIGHLIGHTS



2022 Summer Field Days

1. Urban Farm staff farmer Nicole Austin (L) welcomes Leslie Campbell (R), member of the BIPOC Farmers Network, at EFAO's green roof field day, July 21, at Toronto Metropolitan University's rooftop farm sites.

2. The first in-person meetup of EFAO's BIPOC Farmers Network since 2020! Joined by other EFAO members, it was a beautiful and educational field day at both TMU rooftop farm sites, and included info about the Black Food Sovereignty Initiative, the Indigenous Foodways programs as well as EFAO's Farmer-Led Research program.

3. Chris Wooding of Ironwood Organics talks about the different types of equipment he uses for different scales of grain production on a field day at his farm, Ironwood Organics, in Athens, Ontario, July 26.

4. Jennifer Osborn of All Sorts Acres discusses living fences, silvopasture, and the diversity of products and practices produced and employed on her farm, at a July 11 field day. A big thanks to Val Steinmann for hosting the day due to an EFAO staff illness! Photo credit: Jessica Robertson.

5. Haskap Production at La Belle Vie Farm, July 12, 2022.

6. At a July 12 field day at Woodleigh Farms, Norm Lamothe tells EFAO members about striving for regenerative production of barley, oats, and wheat.

7. At the Living Lab - Ontario: No-Till Garlic field day on July 6, Ken Laing described his no-till techniques and showed off the medium-scale machinery he uses to a good-sized crowd.

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Living Lab – Ontario: Woody Van Arkel Tries Perennial Cover Crops

by Jackie Clark

In modern farming, no matter the scale, farmers are much more than just food-growers. To run a market garden with a CSA or a large-scale field cropping operation, farmers have to become experts in skills such as business planning, marketing, mechanical operation and equipment repairs.

One such skill set that almost all farmers take on is that of researcher. Producers are constantly asking questions, innovating, experimenting, collecting observations and data, changing variables, and studying results.

Seeing the value in this skillset, and understanding that agricultural innovation is a cornerstone of healthy soil and water in the future, Agriculture and Agri-Food Canada (AAFC) introduced the Living Lab – Ontario initiative. Scientists, farmers, and agricultural and conservation organizations are working together across the Lake Erie basin to conduct research with the goal of reducing nutrient runoff into Lake Erie. The research aims to improve soil quality, water quality, watershed management, and biodiversity.

One of the six farmer-cooperators in Ontario is Woody Van Arkel. Woody grows corn, soybeans, wheat, and sugar beets just south of Dresden. He's no stranger to experimenting with reduced tillage and cover crops, and is a past president of the Innovative Farmers Association of Ontario (IFAO) and board member of the Ontario Soil Network (OSN). His Living Lab – Ontario project involves perennial cover crops.

EFAO staff reached Woody in the field.

"I'm sitting up on top of a combine, but that's fine," he laughed. We can add

multitasking for media interviews to the list of jobs farmers have.

"Perennial cover is an idea that's been floating in my head for a while. It's kind of the next step in incorporating cover crops," he explained.

Over the years he has conducted quick experiments that haven't worked out, and then in 2019 he started working with some larger plots. He strip-tilled a field of perennial cover crops, and planted corn without terminating the covers. Since then he's been working to improve the technique.

AAFC approached Woody through IFAO. "I had three years of experience before Living Labs started," he said. "So, I had a pretty good idea of how I wanted to go forward with Living Labs, a general sense I guess, but still very much a work in progress."

Woody had previously hosted a test site for cover crop research as part of University of Guelph graduate studies, which "gave me an idea of how academic research worked compared to how farmers think about research," he explained. He had an understanding of how experimental design and protocol may need to operate.

Working with researchers has "been pretty smooth," says Woody. "The important thing is that everyone's communicating about what's going on in the field."

His main collaborators are Dr. Eric Page and Dr. Lori Phillips, both AAFC research scientists.

When it comes to the practice of perennial cover, there are still a lot of challenges to overcome.

"Can we make it work? It depends on what day you talk to me," Woody says with a laugh.

He's been tweaking cover crop species, experimenting with band spraying, and modifying his mower to mow between corn rows. It's a balancing act to maintain perennial cover that will provide ecological benefit to the soil and system without growing too aggressively.

"The physical part of managing perennials, I think we kind of have that figured out as far as the mowing process," Woody says. "Species selection is still an ongoing challenge. Getting better results every year, but still need to sort some of that out."

The current Living Labs trial includes white clover and subterranean clover. When Woody first began investigating perennial cover, he used traditional cover crop species, like fescue grass and red clover, but found they grew too aggressively.

He's exploring lesser-used forages, looking for less competitive biomass to provide perennial cover without hogging resources like water, light and nutrients from the corn and reducing yield.

He continues to lean on his network of agricultural experts for new ideas. Christine O'Reilly, forage and grazier specialist with the Ontario Ministry of Agriculture, Food, and Rural Affairs recently suggested looking into turfgrass

species, which may provide a slower-growing and less competitive crop type.

Even outside of the structure of Living Lab – Ontario, Woody has done a lot of independent experimentation to test what might work.

The future of the project is "going to depend on how the next version of Living Lab – Ontario proceeds, and whether it includes this project or not," Woody explains. "If it does I'll carry on and keep [the practice] in the rotation so they can get some consistent soil measurements."

AAFC scientists have been collecting information on Woody's experiments, including data on nutrient cycling, carbon levels, organic matter, and insect counts.

"If my project discontinues as part of Living Labs, then I haven't 100% decided whether I'm going to keep that field as a project," he adds. "It's hard for me to do the soil measurements, and everything that's involved with that. If there's nobody measuring the benefit to the soil, to the environment, and I'm struggling to do as well as conventional farming systems, then I question whether I should carry on."

Woody hasn't made any final decisions yet, and the future of the Living Lab initiative is still unknown. For now, the prospect of perennial cover crops has caught the attention and curiosity of the broader agricultural and research community.

Woody hosted a field day on June 28th, with over 60 people in attendance. He estimates a quarter of the folks attending were farmers, a quarter were industry stakeholders, a quarter were OMAFRA and AAFC scientists and representatives. And the final quarter? Just folks that were interested in what the Living Labs project was all about.

Whether in this specific project in Ontario or in research institutions, governments and communities around the world, the role and perspective of the farmer is completely imperative to building healthy and resilient agricultural landscapes. ■

***Jackie Clark** is EFAO's Small Grains Program Manager, helping encourage farmers to realize the benefits of incorporating small grains in field crop rotations. She is also an accomplished writer and former journalist.*

Why Regionally Adapted Seed Matters

by Rebecca Ivanoff

Seeds For, and From, Ecological Farms

Seed is essential to the fabric of ecological agriculture and is embedded in the work we as a community of ecological growers are doing to create a better world. When thinking about why local, ecological, regionally-adapted seed matters, we must grapple with both systemic influences on seed, as well as the immensely personal relationships that are created when working with seed.

