British Columbia Organic Grower

Bioregionalism

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COABC
Certified Organic Associations of BC

In This Issue

Gathering the Harvest Around the World

Lovena, Ryan, and family travel the world to source the best in herbs and spices with the Gathering Place Trading Company. *Read more on Page 8.*

Features

Are Weeds Talking to You?

Don't be shy! Listen to what they have to say. Av Singh demystifies their messages *on page 28.*

BC Organic Grower

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On the Cover: Lovena and Ryan of Gathering Place Trading Company at a pineapple farm. Credit: Gathering Place Trading Company.

Editor's Note

By Darcy Smith

"Bioregionalism means learning to become native to place, fitting ourselves to a particular place, not fitting a place to our pre-determined tastes. It is living within the limits and the gifts provided by a place, creating a way of life that can be passed on to future generations," Judith Plant writes. Every farmer goes through this process of learning about their land, and how they "fit" into that ecosystem. Organic farmers most of all are attuned to the idea that their farming activities must respect the "limits and gifts" of any particular piece of land.

Care for the environment beyond the farm is at the core of the organic principles, and along with that, the idea that the farm cannot be separated from the larger ecosystem. In our summer 2018 issue, we continue exploring the theme of bioregionalism, looking at how farming links to the ecology and environmental capacity of place.

On page 7, we dive right into biodiversity and the Canada Organic Standards with inspector and farmer Stuart McMillan. That theme is picked up again on page 11, as Tanya Brouwer highlights management practices for enhancing native species on the farm. On page 28, Av Singh has some sage advice about learning to listen to weeds.

In Footnotes from the Field, Marjorie Harris celebrates pollinators and the influence they have across ecosystems (page 20), and, because pollinators are a hot topic these days, page 24 features a look at integrated habitat development for bees—and birds and fishes, too.

Our featured Organic Story takes us around the world with Gathering Place Trading Company, sourcing herbs, spices, and tea from bioregions far and wide, including our own (page 8).

The Foodlands Cooperative of BC offers one way for farmers to find their way onto land and begin the work of "learning to become native to place"—on page 12, Michael Marrapese looks at Lohbrunner Community Farm, the first property taken into trust under the Foodlands model.

As we move from a season of intense flooding that has challenged many farmers in our community into what is already looking like another season of intense forest fires across BC, it felt timely to include a piece by off-the-grid rancher Shanti Heywood about her experience with the fires—and her resulting endorsement of rotational grazing (page 16). Her photos from the wildfire front give me shivers every time.

We're always looking for story ideas and writers to help share all the wonderful things happening in the organic community—do you have something to say about bioregionalism, or organic farming? Reach out with your thoughts, letters, and story ideas to editor@certifiedorganic.bc.ca—and be sure to visit us online.

bcorganicgrower.ca.

COABC Cyberhelp Organic Price Tracker

COABC has heard from many of our members about the value of Cyberhelp and the organic price list. The Cyberhelp resource has been unavailable since the fall of 2017, and we understand that it has been missed. COABC is working to redevelop Cyberhelp—including the price list—to support organic farmers and food producers. In the meantime, the Organic Price Tracker from Canadian Organic Growers (COG) is available and may be of help.

The Organic Price Tracker is a source for regional prices of certified organic products sold both at farmers' markets and wholesale. Prices represent a minimum-maximum range based on information that has been voluntarily provided by certified organic producers.

COG is continually working on adding more pricing information to the database. If local data is missing, it means the organic producers and distributers in your area have not yet submitted their data.

cog.ca/home/find-organics/organic-price-tracker-database

Meeting with the Minister

By Heather Stretch

In May, Jen Gamble and I met with Minister of Agriculture Lana Popham, Deputy Minister Wes Shoemaker, Assistant Deputy Minister Arif Lalani, and Ministerial Assistant Samuel Godfrey. All were very open and interested in the BC Organic sector. We were very encouraged by several things but most of all their willingness to work with COABC. The Minister was happy to get a general update on COABC, our Strategic Plan, and the sector in general. They were particularly glad to hear how much we appreciate Emma Holmes in her role as Organic Specialist and learn of all the work she's doing.

We had the opportunity to highlight several projects that correlate with the goals of COABC's Strategic Plan. There was particular interest in projects that aimed to help farmers as directly as possible. The projects that sparked the most enthusiasm were the Organic Online System (everyone saw how this piece is critical to assisting transition, to engaging farmers, to gathering data, to making a future brand names list accessible, etc.), updating the checkmark, and, to our surprise, supporting a comprehensive CORE review of COABC.

There was also consensus that continuing to work toward an alliance with the other small-scale organizations would enhance communication between the Ministry and the diversified, ecological food system. The next step will be to create proposals for the top priorities that align with the Ministry of Agriculture's mandate.

Read COABC's Strategic Plan here:

certifiedorganic.bc.ca/docs/COABC_StrategicPlan_2018-2023.pdf

New Faces at COABC

This spring, long time head of the Accreditation Board (AB), Molly Thurston, moved on from her position to focus on farming and family. Molly was a diligent and detail-oriented leader of the AB, and we thank her for the time and energy she dedicated to managing the accreditation arm of COABC. We are also excited to announce our new AB Director, Maureen Loft. Welcome, Maureen—we look forward to a fruitful relationship!

TOP: Maureen Loft, new Accreditation Board Director. ABOVE: Samantha Graham, COABC's new Administrative Assistant.

Maureen and her three children have lived in the Okanagan since 2003. She has an extensive career in administration within the public service sector including healthcare, municipal and post-secondary organizations. She holds a degree from UBC in Agricultural Economics and received a certificate from Capilano University in Local Government Administration. Maureen is a strong leader with skills and experience in administration within complex organizations, leading teams through process and legislative change, project management, change management, procurement law, and continuous improvement. She is keen to contribute to the health of people and families and at the same time take care of our environment.

This month, we also welcomed Samantha Graham, our new Administrative Assistant, to the COABC office. Samantha has a B.ASc in Sustainable Agriculture from KPU, and after graduating moved to Australia, where she spent time picking fruit. She also works with the Food Action Society of the North Okanagan as the Farm and Garden Manager. She is passionate about supporting local food systems and excited at the opportunity to work with BC's organic operators. Having recently moved to Vernon from Langley, Samantha is enjoying getting to know her new home by exploring the mountains and lakes of the Okanagan.

Flood Preparedness Information

The province of BC has activated the Southwest Provincial Regional Operations Center (SW PREOC) to support the response to the 2018 lower Fraser River freshet and the potential for flooding. Additional PREOCs have also been activated in other regions of the province due to the flooding situation and the following information is also applicable to those impacted regions. The Ministry of Agriculture is providing support to Local Governments, First Nations, and agricultural producers through the PREOC. Below are a number of links to provide producers with key information and resources to assist them in preparing, responding and recovering from potential flooding and related impacts.

Producers requiring assistance should first contact their Local Government or First Nation Band Council. Local Governments and First Nations can in turn seek any additional support they require by contacting the SW PREOC.

Find out more information about flood preparedness, including links to resources on the Young Agrarians blog:

youngagrarians.org/flooding-preparedness-farmers

Local Meat Production & Inspection

Consultation now open!

The Select Standing Committee on Agriculture, Fish and Food invites British Columbians to share their input and ideas regarding local meat production and inspection. The Minister of Agriculture released a discussion paper on April 24, 2018, and in support of this, the Committee has launched a public consultation process, including holding a number of public hearings throughout BC.

The Committee's consultation portal has now opened to allow those interested to register to present at a public hearing, make a written, audio, or video submission, or complete an online survey. The consultation will close on Friday, June 15, 2018 at 5:00 p.m. and the Committee will release their report on or before October 1, 2018. Go to the

Committee's consultation portal to register to present at a public hearing, make a written, audio or video submission, or complete an online survey.
More information, including a list of public hearings:

https://www.leg.bc.ca/parliamentary-business/committees/41stparliament-3rdsession-aff/

Consultation portal:

https://consultations.leg.bc.ca/Submission/Create?cons=LocalMeatProductionandInspectionConsultation

Discussion paper:

https://www.leg.bc.ca/content/CommitteeDocuments/41st-parliament/3rd-session/aff/MofAgriculture_DiscussionPaper_2018-04-24.pdf

Canadian Agriculture Partnership

The federal and provincial governments have agreed to a five year funding partnership investing $115 million in BC programs that will offer widespread support to the farming, ranching and food-processing sectors.

The partnership will offer enhanced programs for market development, agri-technology and on-farm and processor food safety, as well as continuing climate adaptation, the Environmental Farm Plan program and business-development services. New programs will target knowledge transfer from agricultural leaders to new farmers, as well as a continued suite of support services to prepare and support new entrants.

"British Columbia is developing programs that will help farmers, ranchers and food processors create new technology and products, expand sales, improve their efficiency and sustainability, and protect themselves from crop losses and income declines," Popham said. "We're also looking at ways to support new entrants and young farmers, so agriculture in BC attracts new businesses, revenues and employees, and reaches new levels of success in the next five years."