PPB wheat trials in Brandon, Manitoba, 2021. Photo by Tierra Stokes.

As farmers transition towards more climate-resilient ecological agriculture, we are going to need seeds that thrive in these conditions. Seeds have the amazing ability to adapt to changes in the environment through seed saving, selection, and other classical plant-breeding techniques. Growing organic and adapted seeds in our fields and gardens — seeds that have come from plants that have grown and thrived in similar soils and ecosystems — means that they will have the genetic information they need to flourish. This adaptation is key for a crop's survival—mitigating risks for the growers and the communities they feed, helping reduce the need for synthetic, fossil-fuel-derived inputs, and ultimately, making our farming systems more resilient.

In contrast, crops grown from seeds bred or adapted in farming systems that use fertilizer and other synthetic inputs are not as well-suited for ecological and organic management. Moreover, by purchasing seeds bred or grown using synthetic inputs, we are supporting the very farming systems that we are trying to build alternatives to within the ecological farming movement.

In preliminary trials, wheat populations that were selected by ecological growers in the Prairies as part of a participatory plant breeding (PPB) program with the University of Manitoba and The Bauta Family Initiative on Canadian Seed Security showed that farmer selections under organic conditions can outperform conventional varieties and often have traits desired by organic growers such as longer straw length, which is desirable due to straw's many uses on organic farms.

If these results are possible with PPB wheat, what might the possibilities be for other crops? Could farmers breed a watermelon that ripens early enough for northern Ontario market farmers?[1] What about high performing organic dry beans for Ontario's climate? There is no shortage of crop priorities for farmer-breeders to consider.

In order to produce local, regionally adapted crops, we need to have genetic diversity to select from. Globally, however, we've lost 75% of agricultural biodiversity in the last century. As growers, we may find that varieties we

1 This is being worked on by EFAO farmers near Thunder Bay with support from the Farmer-Led Research Program.

have loved and relied on may no longer be available for purchase or are not available organically.

As seed companies consolidate, they often drop varieties that do well in specific areas, in order to focus on those that perform uniformly across the country. Of course, farmers must have access to the seeds that meet their needs, and this can include hybrid seeds, especially in the organic sector where options are more limited. However, when an entire industry shifts its focus and resources away from open-pollinated varieties in favour of hybrids, there is an impact on biodiversity overall.

One of the consequences of consolidation in the seed industry, and the increased reliance on hybrids, is both a decrease in the number of open-pollinated varieties available, but also a loss of quality among these open-pollinated varieties. This often puts farmers in a hard place, where local organic growers feel they can't take a chance on poorly stewarded open-pollinated varieties. They may then turn to better cared-for hybrids that perform reliably, but do not offer the same opportunities for seed saving, regional adaptation, and seed sovereignty.

Thankfully, regional, organic seed companies and on-farm breeders are actively improving open-pollinated crops. By supporting regional seed companies, we can support the continued existence of varieties, help maintain biodiversity, and grow crops from seed that hasn't travelled great distances. These varieties will be more likely to thrive in our gardens, thus producing delicious tasting food.

Seed Relationships

When we plant a seed, we are connected to a multitude of relationships. We are connected to the soil, the plant that grows, and to the abundance of the crop. And we also build relationships with ancestors, with culture, and with future generations.

I have a distant memory of my Dedo, (grandfather in Bulgarian) whose pockets were always full of seeds (for the birds), showing me the seeds in the heads of mature sunflowers, and I remember my mum telling me not to put my fingers in my mouth after planting the peas with the bright pink powder on them. But I don't have many other childhood memories related to seed. When I started learning about seed saving much later in life, I grew seeds from my mentor Johann and from Seeds of Diversity. As I began talking to other seedkeepers, I became curious about what seeds my family had saved in the past. What varieties of peppers were grown? What type of peas? What shape of white bean was needed for making the bean dish we always ate called боб (a Bulgarian word pronounced "bop" in English). These questions led me to have conversations with various family members where I heard stories about culturally meaningful foods and plants that were specific to my family.

Bop made with white beans from Debelez. Photo by Rebecca Ivanoff.

Upon my request, my parents brought me back seed from family friends in Bulgaria, and my dad's cousin in Switzerland helped me translate their names. One bean only came with the description "white bean" and that it was from Debelez, Bulgaria. My Turkish-American friend, Mehmet[2] (whose grandfather and my grandfather were born in the same area of Bulgaria), shared that this bean looked like the variety Horoz, a common variety in western Turkey where many descendants of Bulgarian Turks live and that is used to make a dish called kuru fasulye (which looks similar to my bop!). This year, after a few years of growing and selecting the best of that variety, I'm growing a big patch of this bean so that I can share the harvest with Mehmet, as well as cook bean stew for friends and family. I find myself taking special care of these plants because of the relationships they represent — to the seed community I am a part of, my own heritage, and to the land where I now grow these seeds. As my colleague Solvieg Hanson, coordinator of the Canadian Organic Vegetable Improvement (CANOVI)

2 Mehmet Öztan and his wife Amy Thompson have a wonderful seed company in West Virginia called Two Seeds in a Pod https://twoseedsinapod.com/

program, said to me, "it's this element of healing, cultural and social connection, and creativity that makes regionally-produced seed sing."

Though many of us have lost some of our relationships with seed — our seed keeping knowledge, and many of the varieties our families once stewarded — relearning these practices is a form of cultural preservation and connection. Mohawk seedkeeper Rowen White writes, "people are remembering our responsibility to care for the seeds... Since the dawning of agriculture, people have been passing seeds down from generation to generation... All seeds that grace our fields and gardens and tables all descend from the collective efforts of countless ancestors, carefully selecting the right seeds that meet the needs of the family, the village, the land, the watershed, the bioregion.[3]"

EFAO and The Bauta Initiative partner with organic and ecological seed producers and farmers to advance agricultural biodiversity, and increase the quantity, quality, and diversity of locally grown, regionally adapted seed. We believe in seed systems that have many decision makers at the table, including seed growers/savers, plant breeders, farmers, consumers, chefs, Indigenous seedkeepers, and you who are reading this article. A diversity of hands working with seed are needed so that crop production matches the cultural foodways of our region's diverse populations. Regionally adapted seed is an integral way to maintain the cultural, ancestral, and social connections that matter so much.

Folks often ask me how they'll know if the seed they purchase is organic, open-pollinated, or regionally-adapted. I encourage them to ask: ask your local seed company where they source their seeds, ask where and by whom they are grown, and ask what they are selected for. The seed companies who are doing this important work will be delighted to answer these questions.

Seed Demonstration Gardens

Farmers and seed stewards across Canada create and adapt an incredible diversity of plants through plant breeding and selection. This work is at the heart of seed security and emerging regional seed systems across the country, and it is vital to sustain climate resilient agro-ecological agriculture. In 2022 and 2023, we are showcasing this work as well as trialling regional varieties at demonstration sites across Canada. These sites are places where you can see, touch, taste, and smell the beauty, deliciousness, and resilience of regionally-bred and adapted varieties. Each site will host training workshops, tours, and tasting events. This project is funded in part by the Government of Canada through Agriculture and Agri-Food Canada's Canadian Agricultural Strategic Priorities Program (CASPP), a $50.3 million, five-year investment to help the agricultural sector adapt and remain competitive.

Ontario's regional seed Demonstration Gardens are sites for exploring and showcasing 80 different vegetable varieties best suited for regional seed production, growing seed for conservation in partnership with Seeds of Diversity, and trialling okra, red pepper varieties, and carrot varieties in collaboration with farmers across the province. For more information about these sites, visit: http://www.seedsecurity.ca/engage or https://efao.ca/seed

When working with seeds you can be of service to the world – to humans, plants, soil – with roots into the past and reaching out, like bean tendrils, into the future. ■

Rebecca Ivanoff *is EFAO's Seed Program Manager. Rebecca supports farmers to learn about regional seed production, and to implement participatory variety trials and plant breeding projects as part of The Bauta Family Initiative on Canadian Seed Security and EFAO's Farmer-Led Research Program.*

Rebecca planting Bulgarian White Beans in her garden, Spring 2022. Photo by Rebecca Ivanoff.

3 https://sierraseeds.org

Can Forestry and Farming Mix?

Part One: Forestry and Farming in Ontario

By Pam Jackson, Registered Professional Forester

Climate change influences my farming choices — with less predictable rainfall, more extreme weather events, and endless unknowns, resilience building is key for long term viability. The science is clear that improving soil health plays a huge role in improving resiliency. I believe that introducing and managing woody perennials (i.e. trees and shrubs) in our pastures, hedgerows and woodlots, and integrating silvopasture practices where it makes environmental sense are good practices to achieve that end.

OPFA
Ontario Professional Foresters Association

Last winter, I took a course offered through EFAO on Silvopasture. It was fascinating and encouraging. Steve Gabriel lives in upstate New York, so his lessons were directly transferable to our location in (southern) Ontario.

What was lacking in his content was simply outside his wheelhouse — the Ontario context. I thought giving a little of this context could save a lot of folks some stress and frustration. My hope is to share pointers with farmers interested in silvopasture so that they have some of the jargon, tools and resources to navigate the forestry world successfully, and better navigate their roles as food producers, land stewards, and silvopasture innovators.

In the first installment of this article, I will share more information about the forestry context in Ontario. In part two, I will share tips from a forester's perspective for making wise silvopasture decisions.

Things you didn't know you needed to know about forestry

Historically in southern Ontario, there were no farms without forests. Farmers knew how to work in the woods, and folks who worked in the forest industry knew a lot about farming. Looking back, it's strange how I was trained in school to fragment the landscape. We drew polygons on maps to delineate this forest type from that, and labeled them according to the three or four main "crop trees" that made up each block. Reductionist thinking.

Don't get me wrong — the profession of Forestry is important. It allows for the sustainable management of Ontario's forests, which are a renewable resource if well managed. But to manage them well, we may need to think outside the blocks. More on that in part two of this article.

What is a Professional Forester?

The Ontario Professional Foresters Association (OPFA) was established in 1957 to regulate the profession of forestry in Ontario. The same law that

The sound management of Ontario's forests

The highest professional standards of practice

Public accountability for their actions

The principles of stewardship and sustainability

Adherence to a Code of Ethics

created the association also protects the term Registered Professional Forester (RPF). Under the Professional Foresters Act, professional foresters meet specified academic and experiential requirements, are accountable through enforceable Codes of Ethics and Practice, and must maintain their competence through mandatory continuing education. Professional Foresters are regulated much like chartered accountants or engineers (we even have a pinky ring and stamp!).

Professional Foresters make decisions such as when, where, and how to harvest trees and reforest areas. They also ensure the protection of forest values, including fish, wildlife, and water.

What do we mean when we say "Forest Management"?

Forest management simply means engaging with your forest in an active way. If you cut firewood, make trails, or remove invasive species, you are managing your forest.

On crown land, forest management is heavily regulated by the Ministry of Natural Resources and Forestry (www.ontario.ca/page/forestry). The Municipal Act gives municipalities the authority to pass local by-laws that regulate activity on private land.

Some municipalities do not have forest conservation by-laws, and some do. It's worth finding out what the situation is where you live. If your municipality does have a tree-cutting bylaw, some of the activities you want to undertake in your forest may be limited. For example, most by-laws have exemptions that allow firewood to be cut for personal use, but there is usually a limit on how much.

What is the definition of a "forest"?

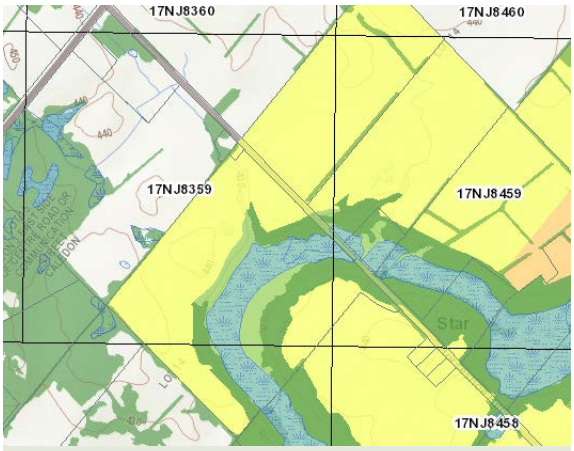
The Forestry Act defines what a forest — or, more specifically, a Woodland — is.