The five year, $3 billion Canadian Agricultural Partnership includes $2 billion in cost-shared strategic initiatives delivered by the provinces and territories, and $1 billion for federal programs and services. Under the partnership, farmers will continue to have access to a complete and effective suite of business risk-management programs to help them manage the significant risks that threaten the viability of their farms, and are beyond the farmers' capacity to manage.

The partnership replaces Growing Forward 2, the five year federal-provincial agreement that ended March 31, 2018.

More information on Canadian Agricultural Partnership programs in BC:

www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs

Environmental Farm Plan Program

As part of the Canadian Agricultural Partnership, the Environmental Farm Plan Program will continue! Funding for this program is provided by the new Canadian Agricultural Partnership. "The Environmental Farm Plan program is a highly valued program for producers in BC," says Allen James, ARDCorp Board Chair. "It has assisted B.C. farmers and ranchers in making environmentally positive changes to BC farm practices for the past 15 years and we look forward to continued partnership in the delivery of this successful program."

Since its inception in 2003, over 5,000 farms have completed an Environmental Farm Plan in British Columbia. The program comes at no cost to producers and helps identify both environmental strengths and potential risks on a farm. Further, there are nearly twenty planning advisors located across the province that assist producers through their plans – which is unique to British Columbia.

The associated Beneficial Management Practices (BMP) program, which assists producers with funding to address environmental risks, is anticipated to reopen in mid-June. Program details will be available at the end of May.

Read the government's recent announcement here:

news.gov.bc.ca/releases/2018AGRI0020-000615

New Link for Filing a Complaint on CFIA Website

The Canadian Food Inspection Agency (CFIA) has added a section to the website of the Canada Organic Regime OR Standards: File a complaint related to the Canada Organic Regime (COR)

inspection.gc.ca food/organic-products/file-a-complaint/eng/1518546270126/1518546271092

For any product sold in Canada with a suspected fraudulent organic claim, complaints can be filed against the operator (company) holding certification under the COR scope, CFIA-designated Conformity Verification Bodies (CVB), CFIA-accredited Certification Bodies (CB), and the Canada Organic Regime (COR) team.

BIODIVERSITY

And the Organic Standards: An Inspector's View

By Stuart McMillan

Originally published in The Canadian Organic Grower, Spring 2018, with thanks.

There are a number of great reasons to be an organic inspector. For myself, the primary one is getting to meet so many fantastic farmers, ranchers, and operators of organic operations across the diverse regions of Canada. Being able to ask people their reasons for decisions and directions on their operations is part of the job, and having them open up the entirety of their farms and facilities is an added perk. I have seen some stunningly beautiful corners of the country in my work. One element that stands out is the diversity of approaches taken in different regions of the country to achieve a common goal.

One of the strengths of the Canadian organic standard is that it recognizes the climatic and ecological diversity of the country and that the approaches taken in one region may not be suitable for another one. This approach is written right into the standards: "In the development of the standard, it was recognized that differences between Canada's agricultural regions require varying practices to meet production needs" (CAN/CGSB-32.310, Introduction).

But this leads to one of the challenges I have encountered. Various goals and outcomes are mandatory across these regions. For example, it is expected that all organic products will come from a production system that "provides weed, pest, and disease control through enhancement of biodiversity, recycling of plant and animal residues, crop selection and rotation, water management, tillage, and cultivation" (CAN/CGSB-32.310, 1.2b).

This creates some curious challenges while trying to conduct an inspection in an efficient and expedient manner. How does one assess the enhancement of biodiversity? Some farms I have been to have a deep understanding of their region's ecology and have implemented various practices to promote biodiversity, while other farms appear to not even know this is a requirement.

In recent years, the US organic standards have tried to strengthen their promotion of biodiversity with linkages with other agricultural conservation organization like the Natural Resources Conservation Society (NRCS) to promote best land use practices by farmers. NRCS has developed a focused organic program called "Conservation for Organic Farmers & Ranchers" (www.nrcs.usda.gov/wps/portal/nrcs/main/national/organic).

To date, Canada has been slower to have extensive federal support to promote on farm biodiversity. With the reduction in provincial extension services, especially services that can provide organic expertise, farmers find their support networks limited. Without sound guidance on how to improve biodiversity in a meaningful manner, many farmers are uncertain how to move forward. As a result, we continue to find this discrepancy of ecological practices on organic (and non-organic) farms in Canada.

While the flexibility of the organic standards can be an advantage, they are also at times ambiguous. Ambiguity leads to confusion, confusion leads to inaction. Inaction, when it comes to promoting biodiversity on organic farms, leads to erosion of the goals and outcomes of the organic system.

Stuart McMillan is the manager of Legends Organic Farm. He inspected organic farms, ranches, and processors across North America for over 10 years.

GATHERING PLACE TRADING COMPANY

From Farmer to Family

Women farmers harvesting herbs in India. Credit: Gathering Place Trading Company

By Renée Hartleib

There can be major advantages to getting lost. Just ask Lovena and Ryan Harvey, owners of Gathering Place Trading Company, a family run company in BC.

Fifteen years ago, they were travelling in South Africa, Ryan's birthplace, in their vintage VW camper van. On an afternoon jaunt through the countryside, they got lost and ended up asking for directions at an organic Rooibos farm. At the time, the Harveys were organic farmers back in Canada, so this felt like an interesting coincidence.

It soon turned into much more than that. The farmer invited them in, and the couple were treated to the best cup of tea they had ever tasted. Being tea connoisseurs, Lovena and Ryan were full of questions. What made this tea so different? They discovered that the farmers took the time to harvest their certified organic tea by hand, fermented it in small batches, and then sun dried it, resulting in a superior quality Rooibos.

A friendship was formed that culminated in Lovena and Ryan deciding to try their hand at tea selling back in Canada. They proposed an unorthodox trade. A ton of tea for the VW camper van that their new South African friends had fallen in love with.

The rest, as they say, is history. But first, the Harveys had to figure out how to actually transport a ton of tea across the ocean. Their decision to use ocean freight rather than air was in line with how they lived, as good stewards of the Earth. Over time, this has become one of their company's pillars, one that easily distinguishes them from their competition. The company never ships by air, despite the convenience and ease this would undoubtedly allow.

Lovena and Ryan set up shop on their Cortes Island homestead and opened for business with a single product—a 100g bag of loose Rooibos. They sold the tea at local Farmers' Markets, and to restaurants and natural food stores in their area. "I basically pounded the pavement all the way up and down Vancouver Island," says Lovena. "I went from one natural food store to the next, telling our story."

And people responded. From the get-go, it was this personal connection, plus their rock solid company values that attracted customers to Gathering Place products. In addition to their commitment to the environment, the Harveys also

> “We made a decision to never import anything to Canada that would compete with Canadian farmers.”

Harvey family with Wild Mountain Honeybush farmers in South Africa. Credit: Gathering Place Trading Company

stand out for the way they live the term “family business.” Their three children have always been involved in the running of the company. “We bring our kids sourcing with us, we consult them in our decisions, and we rely on their opinions,” says Lovena.

As their product line has grown to include certified organic spices, vanilla, coconut, and more teas, as well as farmer-direct dried fruits and dried Kalamata olives, their founding business decision—to direct source—remains unwavering. They favour certified organic farms, as their company gained certification three years ago, but do consider farms that grow organically but haven’t been able to afford certification. The company never sources from distributors, and goes to great lengths to find just the right family or cooperative farmer to supply their products.

This has meant travelling to South Africa and India, where the bulk of their products are grown. “When we meet with people face-to-face, we immediately get a vibe for the farm and the integrity of the operation,” says Lovena. “We look for strong environmental policies and an amazing product that is harvested carefully.” The Harveys also ensure that workers on-site are being treated and paid fairly.

It was on one of these trips to India that Lovena and Ryan encountered the small-scale cooperative that would end up supplying their company with a whole new spice line. “That was a real turning point for us,” says Lovena. “Having a direct source for spices meant a much higher quality, fresher product, and customers really noticed.”

Lovena explains that with other spice companies or with big grocery chains who use middle men, the spices often sit in the country of origin for more than a year, and upon

Lovena's daughter Asha with a woman farmer and her mother in India. Credit: Gathering Place Trading Company

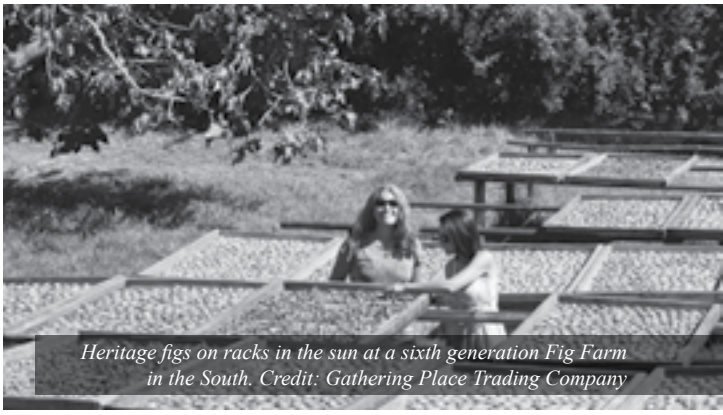
import, might sit in a warehouse for another year. "By the time you buy your spice package, it could already be two years old," she says. "Ours are always the current year's harvest and are very distinct and vibrant in colour."

When the time came to expand their spice line to include a greater array of culinary herbs, the Harveys had a chance to put another of their founding company values to work. "Right from the get-go, we made a decision to never import anything to Canada that would compete with Canadian farmers," says Lovena. In this case, the company could have easily sourced cheap thyme from China or oregano from Turkey, but instead they turned to Canadian organic growers.

After contacting dozens of small operations, they found a multi-generational, certified organic, family farm in Alberta who now grows their thyme, oregano, dill, sage, and basil. Another small farm in Saskatchewan grows the brown and yellow mustard seeds that Gathering Place uses to create a beautiful mustard powder at their packaging facility in Campbell River.

To bring the company values and story full circle, Lovena and Ryan actually grow the rosemary and bay leaves they sell to customers at their home on Cortes Island! "We've had incredible consumer response to these Canadian-grown herbs and spices," Lovena says, noting their sales have doubled in the last year alone.

From a ton of tea garnered through a trade to over 70 tonnes of product shipped annually, the Gathering Place takes their motto, "From Farmer to Family," seriously.



Heritage figs on racks in the sun at a sixth generation Fig Farm in the South. Credit: Gathering Place Trading Company

"We love knowing our farmers and wouldn't have it any other way," says Lovena. She and Ryan also love being able to trust the impeccability of their products for their own family and for all the other families who have come to trust the Gathering Place name.

According to Lovena, the basis of all of their business decisions is simple. "We only bring in foods that we want to feed our family." Full stop.

gatheringplacetrading.com

Renée Hartleib is a professional writer, editor, and writing mentor based out of Halifax. Although she lives in Nova Scotia, Renée visits BC every summer and consider it her second home. To see more of her work, and some of the online writing programs Renée offers, check out her website: www.reneehartleib.ca.

ORGANIC FARMING
TO ENHANCE NATIVE SPECIES

Keith Manders, rancher, helping Okanagan Similkameen Stewardship plant native trees and shrubs to enhance a riparian buffer (along Aeneas Creek) on Garnet Valley Ranch in Summerland, BC. Credit: Okanagan Similkameen Stewardship

By Tanya Brouwer

Agricultural activities are often blamed for the demise of the planet's environmental systems. It is not uncommon to hear about deforestation, drained wetlands, and dying grasslands when referencing agriculture. Yet the Canadian Organic Standard specifically states that "organic agriculture should sustain and enhance the health of soil, plants, animals, humans and the planet as one and indivisible." This puts organic farmers in a unique and invaluable position as environmental stewards of some of the last large tracts of fertile land in the country.

Unfortunately, this noble mandate, while inspirational on paper, lacks the specific steps that organic farmers need to turn this goal into reality. It becomes necessary, then, for organic stewards to first turn inwards and understand the local, biogeoclimatic zone in which they operate. With this understanding, it becomes easier for farmers to recreate or retain habitat elements of the zone's numerous ecosystems in order to bolster often dwindling populations of native species. At the same time, a knowledge of regional ecosystems allows organic operators to minimize farmer/wildlife conflict. The result is a scenario where farmers and wildlife form mutually beneficial relationships.

For example, many of the South Okanagan's organic operations lie within the Bunchgrass biogeoclimatic zone (BG). Very generally speaking, this zone is characterized by moderate winters, hot summers, and very little precipitation. Grasses are the dominant vegetation, interspersed with Rabbitbrush, Big sagebrush, and Antelope brush among others. The wildlife species native to this zone, including birds, bats, mammals, and insects, have evolved with the climate and resultant plant life and rely upon these ecosystems to fulfil certain life cycles. Agricultural plant species, on the other hand, are not part of this coevolution and, alone, can disrupt natural life cycles forcing some native populations to diminish and others to become perceived 'pests'.

BIOGEOCLIMACTIC ZONE

BC is divided into 14 biogeoclimatic zones. Zones are large geographic areas with relatively uniform climate. They are named after 1, 2, or 3 of the dominant climax species. Spruce-Willow-Birch, Mountain Hemlock and Coastal Douglas-fir are some examples. Other provinces use different classification systems.

The good news: it is possible for organic farmers to coexist with native systems within the farmed environment without decreasing production goals. For instance, the South Okanagan is home to many snakes. The rattlesnake and gopher snake are some of the most well-known and misunderstood. Through persecution and habitat loss their numbers have dropped significantly. What many farmers fail to realize is that snakes, protected under the BC Wildlife Act, are an organic farmer's friend for effective and 'approved' rodent control, so populations should be encouraged in a safe manner.

In the South Okanagan, rocky slopes are often used as denning sites. These should be maintained with a buffer of natural habitat. In order to prevent farmer/snake conflict, habitat hiding spots like piles of rocks or wooden boards can be created and placed away from busy work areas. If all else fails and conflict cannot be avoided, particularly with rattlesnakes, a farmer may opt to install snake barrier fencing.

Wetlands are also a vital element of the dry BG zone and support at-risk species like the Blotched tiger salamander and the Great Basin spadefoot toad. Healthy wetlands help farmers by reducing mosquito populations, recharging aquifers, and minimizing flooding to non-wetland areas.

Continued on page 19....

BREAKING NEW GROUND
Foodlands Cooperative of BC

The Lohbrunner Farm crew with their garden hoophouse. Credit: Michael Marrapese

By Michael Marrapese

Spring is often a time of optimism and renewed expectations. This will be Ariella Falkowski's first year breaking ground for her new Sweet Acres Farm.She is leasing two acres of land at Lohbrunner Community Farm Cooperative on the outskirts of Langford, BC. She's still getting to know the land and is excited by its potential. "It's been really busy," she says, "but some parts of the field dried up fairly early so I've been able to get crops in the ground earlier than I expected. My two projects this month are to finish putting up my hoop house structure and installing the drip irrigation."

The Lohbrunner Farm is also home to Vitality Farm. Farmer Diana Brubaker and her husband Doug have been growing market vegetables on the property since 2012. When Brubaker first arrived on the property it was held in trust by the Land Conservancy of British Columbia (TLC). Norma Lohbrunner had wanted the 40 acre property with its rich peat soil and rolling wooded hills to be preserved as a working farm and wildlife sanctuary. Brubaker and a group of community volunteers signed on to maintain and enhance the existing crop beds and berry bushes after Norma Lohbrunner died in 2011. However, TLC was facing financial difficulties and the fate of the farm was uncertain. There were hopes that TLC would still function in some manner and that the group of fledgling farmers could arrange to lease the seven acres they were hoping to farm. "We tried for about four years but it just didn't happen. Our second option was to buy it," Brubaker explains. "We were trying to develop a co-op and buy the property. TLC couldn't do that because they were in the courts trying to resolve their difficulties."

Unfortunately, the process ended up with a court order to put the Lohbrunner Farm and other properties up for sale in order to cover some of TLC's funding shortfalls. Brubaker and her farming group had to scramble to find another option. "The last option for us was to look for someone to transfer the land to who could hold it as a farm for eternity. That was our main drive: how do we keep this farm as a farm forever."

The group turned to the newly formed Foodlands Cooperative of BC (FLCBC). FLCBC's visionary mandate is specifically to hold farmland in trust and ensure that it is actively farmed, managed by a community group, and accessible to the broader community. Heather Pritchard, the co-op developer with FLCBC, notes the process of devel-

Ariella Falkowski with her walk-behind tractor. Credit: Diana Brubaker

Celebrating the Fall harvest. Credit: Michael Marrapese

oping Lohbrunner Cooperative and taking a farm in trust is new ground for all involved. "The leases, agreements, governance processes, and Cooperative structure of Lohbrunner are essentially the template for how other farmlands can be held in trust," she says. "The lessons learned from Lohbrunner Community Farm will be the basis for other lands held by the Foodlands Cooperative."

However, FLCBC hadn't finished incorporating and couldn't act quickly enough to take the Lohbrunner lands into trust. Pritchard met with funders and stakeholders and arranged to secure the funding and have FarmFolk CityFolk hold the title until FLCBC had fully incorporated and secured charitable status.

Brubaker recalls that, even though the farm had been secured, the co-op members at Lohbrunner soon realized there was still much to be done. The governance and management structure, the co-op's constitution and by-laws, and core operating agreements all had to be worked out. "The Foodlands Cooperative has been so supportive in helping us establish our own co-op. It's given us lots of flexibility to design something that works for us. It's truly incredible to be in this place of options and choices. We're extremely blessed," she says.

While cooperative ownership can be challenging, it has big benefits, particularly when starting a new enterprise. Principally, with the high cost of farmland, pooling personal and community resources can be one avenue to secure financing. Falkowski notes that there are other practical benefits. "One of the things that initially drew me to leasing land at Lohbrunner was the opportunity to have a more stable long-term lease. Another benefit is that we have really helpful co-op members with really different skill sets. Different people have different experience and different connections that they can bring to the table."