"Woodlands" are parcels of land with at least:

1. 1,000 trees of any size per hectare,
2. 750 trees, measuring over five cm in diameter, per hectare,
3. 500 trees, measuring over 12 cm in diameter, per hectare, or
4. 250 trees, measuring over 20 cm in diameter, per hectare,

Woodlands do not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

Your local municipality's forest conservation by-law defines the size of the treed area that is subject to the by-law. In some areas, woodlands greater than 0.2 hectares in size are protected; in other jurisdictions, the size of a woodland protected under the bylaw starts at one hectare. Foresters generally group trees together as one unit if they are within 20m of each other. A road or a river doesn't necessarily divide a forest into two small areas that are not subject to the by-law.



A Natural Heritage map showing the Species at Risk 1km grid, the Niagara Escarpment Commission designations, wetlands, forests, and property boundaries.

Why do we have laws that regulate what I do in my woodlot?

Citizens have advocated to curb the overharvesting and land clearing activities that have been especially problematic in southern Ontario. Tree cutting by-laws deter land speculators and developers from clearing forests before obtaining approval. This has been a significant issue that still happens today, even with bylaws in place. Without tree-cutting bylaws, we would have far fewer woodlots on our landscape. There is too much money to be made by those who stand to gain from removing them.

Tree-cutting by-laws have also been used to educate landowners about the importance of forest management and long-term forest management planning. The requirement for landowners to obtain a permit and work with a certified tree marker and/or a professional forester has resulted in the proper management of many woodlots. A healthy upland hardwood forest can generate more economic return for a farmer than an equal area of corn harvested every year, but only if it's managed well. Well-managed woodlots also provide more and better wildlife habitat and other ecological values that may be degraded if the woodlot is poorly managed.

Forest conservation by-laws can also be an irritation for those trying to do the right thing on their land and improve the forest. My best advice is to work with the municipality and explain your goals and objectives. They may still require a forest management plan, but that process will hopefully result in a win-win situation whereby the municipality is satisfied that you are doing what you can to enhance and protect the environment, and you learn things about your woodlot that you didn't know, which ultimately makes you a better land steward.

How can I find a Forester to work with?

If you have decided to go ahead with forest management and believe you are subject to a local tree cutting bylaw, your best course of action is to work with a forester. The OPFA website lists all consulting foresters available for hire.

Are there resources that can help me figure out what I have on my land?

What if you want to learn about your forest but you aren't interested in working with a Forester just yet? There are lots of resources online to help.

The Ministry of Natural Resources and Forestry has a fillable guide for landowners who want to learn more about their land. Their online document, Stewardship Planning for Natural Areas, is a great resource for those who want to work on their own plans and need some guidance.

Additionally, there are some excellent mapping resources out there for free. The Make A Map: Natural Heritage Areas tool on the government of Ontario website is a resource that can show you all kinds of information about your property. For example, you can look up what Species at Risk have been reported in your area, which might encourage you to create an appropriate habitat for that species, such as ground nesting birds like bobolink and eastern meadowlark. If these species are reported as being near you, consider leaving some of your hay fields or meadows ungrazed or uncut until after July 15th so that the baby birds can fledge.

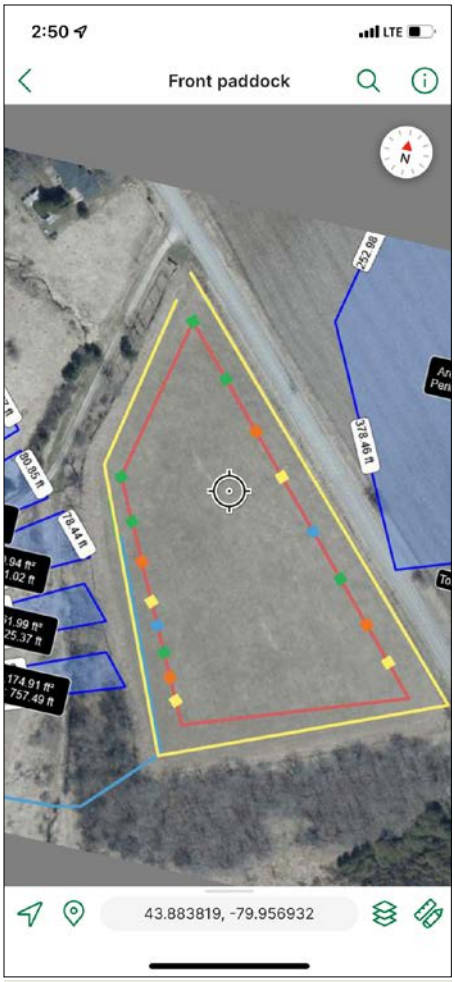
Conservation Authorities also have mapping on their websites that shows the wet areas (rivers, wetlands, etc.) that they may monitor or manage. Work such as bringing in fill or removing fill within regulated areas may require a permit, so it's worth looking into if you have these features on your land.

Other Mapping resources

The Avenza app allows you to open maps with georeferenced data (like those that have been exported from the Ontario Make a Map website) on your smartphone. When you open the map on your phone, you can then locate yourself on that map. I am using this feature to layout my grazing paddocks in the fields. I measure the paddocks I want to make on the computer and then simply add a pin where I want to put the corner of my paddock in the field. Then, in the field with phone in hand, I can locate myself on the map and simply walk to the map marker to place the fencing where it needs to go.

Hopefully this information proves useful in your farming practice, and gets you thinking about forest management on your farm. In part two of this article, I will share more information about applying forestry knowledge to silvopasture decisions, including choosing forests well-suited to silvopasture. ■

Pam Jackson *is a Registered Professional Forester from Caledon, Ontario with expertise in forestry and farming. She operates Broken Gate Forestry, where she helps rural landowners manage their properties.*



The Avenza map on my phone. The coloured pins around the red line on the field are where I placed the corner posts of my temporary fence. This allowed me to give my animals the roughly same area of land every day.

Why Sample, and What is Your Soil Test Telling You?

By Dillon Muldoon

After over a decade of trial and error, consulting with experts, and a deep dive down the rabbit hole of soil health, Evan Quigley of The Kitchen Garden Farm in Wilton, Ontario offered some advice and insights in his EFAO-hosted webinar, *Interpreting Soil Tests and Choosing Amendments* in March of 2022. This article is a summary of Evan's webinar, with some additional information added.

This article offers general information on understanding soil tests and possible amendments. Every farm and soil type has its own unique needs. The EFAO recommends accessing additional educational materials and/or consulting with an advisor before making amendment decisions.

Healthy soils are a vital part of ecological agriculture and a resilient food system. They can improve crop yields and quality, help us reduce greenhouse gas emissions, and become carbon sinks. They can act as a sponge, allowing for better infiltration and water holding capacity, leading to greater resilience during droughts and more resistance to erosion.

Soil health can be measured by the optimization of the biological, physical, and chemical properties in a soil. Although both biological and physical function are very important, this article focuses mainly on the chemical properties that can be interpreted from a soil test.

Why should I take soil samples?

Soil sampling is an integral part of a grower's tool-kit when it comes to building soil health and enhancing crop production. Taking soil samples helps you better understand soil fertility, so you can make informed decisions to improve yields and protect the environment.

It is nearly impossible to make accurate nutrient recommendations without a soil test. This information allows you to tailor your fertility programs, which benefits your production systems. It also allows you to reduce nutrient leaching, which benefits the environment. Relying on crop removal numbers alone without knowing your soil nutrient balance can lead to potential yield losses and/or over application of amendments.

What should I sample?

You want your soil test to inform five main soil elements:

1. cation exchange capacity;
2. soil organic matter (SOM) as a surrogate indicator of soil health;
3. percent base saturation;
4. soil pH or buffer pH; and,
5. primary and secondary nutrients as well as micronutrients.

When testing with A&L Labs, Evan recommends getting the **S1B** base soil analysis and also adding the **+S7** for individual micronutrients.

When should I take soil samples?

A soil test is a "snapshot of exchangeable plant nutrients at a given time," and a tool to make amendment and cropping decisions for the next season. This snapshot is usually taken in the **fall after the crop is harvested** when nutrient levels in the soil will be similar to next year's spring planting.

One soil test is good, but more than one over a number of years is ideal. Updated soil tests allow you to understand your current nutrient balance and, alongside with previous soil tests, allow you to identify trends.

When sampling over the years, consistency is key! Taking samples at the same time each year and using the same lab services allows for more accurate comparisons of test results. In the fall after your crop has been harvested is an ideal time to take soil samples. The fall sample collection timing allows you to spread out the workload so it doesn't conflict with the busy spring season, and can help save time on winter crop planning and money on amendments.

What is my soil test telling me?

Cation Exchange Capacity

The cation exchange capacity, or CEC, is a measure of the soil's ability to store positively-charged nutrients such as potassium, calcium, magnesium, and sodium. In general, the CEC correlates with soil texture: the more clay and soil organic matter a soil contains the higher its CEC will be. Soils with a CEC below 10 are usually sandy, from 10-20 are generally a loamy or medium textured, and above 20 have a fairly high clay content.

Soil Organic Matter

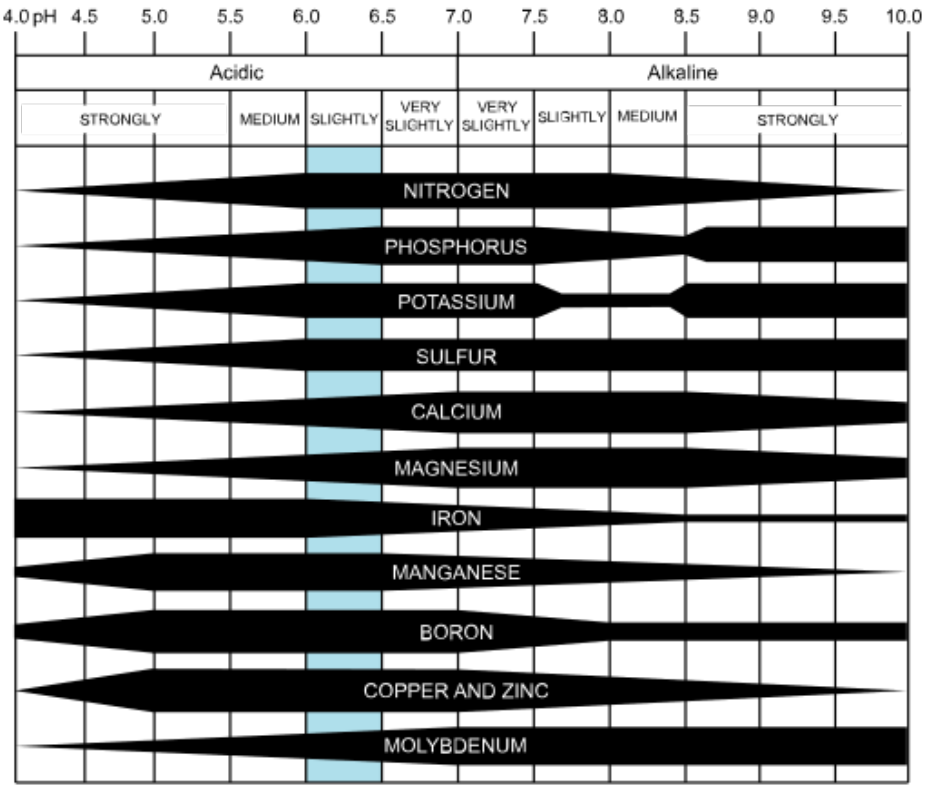
Soil organic matter, or SOM, is the fraction of the soil that consists of plant, animal, and microbial cells and tissue in various stages of decomposition. SOM is approximately 68% carbon, and microbial necromass (i.e. dead microbes) can make up more than half of the SOM of soil. The higher your SOM the better. OMAFRA offers recommendations for minimum SOM by soil texture: sandy soils should be around 2.5%, sandy loam 3.5%, loam 4%, and clay loam and clay soils at 4.5%.

Percent Base Saturation

Base saturation is the ratio of calcium, magnesium, potassium, hydrogen, and sodium in the soil. When these nutrients are balanced with one another, and in optimal ranges, they provide the ideal environment for microbial activity, and help form good soil structure and water holding capacity. The ideal ranges for calcium are 70-80%, magnesium 12-18%, hydrogen 0-15%, potassium 3-5%, sodium less than 1%.

pH

pH is the acidity or alkalinity of a solution on a scale from 0 (extremely acidic) to 14 (extremely alkaline). 7 is neutral. A soil's pH has a direct effect on nutrient availability. Evan suggests that soil pH becomes self adjusting when the base saturations of calcium, magnesium, potassium, sodium, and hydrogen are in balance. A soil pH anywhere between 6.2 and 7.0 is ideal for nutrient uptake and soil biology.



Nitrogen

Nitrogen (N) is an essential element for plant growth and development including chlorophyll, enzymes, amino acids, and contributes to increased yields and protein content. Most base soil tests done in Ontario don't include nitrate analysis, as it is a very mobile nutrient in the soil due. Most crops have a N recommendation based on yield goals, but when adding N it is important to account for residual N and N credits from previous crops or cover crops. Nitrogen needs for an organic system can all be supplied by cover crops when the right array of legumes and termination strategies are used. Other amendment options include manure, compost, meals, and fish products.