One of the current challenges is securing organic certification. As it turns out, the unusual ownership model has made organic certification more difficult. Initially, the Islands Organics Producers Association (IOPA) was suggesting an incubator farm model but it just didn't fit. Brubaker reflects that, "the problem seems to be that we're the 'square pegs that don't fit into their round holes'. I really liked the idea an incubator farm model where a new farmer, who doesn't necessarily have the skills, could be mentored to help them get started. However, when they wanted to move on, they couldn't take that certification with them—they'd have to start over again."

Falkowski was involved in a lot of back and forth discussions. She recalls that, "what seemed to make the most sense for Lohbrunner was to certify as three different entities—as Vitality Farm, Sweet Acres Farm, and Lohbrunner

Diana Brubaker working in the field while her dog, Bella, supervises. Credit: Ariella Falkowski

Community Farm. One of the benefits of doing it this way is that if I were to leave the property or to lease some additional land elsewhere, my certification number would go with me."

The downside to this process is that each certification will cost $500. "Using this approach we now may have to pay $1500 a year to be certified," Brubaker says. "At this point, I'm not sure there's enough revenue off the farm to justify the expense." The further implication is that when other farmers come onto the property the costs could rise to $2000 or $2500 a year.

Brubaker also finds the certification process particularly arduous for their diverse market vegetable operation. She has many different inputs for the different crops. Chief among them are all the different seeds she purchases—three to four hundred different seeds from different catalogues. "I'll have to detail why I choose one over the other and whether they are organic or not. If we were just growing one or two crops it would be far less work."

Despite the difficulties, Brubaker asserts that the certification process has been valuable for her. "As part of my professional career as a leader in health care one of my roles was quality improvement. When I apply those similar principles to the certification process I appreciate that it is a really good process to go through. I look differently now at everything I buy, everything I bring to the farm. I think that, in the beginning, we had the very basic principles of organic farming but this process has taken us a step further."

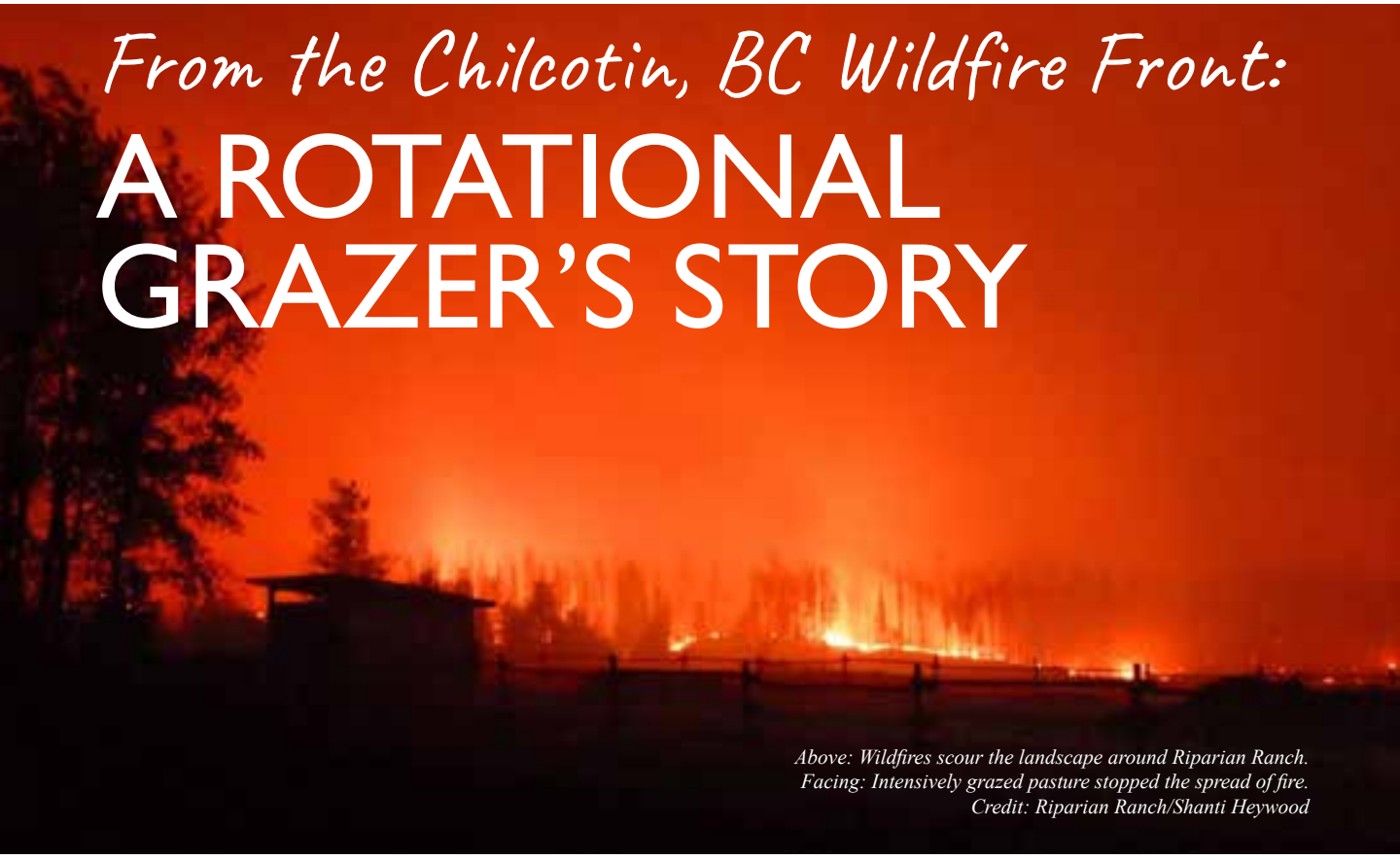
Trying new processes and new approaches, breaking new ground, is difficult but in the spring, the season of optimism, it seems possible. "It's not going to be easy," she says, "and there are lots of unknowns. We're hoping this year has more laughter and hugs than tears."

foodlands.org

lohbrunnercommunityfarm.org

sweetacresfarm.ca

Michael Marrapese is the IT and Communications Manager at FarmFolk CityFolk. He lives and works at Fraser Common Farm Cooperative, one of BC's longest running cooperative farms, and is an avid photographer, singer and cook.



From the Chilcotin, BC Wildfire Front:

A ROTATIONAL GRAZER'S STORY

Above: Wildfires scour the landscape around Riparian Ranch. Facing: Intensively grazed pasture stopped the spread of fire. Credit: Riparian Ranch/Shanti Heywood

By Shanti Heywood

This story first appeared on the Young Agrarians website: youngagrarians.org.

Protecting my home was just something I had to do. People keep commenting on how brave I was—but I like to think everyone has some grit inside of them somewhere to fight when they have to. My heart goes out to those who have lost their homes and those who are still fighting to save homes.

We bought 256 acres of cleared but poor quality (and consequently, affordable) land out in the middle of nowhere. My husband wanted to live off the grid and I grew up off grid, so it wasn't a huge stretch buying this place. With technology these days we have a lot more creature comforts available off grid than I did as a kid in the '90s.

The only catch was my hubby has a company down in Burnaby so I'm up here by myself 90% of the time learning to do a lot of things I never dreamed I'd be doing. Since the land needed improving and was not fenced we bought some solar powered fencers and step in posts and got to work. With affordable solar fencers, the voltage isn't that much, so you really have to work with the psychology of the animals. If they're not satisfied they will just leave. Solar fencers definitely let you know if your animals are happy in a hurry.

I moved them last year every 24 to 48 hours, and I saw a good deal of improvement. This year we dedicated a lot of time to fencing. I would only move them once per week but it still did what it was supposed to do.

The forage stayed green a lot longer than the ungrazed areas despite extreme drought conditions. Once the fire started I kind of knew we were in a good spot. Some of my friends, bless their hearts, were heavily involved in helping people evacuate livestock. They were quite insistent that I should get my animals out of there, but I refused. They're as much my coworkers as they are livestock and they had as much of a job to do during the fire prep as I did.

I put my cows and horses in the hay field (the only area that had not yet been grazed...lots of fuel growing in peat soil) and started to move the step in posts closer to the forest every time they had finished a section. The fire danced around me for a month and finally made a pretty decisive b-line for me. Once the fire started to come I moved the posts back to the grazed area so they wouldn't burn and set up a second water source in case the first source had fire near it. I moved the animals' loose mineral tub back to where I thought was safest so they knew that was the best area to hang out, and that was that.

We watched the fire come in on all sides in one wild night. There's no way I can describe the power of this fire so I'll

just give a rundown of what happened. August 11—I kind of knew it was the day the fire would come. Five weeks of waiting, watching, and preparing. That morning I got my chores done early and headed inside for a nap. I woke up in the afternoon to roaring fire on three sides and hot—I mean HOT—wind.

My neighbours Becca and Darrel showed up not long after. Darrel was worried about a cabin in the woods, Mikey's cabin, and wanted to go check that the pump was still running. He went one way and Becca and I went the other way to break a dam upstream to let more water in to the creek for Mikey's pump. There we are, two girls sitting in the mud listening to the roar of the fire behind us. Once we started heading back we quickly realized the fire was already almost at my property and became pretty worried about Darrel. He never made it to Mikey's pump because the fire was already in the surrounding forest. We all figured the cabin was a pile of ash.

Another neighbour, Robert, showed up at that point, as did the one and only guy we had ever seen from Quesnel (who is supposed to be managing this fire). He quickly left. There wasn't much we could do. We stood and watched the flames come in on all sides, completely surrounding us and cutting off all exits.

Once the fire had come in close I turned the waterfowl and billy goat loose and went in to the field that the goats and dogs were in. I called them all out of their huts as I was worried the roofs might catch a spark and led them to the sprinklers. They seemed to understand what I was showing them, as they never walked back in to their huts that night. I was not concerned about the cows and horses out in the hay field. We do managed intensive grazing, which proved very effective at stopping the fire in its tracks. I was pretty confident they were completely safe.

Then the smoke came down on us and for most of the evening we were choking on smoke and couldn't see a thing. We had a couple little hot spots in paddocks and pastures throughout the night but they either burnt themselves out or were put out.

About midnight the fire calmed down on the Northern side and much to our surprise we heard the buzz of Mikey's pump in the distance—the cabin had survived. The water from the dam had finally made its way down to us so we used it to put out a few fires and wet certain areas down. At the end of the night we all stood in awe of what had happened and what was still going on. Robert cut his way through my driveway to get home and we headed to bed. Darrel stayed up to keep watch.

The next day my husband finally was able to make it home and the fire ripped through two of our neighbour's properties (they both made it). We weren't able to be there for

Horse and cows happy to be safe and sound!
Credit: Riparian Ranch/Shanti Heywood

either of them but we cut our way through and went to help as soon as we could. Later that evening Robert's wife Mamie said, "Who's even going to believe this? Two people in their mid '60s running around with hoses fighting a wildfire."

The fire burnt right up to where they had grazed and stopped. It was very hot and burnt pretty much anything in its path including green marshes and willow bushes. In one spot where I had just grazed but didn't move the posts back to the grazed area the fire actually burnt the hot tape but not the posts because the cows had reached under and grazed around them.

Peat soil is quite notorious for burning underground for months...even through the winter...but for whatever reason the field appears to be just fine. My poor neighbour who owns another part of this field about two km away is still battling underground hot spots in his peat soil and he had the fire pass through one day after me. We've been over a few times to help him put out spots and move hay.

We have major wolf problems in the winter so fencing and LGDs (livestock guard dogs) are actually more important than this fire ever was. I shocked the heck out of the structure protection crew when I told them my puppies in training were more important than their hoses and I would NOT move them out of their field. Never a dull moment around here.

None of us are able to get fire insurance due to our remote off the grid locations, so of course we all stayed to fight. We have been spending every day since checking on the properties and putting out little hot spots. It won't be something I will ever forget, nor will this area ever look the same within my lifetime.

In the end, we didn't lose anything to the fire. There's no damage other than a few singed fence posts and of course my canoe I forgot about until we had gone to break the beaver dam when the fire was here. All the prep I did made it a fairly easy experience and the people that stayed with me of course helped immensely. I was never very good at studying for tests in school but this one I feel like I did my homework and was pretty well prepared for.

The fire is still blazing to the East of me. I can see plumes of smoke rising as I type this but for the most part we are safe. It's never a dull moment here but I think it is safe to say this was one of the most exciting.

facebook.com/riparianranch

Shanti Heywood manages Riparian Ranch, an off grid ranch in the Chilcotin working towards providing humanely raised meat and livestock in the most natural and peaceful setting possible.

Native Species, continued from page 11....

With over 85% of the Okanagan's wetlands destroyed, farmers would be wise to protect them. Ensuring organic fungicides are applied on low wind days avoids negatively impacting amphibians. Exclusion fencing is a good first step for livestock operators and appropriate buffers with native plantings are also recommended in non-livestock settings. Wetland re-creation is another option in fields where wetlands have been drained.

Admittedly, many organic farmers, particularly those growing fruit, might be hard pressed to find room for a relationship with birds. Many birds, however, are voracious eaters of insects that are also detrimental to fruit crops. And, like other native species, numerous populations of native birds are on the decline due to human related habitat loss and competition from non-native species like the European starling. For these reasons, the Lewis's woodpecker, found in the South Okanagan, is considered threatened. To encourage its comeback, large standing dead or live Ponderosa pine or Cottonwood trees should remain intact as they provide important habitat for this species (BOX). Ensuring that vineyard netting is tight and not hanging loosely will prevent stolen grapes and inadvertent bird catch. As a final incentive, Lewis's woodpeckers, like all migratory birds, are protected under the federal Migratory Birds Convention Act so meddling with this species and many others is considered illegal.

Of course, the tiny but mighty native pollinators should not be forgotten. Native species of bees, flies, moths, butterflies, and beetles are responsible for one of every three bites of food we take. Unfortunately, many of these populations are also on the decline. This is where native plants are especially important. In the South Okanagan, for example, the Mining bee is the first to emerge in the spring and benefits from Yarrow's early bloom. As another example, the female Northern Checkerspot will lay her eggs on the underside of Rabbitbrush leaves. By planting a hedgerow or strip of native plants (or maintaining existing native habitat), organic farmers will help preserve species that are vital to crop success.

Obviously, many of these projects require some financial input. Additionally, learning this information requires time that many organic farmers simply do not have. Several communities and regions have stewardship societies with experts that will assist farmers in identifying critical habitat on their property. These groups are also aware of potential grants and other funding that can help fulfil conservation goals. Okanagan Similkameen Stewardship, Delta Farmland and Wildlife Trust, the Kootenay Conservation Program, the GOERT society on Vancouver Island, and the Environmental Farm Plan are great regional programs that farmers can access.

At the end of the day, organic farmers are also ecologists, managing the interrelationships of soil, water, plants, and animals to create a thriving, healthy operation. While the specific knowledge of local ecosystems may be new to some, it is likely that the nurturing of these ecosystem elements is a long time practice for many. Learning the details of a region's biogeoclimatic zone is an extra step that will ensure the organic farmer is well on the way to fulfilling the organic standard's mandate to protect Canada's environment.

Tanya Brouwers is the Ecostudies coordinator for the Okanagan Similkameen Conservation Alliance. She also is an organic verification officer and a farmer. For any questions related to this article or to book a workshop, email her at ecostudies@osca.org.

WILDLIFE PROTECTION

BC Wildlife Act: protects virtually all vertebrates from direct harm, except as allowed by regulations (e.g. hunting). Anyone who kills or harms an endangered or threated species can be fined $500,000 and three years in jail.

Migratory Birds Convention Act: federal legislation that protects all of Canada's migratory birds, including their nests and eggs, unless allowed by regulations.

Large standing dead or live trees that provide valuable habitat for the conservation of wildlife are referred to as Wildlife Trees.

CELEBRATING

The Flight of the Bumblebee

Photo: *Bombus Impatiens*. Credit: Katja Schulz

By Marjorie Harris BSc, IOIA V.O. P.Ag

When I think of the 'wholeness' of a bioregional ecosystem and imagine the inner workings to identify which biological organisms could have the greatest influence on the entire system, nothing seems to compete with the influential power of the domesticated honey bee.

This industrious pollinator flies great distances to gather nectar and pollen. The Canadian Organic Standards (COS) Clause 7.1.10 recognizes the prodigious flying capacity of the honey bee by requiring apiaries to be protected by a three kilometre buffer zone from pesticides, GMO crops, sewage sludge, and other environmental contaminants. I decided to calculate just how big of an area a three kilometre radius would cover—an astounding 28.27 square kilometers! Wow! The domesticated honey bee's influence in a bioregion extends over a huge pollination territory.

To further visualize how big 28.27 km^2 is geographically I used Google Earth Pro to draw the three kilometre radius circle on the map. The immensity of the area over which one hive of honey bees has direct pollination influence is amazing to witness. I recommend that the reader draw a similar diagram over the home-farm—you will be surprised at how much area is actually covered. It is definitely an eye-opener and explains in a very visual way why relatively few organic operations can qualify as organic apiaries.

RELATED ORGANIC REGULATIONS

CAN/CGSB-32.310 7.1.10 *Location of hives Where sources or zones of prohibited substances are present, that is, genetically engineered crops or environmental contamination, apiaries shall be protected with a buffer zone of 3 km (1.875 mi.).*

CAN/CGSB-32.310 7.1.7 *When bees are placed in wild areas, impact on the indigenous insect population shall be considered.*

Photo: Frisky bumblebee. Credit: Gilles Gonthier

In stark contrast to the honey bee's huge domain is the relatively small realm of influence the humble bumble bee commands. There are well over 450 native bee species in British Columbia and 45 of those are bumble bees.

The bumble bee is the only other social bee that makes honey. Bumble bee colonies are very small containing between 50 to 200 bees. Seventy percent of the colonies are formed by ground nesters, while others nest in cavities of dead wood or pithy stems.

Brown-belted Bumble Bee (Bombus griseocollis). Credit: Andrew C

"There are well over 450 native bee species in British Columbia and 45 of those are bumble bees."

The average bumble bee species will only travel 100 to 200 m from the home nest to collect nectar and pollen. The average domain of pollination influence for a bumble bee is between 0.031 km^2 and 0.13 km^2. Putting this all into perspective, for each honey bee colony's influence domain of 28.27 km^2 there could be between 200 to 900 humble bumble bee ground nesting colonies competing for many of the same nectar and pollen resources!