Phosphorus

Phosphorus (P) is an important nutrient for plant growth at all stages and soil microbial communities. There are two common lab analyses for phosphorus and your soil pH will influence which one you use to calculate applications. For soils with a pH less than 7, the Bray P1 test will be used, and for soils with a pH greater than 7, the Olsen bicarbonate test. Some amendment options to add phosphorus are bone meal, soft or hard rock phosphate, and compost or manure.

Potassium

Potassium (K) is important to plant growth and helps with drought resistance and enhanced water uptake. It is critical for plant quality and yield, especially in fruits and vegetables. Total K requirement is affected by CEC. To achieve 4-5% from base saturation Evan offers the following calculation to determine total required K in ppm: **CEC * 780 * 4%)/2**. Some amendment options to add potassium are potassium sulfate, KMag, and wood ash.

IMPORTANT: Mind your Ps and Ks! Many amendments list P as available phosphate (P_2O_5) and K as available potash (K_2O). To convert P to P_2O_5 multiply by 2.29 or to convert P_2O_5 to P divide by 2.29. To convert K to K_2O multiply by 1.21 or to convert K_2O to K divide by 1.21.

Sulfur

Sulfur (S) is an important plant nutrient for protein synthesis and chlorophyll formation and is a key part of the compounds imparting flavour and aroma to many plants, particularly the allium family. The recommended level of sulfate is 20-35ppm. Some options to add sulfur to the soil include, elemental sulfur, gypsum, potassium or magnesium sulfate, and KMag.

Micronutrients

Although micronutrients are needed in small amounts, these do not reflect their relative importance to the growing plants. They often serve as catalysts and work in conjunction with major nutrients. They can be essential for disease and pest resistance. When applying, caution must be taken as excess application can quickly become toxic to the plants and soil.

Important micronutrients include:

- boron – recommended to be around 2ppm in a soil test; can be amended with solubor or borax;
- zinc – recommended to be between 5-10 ppm in a soil test; can be amended using zinc sulfate;
- copper – recommended to be between 2-3 ppm and can be amended using copper sulfate;
- iron – recommended to be greater than 50 ppm in a soil test and can be amended by iron sulfate; and,
- manganese – recommended to be between 40-80 ppm on a soil test and can be amended using manganese sulfate.

What do I do with my soil test?

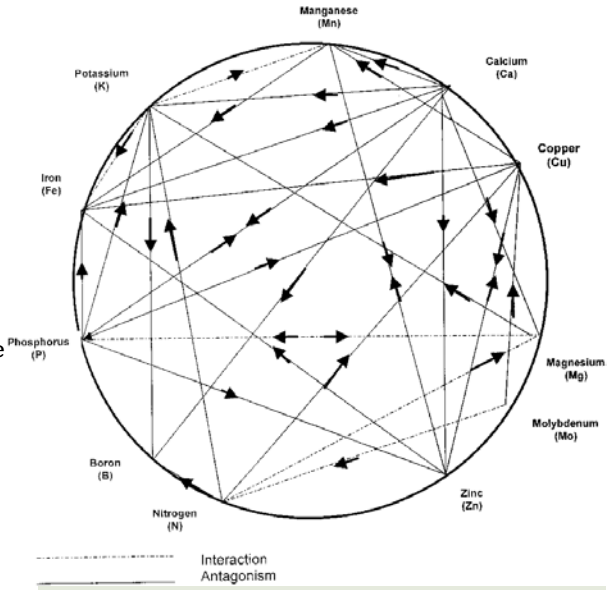
After receiving your soil test it is important to interpret and understand the results, remembering that this test is just a snapshot in time.

To do this, Evan has created a spreadsheet that can help you take the information provided in a soil test and choose and balance amendments for field applications. Hyperlinks to these tools can be found in the digital version of this magazine.

When using this tool, it is important to keep in mind the potential antagonisms and synergies between any two nutrients (see Mulder's chart). It's all about balance. An excess or deficiency of one nutrient can have a huge impact on another nutrient's availability. Knowing these interactions can help us make more informed decisions on how to amend the soil.

After you understand your results, it's time to design a fertility program based on your soil, soil tests, and cropping plan.

Evan recommends always applying amendments within a carbon source (compost, humates, or biochar). Less is often more. Doing split applications over a number of years, especially for micronutrients and trace elements, is recommended. Remember that this isn't a one and done thing — don't expect to fix everything in one go. Keeping the soil balanced and productive is an ongoing process and needs to be assessed continually. Finally, Evan suggests making major corrections in autumn, especially with things like calcium. ■



Mulder's chart shows some of the interactions between plant nutrients.
Source: Researchgate.net.

Soil Amendment Tools:

- Evan's Soil Spreadsheet – thekitchengarden.ca/soil
- OSCIA's Soil Test Manager – soiltestmanager.ca
- OMAFRA's AgriSuite – agrisuite.omafra.gov.on.ca

Other helpful conversions:

- mg/L = mg/kg = ppm (parts per million)
- P in ppm multiplied by 4.6 = P2O5 in lbs/ac
- K in ppm multiplied by 2.4 = K2O in lbs/ac
- Other elements in ppm multiplied by 2 = element in lbs/ac
- Results in kg/ha multiply by 0.455 = ppm

Dillon Muldoon *is EFAO's Research and Soil Health Program Manager. He is passionate about agriculture and food systems and has a broad range of research interests including agroecology, sustainable production, soil health, community food systems, integrated pest management, and agricultural education and outreach.*

Raising Crops on the Roof: Benefits and Obstacles

By Dillon Muldoon and Sarah Larsen

Urban agriculture has some unique challenges, which can be exacerbated on green rooftops. Yet green roof farming also offers distinct opportunities for growers and the local community.

EFAO staff chatted with operators from rooftop farms in Toronto, Montreal, and Brooklyn, NY to discuss what it's like farming on green roofs.

The Urban Farm at Toronto Metropolitan University (TMU)

Sharene Shafie is Research Coordinator and Ines Lacarne is Field Coordinator for The Urban Farm at TMU, which started as a student-led initiative in 2011 and as a pilot project on the roof in 2013. The farm is now woven into the institutional landscape of the University. It supports interdisciplinary research for agricultural green roofs and produces food and educational opportunities for the community. The farm has recently established a second location: the Daphne Cockwell Health Sciences Complex (DCC) rooftop farm, which is the first purpose-built rooftop farm built under Toronto's green roof by-law. This new space is dedicated to Indigenous and Black-led food sovereignty initiatives.

The farm has adopted a model of thirds in which one third of its produce is sold at market rate, one third is sold at a reduced rate to students and staff, and one third is donated to community partners. Producing more than just food, the farm offers a space to engage stakeholders in conversations around food justice and the ecosystem benefits of green roof growing and urban agriculture.

La Ligne Verte: Maraîcher

Antoine Trottier is President and co-founder of La Ligne Verte/ The Green Line, a landscape company specializing in the installation and maintenance of urban greening projects and urban green roof farming in Montreal.

Antoine's first project was a collaboration with Sobeys to install a green roof farm on top of an IGA in Ville St-Laurent in 2016. This partnership allowed for the development of one of the largest rooftop vegetable gardens in Canada, at 28,000 sq ft. All of the produce grown on the green roof is sold in the supermarket '44 steps below' under a brand called Frais Du Toit/Fresh From The Roof. The operation is certified organic. La Ligne Verte is currently working on a second collaboration with Sobeys in the South Shore of Montreal, with the possibility of additional projects in future.

The TMU team evaluates the soil at the DCC site of The Urban Farm as part of an EFAO farmer-led research project to evaluate biochar as a soil amendment for rooftop farms. Photo by TMU Urban Farm.

Brooklyn Grange

Ben Flanner is the co-founder and CEO of Brooklyn Grange, a leading rooftop farm and green roofing business based out of New York City. Brooklyn Grange manages three large rooftop leases totaling around 5.5 acres of vegetable production, as well as 60-70 different urban green spaces of varying sizes, all of which are located in the five boroughs of New York City.

Around 40 per cent of their food is donated to food pantries and kitchens, and around 60 per cent is sold as a part of their CSA, at farmers markets, or wholesale to restaurants.

Challenges of green roof agriculture

Soil substrates

Green roof soil substrates must adhere to local building standards for load restrictions, fire safety, drainage, vegetation and wind loads. As such, most engineered green roof substrates have large particle sizes, lots of aggregates, are low in organic matter, and have low water retention. These characteristics make them less ideal for agricultural production.

"A perpetual challenge with rooftop soils, at least all the ones that I've encountered... is that pH is hard to get below seven because the minerals that get blended in are typically fairly basic," explains Ben.

Organic matter is another big challenge. When Antoine started La Ligne Verte, "the organic matter mineralization was pretty fast and the nutrient retention was low, so we had to add a lot of compost every year. It took about two years for things to stabilize," he says.

"The new soil blends contain a lot of large brick particles and corser aggregates," Sharene adds. Figuring out how to quickly build up organic matter has been a challenge.

Green roof building restrictions also mean that soil depth is a challenge.

"We only have around six inches of soil depth; with the membrane underneath that collects water it's really only equivalent to about eight inches of soil," explains Antoine. "So it's pretty thin, and although we can produce a lot of vegetable crops...it dries up pretty fast."

At The Urban Farm, the soil depth is an obstacle as well.

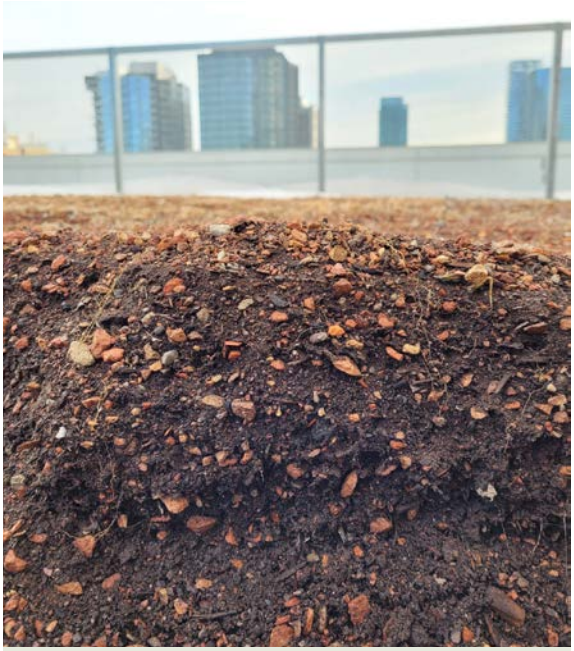
"There are certain tools that we just can't use, and limitations in terms of installing infrastructure like trellises for crop support, or anchoring things in the ground, because we have to be mindful of not affecting the membrane in the green roof," says Ines.

Although the soil depth that Ben works with in Brooklyn is closer to 12" (it varies by location), he also finds soil depth can be an issue.

"One of the biggest differences on a roof, which is noticeable for some but not other crops, is that you don't have a sub soil. This affects the soil temperature in the winter, making it harder for deeper rooting perennials to overwinter," he explains.

Cost of production & economies of scale

"There are a lot of barriers to entry and it's very costly to get into rooftop farming," says Ines. "We don't generate nearly close to enough to cover the costs involved in running the space by growing and selling food, but being associated with a university means we can leverage other resources to support the farm, and create resources for others."



Green roof substrate composition at the DCC rooftop farm in Toronto. Photo by TMU Urban Farm.

It's a similar story for Ben and Antoine. "For the vegetables themselves, the margins have eroded yearly for around the last five or six years," says Ben. They used to have a positive margin on the vegetables alone, but now it's basically break even. Brooklyn Grange will "spend basically every dollar we make on producing [the vegetables], between labour and logistics and direct costs."

Antoine did some benchmarking to better understand the profitability for their operation. "It will take two or three rooftop sites before our revenue becomes more stable... even though [Ville St-Laurent] is a pretty substantive site, it's not enough growing space on its own," he says.

Labour & land tenure

Ben speaks to the importance of understanding fair labour prices in an urban context. "Especially in today's urban economy, you can't be in that race for rock bottom labor costs. It's just not even appropriate to think about low labour costs in a city, because the cost of living is so much higher," he says. "We're not trying to be part of that exploitative aspect of the food system. Labour costs push your profitability to break even at best. But it's okay to name that and be aware of it."

Antoine's noticed "it's hard to find a good fit with farmers that are dedicated when it's not theirs." It is also hard to use the rooftop farm as an incubator farm when ownership isn't an option in this context. "So that part needs to be fine-tuned in this model."