The good news for bumble bees is that many of them are specially designed to harvest nectar and pollen from native flowers that honey bees can't access. The bad news is that native bee populations are in decline due to loss of native foraging habitat, pesticides, and mechanized farming destroying nests by tilling the soil.

Social bee colonies form 'super organisms,' with all individuals working for one home. The honey bee's 'super organism' even exceeds in bioregional influence the largest organism on planet Earth, a honey fungus that extends its reach over 10.36 km^2 of the Malheur National Forest in the Blue Mountains of Oregon. Honey fungus is a plant parasite that manages its domain by selecting which plants live within its territory. The fertilization by pollination of plants by the bee has a similar selection effect on the ecosystem. By geographic area, one domestic honeybee hive has three times the bioregional influence of the largest organism on earth.

COS clause 7.1.7 recognizes that imported domestic honey bees have an impact on the indigenous insect populations. I would say that even though the vast majority of farmers cannot qualify to produce organic honey themselves, it should be recognized that the conventional production of honey is having a major impact on our native pollinators. Taking the lead from clause 7.1.7, we can conscientiously strive to protect and provide forage habitat and safe nesting sites for the humble bumble bee and other native pollinators.

By providing forage habitat and safe nesting sites for bumble bees, we are having a direct influence on the health and wealth of our home bioregional ecosystem. As an environmentally conscious and active community, we can have a positive impact in our bioregion by providing for our indigenous insect pollinators as we mobilize ourselves to address the environmental needs of these indigenous insects.

There are so many delicious wild berries that need the bumble bee. The flowers on these berries are enclosed so it takes a bumble bee's specialized long "tongue" to get to the plant's nectar. As the bumble bee 'buzzes' on these flowers the muscles it uses for flying releases the flower pollen and sticks to its long body bristles to be transferred to other flowers.

Buffer zones are an excellent starting place to plant native vegetation, trees, shrubs, and flowers that will become oases of survival for the humble bumble bees.

If you need further inspiration, think about the near extinction of the native bee pollinator for the vanilla orchid, which produces vanilla beans, the shiny green orchid bee. All commercial vanilla bean operations must now employ hand pollination!

Another shocker in the news is that Walmart and other interested corporations have been patenting designs for robotic pollinators. I'd rather keep the robots out of the pollination equation, especially since we can set aside buffer zones and wild areas and gradually restore unfragmented sections of land devoted to a wide diversity of native pollinator vegetation, undisturbed nesting locations, and overwintering sites for bumble bee queens.

Check out the link below for a library of seasonal listings for pollinator plants to build your pollinator gardens. Celebrate the amazing bumble bee!

seeds.ca/pollinator/plant_canada/index.php

Marjorie Harris is an organophyte, agrologist, consultant, and verification officer in BC. She offers organic nutrient consulting and verification services supporting natural systems.

A NEW MODEL FOR INTEGRATED HABITAT DEVELOPMENT
For Bees, Birds, and Fish (IEHD-BBF)

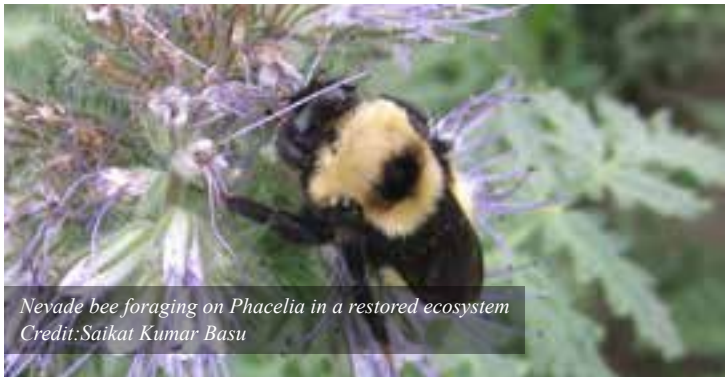
Pollinator sanctuaries can help establish small ecological units over time. Credit: Saikat Kumar Basu

By Saikat Kumar Basu

Global bee populations are showing an alarming decline due to a number of factors like environmental pollution, indiscriminate use and over applications of various agro-chemicals, industrial agricultural practices detrimental to nature, changes in the land use patterns, and parasitic diseases of bees as well as lack of adequate supply of nectar and pollens for different bee species due to lack of suitable of bee foraging plants and natural melliferous flora. The challenges are not just restricted to honey bees and/or native bee species, but also to other insect pollinators such as moths, butterflies, and certain species of pollinator-friendly flies and beetles. Under these circumstances it is important to conserve the endangered bee species and other pollinator insects, mollusks (snails and slugs), birds (certain humming bird species), and mammals (bats) helping in the process of natural cross pollination.

A large number of global food and industrial/commercial crops, forage crops, wildflowers, ornamentals, vegetables, and forest species are dependent on biological agents or vectors of cross pollination for their successful reproduction and survival. The yield loss due to lack of

A Stratiomyid fly foraging on a wild chamomile flower. Credit:Saikat Kumar Basu

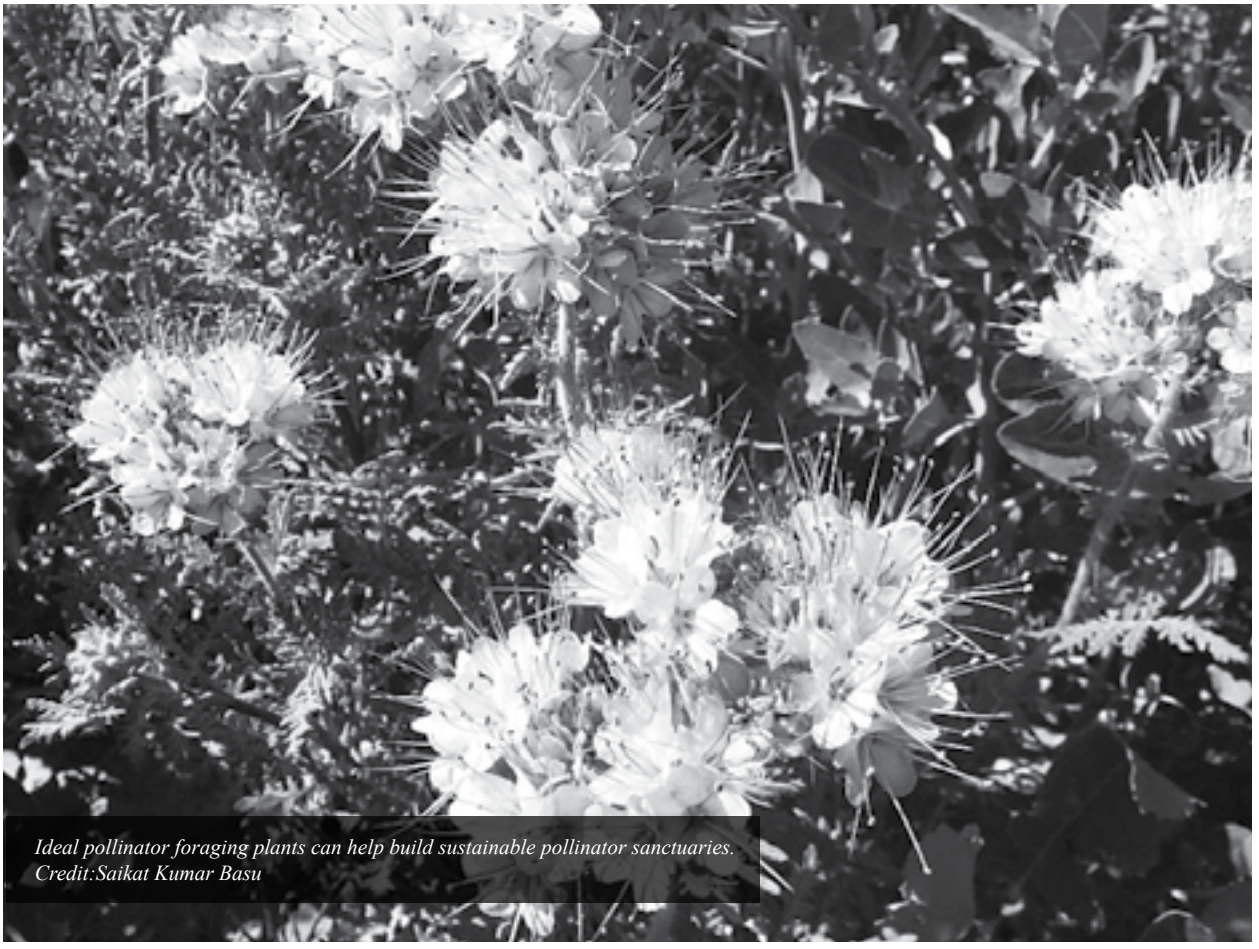


Nevade bee foraging on Phacelia in a restored ecosystem Credit:Saikat Kumar Basu

Aquatic habitat integrated with pollinator coservation can provide multi level species protection for bees, birds, and fish. Credit Saikat Kumar Basu

suitable pollinators for cross pollination is a serious threat to the future of global agriculture as well as for maintaining the balance of our natural ecosystems. Loss of honey bees are having detrimental socio-economic impacts on the apiculture industry; and thereby impacting the livelihood and social security of millions of individuals around the planet.