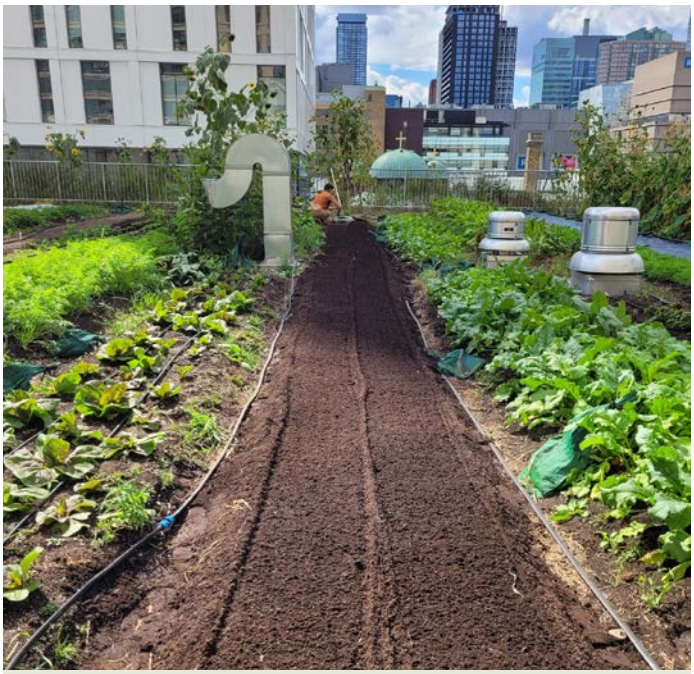
Benefits of green roof agriculture

Urban food production

The ability to produce locally grown vegetables in urban communities is a benefit mentioned by all producers. As Ben puts it, "from the three rooftop sites, [Brooklyn Grange] has the potential to easily produce around 80,000 pounds of super healthy, fresh food a year – and that's no small amount."

But all three farmers also reminded us that it's not the be all, end all solution.

"I think people maybe get kind of attached to the idea [that] rooftop



A new bed is prepared for planting at TMU's converted green roof at the George Vari Engineering & Computing Center. Photo by TMU Urban Farm.

farming will solve food security, and if we had a lot more rooftop farms in the city it would definitely help, but it's just one avenue," says Sharene.

"I tend not to really overstate the benefits of rooftop farming in terms of food security and climate mitigation, because it's such a drop in the bucket," echoes Ben. "We grow a lot of food on rooftop farms, but it's really not anything in terms of the total amount of vegetables consumed. Nor do I ever think it will be, so I don't really talk about it in those regards. However, I don't want that to diminish the value of scaling up green roofs in general – they are hugely important to our society."

Unique to rooftop farms is the opportunity for green roof farms to become certified organic in the first year of production, without waiting for the three year transition period, Antoine points out. This allows new ventures to obtain price premiums in their first growing season, to help offset the setup costs.

Nature connection & food education

Advantages of rooftop farms include "added production, utilizing these spaces more efficiently, and elevating the biodiversity on the roof, versus just having the owner," Antoine says. "You can create jobs, and for the owner, you don't have to spend resources to just maintain the green roof."

"This space can [also] manage stormwater, mitigate the urban heat island effect, and be a site of biodiversity," adds Sharene.

Sharene, Ines, and Ben also speak of the value of rooftop greenspaces as community hubs for education and nature connection — something they see first hand, given how The Urban Farm and the Brooklyn Grange are interwoven with community stakeholders.

"Green spaces with food production are also a space to promote healthy living and healthy eating habits," Ben adds.

"There's an opportunity to be a space for food justice — bringing key people into the fold and giving them agency to create programming and growing spaces, to meet the needs of specific communities," says Sharene. "A site where the community can come and connect with each other, the plants, the insects, and the ecosystem... the education piece can reconnect people with their food system at a time when we are so disjointed."

Although they may not be a broad solution to food system issues, green roofs offer important spaces for organic food production, knowledge sharing around food production and healthy eating, and access to food and nature in urban centers, sustainable and organic food production. ■

Dillon Muldoon *is EFAO's Research & Soil Health Program Manager. He is passionate about agriculture and the food systems and has a broad range of research interests including agroecology, soil health, and community food systems.*

Sarah Larsen *is EFAO's Research & Small Grains Program Director and also supports the soil health components of EFAO's education programs. Along with her partner and their daughter, she also tends the land that they call Three Ridges Ecological Farm near Aylmer, Ontario.*

Who Will Feed Us?

By Rav Singh

It's 7 in the morning. The sun is already beating down on me during yet another extreme heat event. As I'm putting on my sunscreen, I can't help but wonder why I do this. I wonder if it would be easier if I just got a 9 to 5 office job (not to mention cooler too!). What would happen if I just walked off the field towards an air-conditioned office and never looked back?

Then I think to myself, "Well, it's too late to do that today. You already put on your sunscreen and bug spray, may as well stay here." To take my mind off the heat, my broken irrigation system, the urban sprawl inching closer and closer, and all the flea beetles devouring my kohlrabi, I hit play on the next podcast queued up on my phone as I get to work. Today's podcast is "Who Will Feed Us" from the National Farmers Union.

The *Who Will Feed Us* podcast can be heard at anchor.fm/who-will-feed-us-podcast/ or wherever you get your podcasts.

Learn more at whowillfeedus.ca.

This podcast is co-hosted by Ayla Fenton, Stuart Oke, Aliyah Fraser, and Madeline Marmor. I am immediately captured by the confidence and insight displayed by all the co-hosts. I also find it so refreshing to hear from other youth talking about some pretty big topics! I believe youth can have a very unique and radical outlook and it was great to know there is a platform amplifying these voices! I really appreciate how each episode is only 30-35 minutes long. It makes the content and these really big, heavy topics which they are discussing much easier to digest. Some examples of things discussed in the podcast include the corporatization of agriculture, land access, climate change, and migrant farm workers.

Each episode has a different co-host so we have an opportunity to hear different perspectives.

I have to admit — I binged the entire podcast that day. And by the end of the day I was reminded of why I do this — why I wake up at 5am every day to grow food, why I push back against urban sprawl that threatens where I farm, why I advocate for food and climate policy that is informed by youth. This podcast reminded me how important my work is as a tool of resistance against the corporate take-over of agriculture. It reminded me that it's ok if I don't want to "own" land because farming on land can happen in so many ways outside of "ownership" and it's these models that are key to our climate crisis and food sovereignty issues. It reminded me of the importance of fighting for a living wage for all, regardless of status, and supporting migrant rights. And, it reminded me that everything I am doing is supporting more just and ecologically sustainable food systems.

As a young and new farmer, it is so amazing to hear the experiences and thoughts of all the co-hosts — it feels like listening to a conversation with friends! If you are not a young farmer, I would still highly recommend this podcast to learn more about the revolutionary thoughts, experiences and actions youth are bringing to the food movement! ■

Rav Singh *is the head farmer and founder of Shade of Miti, a food and climate justice organization in Mississauga, where she works with communities that face marginalization to build sustainable food systems that are rooted in justice and sovereignty, and not threatened by climate change.*

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