Establishing suitable pollinator (bee) gardens or habitats or sanctuaries at suitable sites could prove to be instrumental in both bee and other pollinator insect conservation from a long term, ecological perspective. Using suitable pollinator mixes comprising of native grasses, wildflowers



Ideal pollinator foraging plants can help build sustainable pollinator sanctuaries. Credit:Saikat Kumar Basu

as well as annual, biennial, perennial forage crops (forage grasses, legumes, different Brassica family members) can help in establishing pollinator gardens, habitats, or sanctuaries in perimeters of forested areas, under used or unsuitable agronomic lands, unused and available rural locations, city and municipal parks and gardens, lawns, kitchen gardens, unused or hard to farm areas, in sites adjacent to natural or artificial waterbodies like ponds, pools, ditches, swamps, bogs, streams, or irrigation canals.

Aquatic Habitats

Freshwater wetland habitats need to be protected to conserve the aquatic ecosystems, the rich biodiversity associated with itand to protect nature for our future generations. Protecting freshwater wetlands does not necessarily require huge expertise, funding, or high levels of technology applications, but rather. simple innovation, creativity, awareness, and the desire to develop comprehensive multi-layer conservation strategy in the line of Multiple Tier Conservation Model (MTCM). A well managed and carefully planned freshwater aquatic habitat conservation strategy could be establishing Integrated Ecological Habitat Development for Bees, Birds and Fishes (IEHD-BBF). This proposed model targets multiple trophic levels within a dynamic natural or artificial freshwater ecosystem to conserve multiple species simultaneously.

Natural or artificial aquatic habitats like pools, ponds, ditches, swamps, bogs, lakes, canals, etc… could be targeted for ecological restoration by planting short or high grasses, salt tolerant aquatic plant species, and grasses along with pollinator mixes comprising of annual and/or perennial legumes, wildflowers, and related pollinator friendly plant species or melliferous flora around target fresh water habitats. Such mixes will not only restore aquatic habitats, but also attract small and medium sized land birds and a wide diversity of pollinator insects like honey bees, native bees, moths, butterflies, certain species of pollinator beetles, and flies for nectar foraging, nesting, and breeding purposes.

From Flora to Fauna

If the waterbodies are well stocked with indigenous fish species, well protected grassy aquatic habitats will also attract a wide diversity of aquatic birds to nest, forage, and breed in such unique environmentally restored ecosystems. An integrated Bees, Birds and Fishes Conservation Model (BBFCM) can be extremely useful in protecting multiple species at the same time and location.

Grasses in the mixes can help in soil erosion and restoration, as well as phytoremediation, while legumes will enrich the soil with natural nitrogen resources without application of any synthetic fertilizers. Care must be taken

to avoid using any pesticides in such habitats to prevent chemical pollution. Over time, such aquatic habitats will also attract local wildflowers and aquatic plants to grow and thrive in these ecosystems attractive to various species of both terrestrial and aquatic insects including active pollinators, along with small to medium sized terrestrial and aquatic birds to nest and forage in such restored aquatic habitats. Well stocked waterbodies with native fish species will promote native fish conservation and at the same time provide a stable food source for a number of aquatic birds.

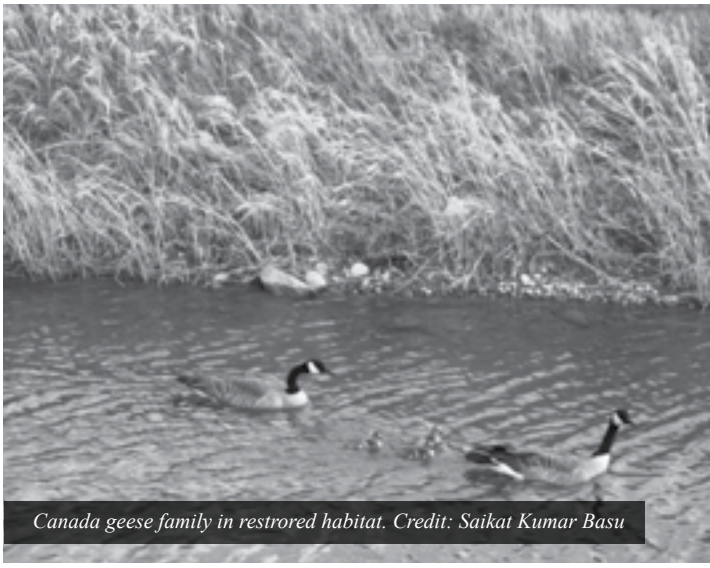
Small and medium sized mammals, reptiles, and amphibians will also be able to establish in such ecosystem utilizing the growing complex food chains and food webs over time. Overall, the innovative and multi-trophic level Integrated Ecological Habitat Development for Bees, Birds and Fishes (IEHD-BBF) model has huge potential for restoration and reestablishment of natural and artificial aquatic ecosystems with minimal care, attention, management and funding. Such ecological restoration using the IEHD-BBF model can serve the needs of dwindling bees and insect pollinator populations, along with local resident and migratory birds and indigenous fishes to successfully multiply in an integrated multi-species catering dynamic ecological system.

Regionally Specific Ecological Restoration

It is important however to note that plant yield and adaptation varies according to different ecosystems and agro-climatic conditions. It is also important to note that plants exhibit a strong Genotype X Environment interaction (G X E or GE effect). As a consequence, it is not advisable to use same pollinator mix at different locations and habitats for integrated habitat development. Locally adapted biodiverse pollinator mix selected through multi-location trials under varied geographical, geological, ecological, and climatic variations across different latitudes needs to be seriously evaluated for optimal results. Locally adapted pollinator mix with their unique combination of diverse species suited and adapted for individual agro-climatic and ecosystem regions has the potential to yield optimal results.

The flowering periods of the components of the pollinator mix need to be thoroughly investigated and tested against specific environment to evaluate what diversity of natural insect pollinators they are attracting and how well the plants included in the pollinator mix are adapting to the local parameters, withstanding competition against local weeds under field conditions. It will be important to identify the plant species that are performing best under natural conditions at different agro-climatic conditions with respect to establishment, regeneration, and attracting natural insect pollinators. If judicious selection of appropriate plant species is made with local adaptation to agro-climatic variability across different families; and with different flowering period; the resultant pollinator mix will be more suitable and yield optimal results in protecting and conserving pollinators as well as help is establishment or restoration of natural ecosystems.

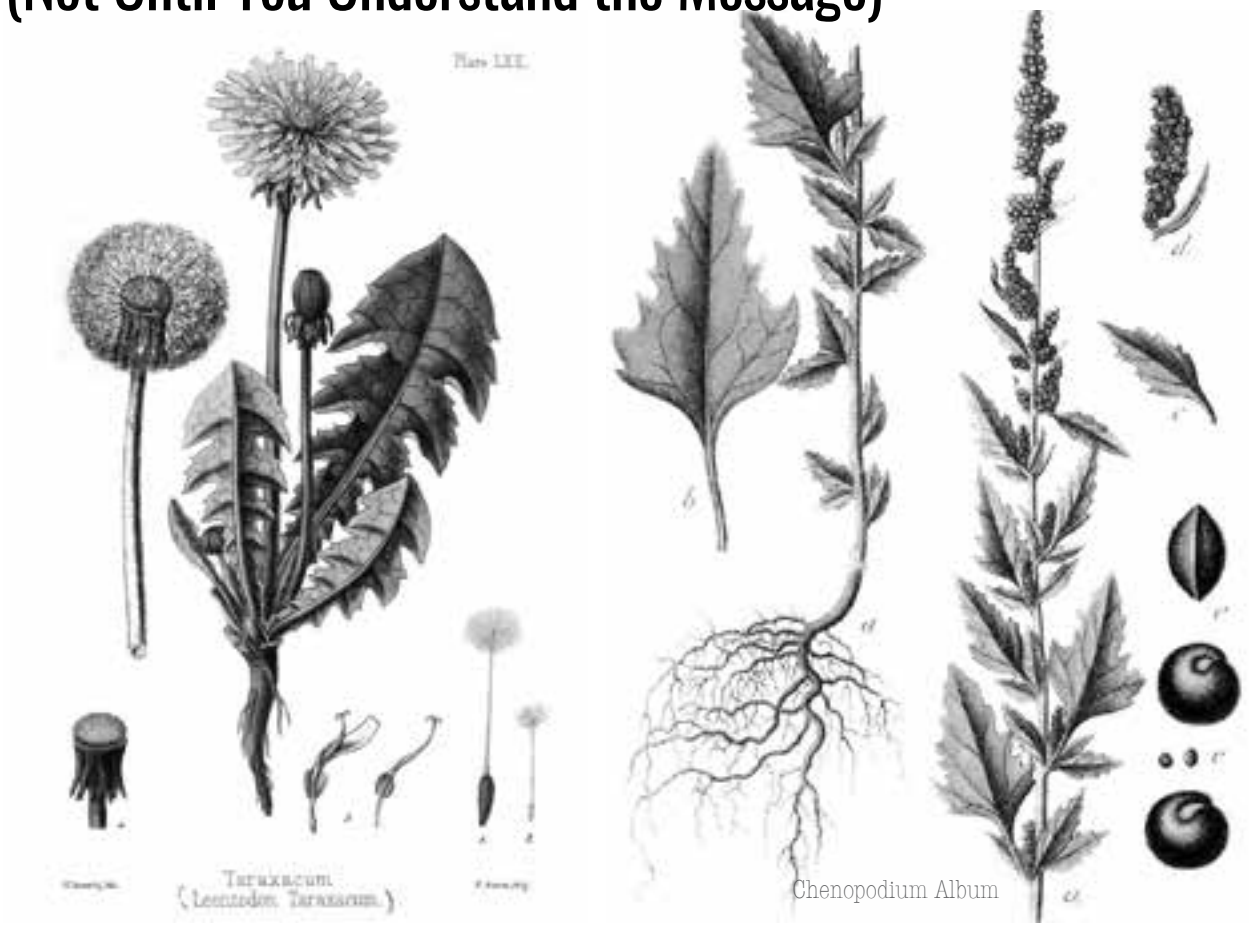
Saikat Kumar Basu has a Masters in Plant Sciences and Agricultural Studies. He loves writing, traveling, and photography during his leisure and is passionate about nature and conservation.



Canada geese family in restrored habitat. Credit: Saikat Kumar Basu

Bee foraging on sainfoin flower. Credit:Saikat Kumar Basu

WEEDS:
Don't Shoot the Messenger
(Not Until You Understand the Message)



By Av Singh

Originally published in The Canadian Organic Grower, with thanks.

All too often when farmers start talking weeds, a common first question is "How do I get rid of a bad case of…?" when a more appropriate question is "I wonder why my field has a bad case of…?"

The subtle difference in the above question requires a surprisingly dramatic paradigm shift in your view of weeds. Weeds must shed their role as problems, pests, and sources of frustration, and instead take on the role of symptoms, storytellers, and healers. Weed advocates consider weeds as plants with a mission and look to learn what the weeds can tell us about our soil conditions (e.g. pH, drainage, compaction, etc.) or our management practices (e.g. crop rotation, row spacing, stocking rate, tillage, etc.).

Weeds Redefined

Nicolas Lampkin, in Organic Farming, stresses that it is the human activity of agriculture that generates weeds. He defines a weed as "any plant adapted to man-made habitats and interferes with human activities." For weed spin doctors, even that definition is too harsh because it focuses too much on the negative. The first step in our weed propaganda is to begin viewing the appearance of weeds as beneficial.

We are all familiar with the saying nature abhors a vacuum. Well, cultivation essentially creates a vacuum where whole communities of plant and soil life are disrupted and/or destroyed. Nature responds with weeds. Within days, pioneer plants such as pigweed, lamb's quarters, and purslane grow rapidly and thickly. They anchor the soil and generate organic matter that feeds the soil life. These fast-growing annuals also provide shade, hold moisture, and moderate soil temperatures that allow other plants, such as biennials and perennials (including grasses), to initiate growth. If left for another season, this land will have fewer fast-growing annuals and favour later successional plants.

In our fields, the soil is in an unnatural state of continuous disturbance and as a result we primarily deal with the early colonists. Most of these fast-growing annuals grow without associated mycorrhizal fungi (primarily because their life cycle is too short to benefit from a symbiotic partnership). Expectedly, soils rich with mycorrhizal fungi (e.g. pastures, forest floors, agricultural soils rich in organic matter, especially through the use of compost) have fewer annual weeds. Elaine Ingham of Soil Foodweb Inc. suggests that the presence of the fungi serves as a signal that keeps annual weeds from germinating.

Learning From Your Weeds

Now that we better appreciate why weeds appear in our farms and gardens, we can take a closer look at how we can use weeds as indicators for our soil conditions. It is important to note that many weeds can tolerate a wide range of conditions and therefore the appearance of a few individual weeds are not necessarily proof of an underlying soil condition. For example, both perennial sow thistle and dock indicate poor drainage, but dock prefers more acidic soils, while thistle favours a higher pH. You can however learn about the conditions if the weed population is dominated by several species that all prefer similar conditions. For example, if plantain, coltsfoot and ox-eye daisies are the predominant weeds, this could indicate that the soils are waterlogged or have poor drainage.

Agricultural practices such as cultivation, fertilization and grazing management can have a great impact on the soil and, in turn, on the appearance of particular weed species. Frequent tillage will disturb the billions of viable seeds in the soil seed bank and, with sunlight, these will germinate and occupy bare soil. Weeds such as lamb's quarters and redroot pigweed can produce 75,000 to 130,000 seeds per plant (respectively), which can remain viable in the soil for up to 40 years.

The presence of legumes, such as vetch, medic and clover, may suggest that the soil is lacking nitrogen. In contrast, weeds growing on the same soil that appear pale yellow

and/or stunted also indicate low fertility. Overgrazing of pastures may lead to compacted soils and then the presence of perennial bluegrass species and bentgrasses may predominate.

The lack or imbalance of calcium can allow soils to become compacted and without the proper biology in the soil (fungi in the case of calcium), calcium will not stay in the soil.

Soil pH

In addition to helping protect and improve the organic matter content of the soil, weeds can also indicate the acidity or alkalinity of the soil. Most agricultural crops do best in a slightly acidic soil (pH of 6 to 6.5). An increasing presence of weeds such as plantain, sorrel or dandelion may suggest that the pH is dropping below a desirable level. However, having acidic soils should not be viewed as detrimental. Much of Albrecht's work highlighted that poor plant performance on low pH soils was in fact a consequence of low soil fertility or an imbalance of soil nutrients, rather than soil pH. For example, many alfalfa growers have witnessed a dramatic invasion of dandelions after spreading high levels of potash. Essentially, the potash had suppressed calcium levels in the soil. The deep-rooted dandelion scavenges calcium from lower depths and upon its death released the calcium at the soil surface. The appearance of dandelions may be interpreted as indicating acidic soils when in fact the ratio of calcium to potassium caused their appearance.

Extreme Weed Makeover: Look for the Positive in Weeds

- Weeds can act as a green manure or cover crop.
- Weeds can serve to cycle nutrients from the subsoil (e.g. deeprooted weeds such as dandelions or burdock).
- Deep-rooted weeds can break up hard pans, thereby regulating water movement in the soil.
- Weeds can conserve soil moisture.
- Weeds can provide habitat for beneficial organisms.

An imbalance of magnesium relative to calcium can lead to tight soils and eventually anaerobic conditions. Calcium causes soil particles to move apart, providing good aeration and drainage; fungi help to prevent the leaching of calcium out of the soil. Magnesium makes particles stick together and if soils become too tight, oxygen becomes limited and beneficial forms of soil life disappear. In such conditions, organic residues in the soil do not decay properly, and increased carbon dioxide in the soil favours fermentation of the organic matter, resulting in byproducts such as alcohol and formaldehyde. These substances inhibit root penetration as well as create favourable conditions for soil diseases such as pythium and phytophora. Fermentation can also create methane gas which is conducive to the appearance of velvetleaf, or ethane gas which helps jimsonweed to prosper. Grasses with their fine and numerous roots attempt to break up tight soils, while the presence of many grassy weeds may indicate tight soils.

Mycorrhiza is a symbiotic association between fungi and plant roots. Most agricultural crops depend on, or benefit from, their associations with mycorrhizae. In exchange for carbon from the plant, mycorrhizal fungi make phosphorus more soluble and bring soil nutrients (N, P, K) and water to the plant. The Cruciferae family (e.g. broccoli, mustard) and the Chenopodiaceae family (e.g. lamb's quarters, spinach, beets) do not form associations with these fungi. Frequent tillage, fungicides and high levels of N or P will inhibit root inoculation. Similarly, the practice of fallowing will reduce levels of mycorrhizae because the plants that establish following tillage usually do not form associations with the fungi.

This article is based primarily on the knowledge and observations of farmers who wanted to better understand the connection between what was growing in their soil and the various management practices they were employing.

The American poet Emerson once wrote, "What is a weed? A plant whose virtues have not yet been discovered," perhaps referring to their greatest virtue to farmers as messengers of the soil.

Recommended reading (available from the COG library):

Pfeiffer, E.E. (1981). *Weeds and what they tell*. Biodynamic Farming and Gardening Assoc, USA.
Soil Association. (1982). *The Value of Weeds*. Soil Association, UK.

Av emphasizes farmer-to-farmer knowledge exchange and works to hone farmer intuition in making management decisions. Currently, Av serves as a cannabis cultivation advisor to many Licensed Producers in North America and the Chief Science Officer with Green Gorilla (a Hemp and Cannabidiol Company). Av is also serving as the Vice-President of the Canadian Organic Growers and is proud to be a member of Slow Food Canada, Food Secure Canada, and the National Farmers' Union. Av is also a faculty member at Earth University (Navdanya) in India where he delivers courses on agroecology and organic farming. Av can be reached for questions or comment at 902-698-0454 *or* av@fs-cannabis.com.

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