

Special Section:
**Fostering Socially and Ecologically Resilient Food and Farm Systems
Through Research Networks**

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Growing in relation with the land: Experiential learning of Root and Regenerate Urban Farms

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Abstract

The food landscape of Calgary, Canada, is sown with an abundance of polycultures. Alongside place-specific Indigenous foodways are food rescue, banking, and hamper programs, food

studies scholars, a City of Calgary food resilience plan, and a growing number of alternative food network producers. Within the local alternative food network, there has been a boom in advancing indoor growing for our colder climate, including container, aquaponic, vertical hydroponic, and greenhouse growing. Situated as an agrarian ethnographer and an urban regenerative farmer, we seek to highlight the viability of agricultural techniques that are in relation *with the land* to grow more

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Second author Michael Gavin is the owner and operator of Root and Regenerate Urban Farms, and is therefore self-employed and financially invested in his agricultural business.

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socially and ecologically sustainable food and farm systems in and around Calgary. From this position, we formed a collaboration between the University of Calgary, Root and Regenerate Urban Farms, and the Young Agrarians to document the cultivation process for a production urban farm. Over the course of one growing season—May to September, 2021—we harvested approximately 7,000 lbs (3,175 kg) of produce across nine urban spaces totaling 0.26 acres. The 48 vegetable varieties were distributed to 35 community supported agriculture shareholders, weekly farmers market customers, restaurant chefs, and members of the YYC Growers and Distributors cooperative. Moreover, we donated 765 lbs (347 kg) of surplus produce to the Calgary Community Fridge, Calgary Food Bank, and the Alex Community Food Centre, which work to mitigate food insecurity. Through a reflexive practitioner approach, our reflective essay discusses the benefits and limitations of Small Plot Intensive Farming methods and urban land-sharing strategies, as well as the viability of land-based urban agriculture in a rapidly changing socio-ecological climate. Our paper also demonstrates the potential for transcending siloed approaches to knowledge-making vis-à-vis experiential learning partnerships between graduate student researchers, farmers, and agricultural organizations.

Keywords

regenerative farming, urban agriculture, small plot intensive farming, SPIN farming, alternative food network, food system resilience, land sharing, experiential learning, activist scholarship

Introduction

Guided by a set of dynamic principles, regenerative farming uses a combination of complementary and adaptive techniques in order to rebuild soil health and fertility, increase water percolation and retention, enhance synergetic biodiversity and ecosystem health, recycle nutrients and energy, reduce carbon emissions and atmospheric CO₂ levels, and minimize the use of agro-chemical and energy-intensive inputs (Altieri et al., 2015; McKay, 2012). Processes

of regenerative agriculture may include crop and intensive livestock grazing rotations, multi-species cover cropping, chopping and dropping, minimal tillage, integrated livestock and pest management, and the integration of native plants and pollinators (Horrigan et al., 2002). Although these methods are most often operationalized in rural settings with broader swaths of land, a growing number of urban agrarians are finding creative ways to incorporate regenerative techniques into their practices.

To deepen our understanding of the possibilities and challenges for regenerative cultivation in and around Calgary, we formed a partnership between the University of Calgary's Department of Anthropology and Archaeology, Root and Regenerate Urban Farms,¹ and the Young Agrarians (YA). Connecting the Western provinces of British Columbia, Alberta, Saskatchewan, and Manitoba, YA is a "farmer to farmer educational resource network for new and young ecological, organic and regenerative farmers in Canada."² Formerly housed under the nonprofit Organic Alberta, YA is now a program of the Agrarians Foundation, a charitable organization that provides public education on agriculture, community development, and environmental sustainability. In addition to networking events, farm tours, business bootcamps, land access programming, and reconciliation training for farming communities, YA offers an annual Apprenticeship program that matches aspiring farmers with mentors to hone their farming philosophy and techniques.

Funded by a Social Sciences and Humanities Research Council (SSHRC) Vanier Canada Graduate Scholarship and a University of Calgary Faculty of Graduate Studies Transformative Talent Scholarship, we established a mentor-mentee partnership from May to September 2021 to document the processes, barriers, and opportunities of small plot intensive (SPIN) farming in Calgary. Primarily practiced in urban centers with low-impact technologies, this farming technique utilizes consecutive planting, intense rotations, and close proximity of crops to one another to allow for a large amount of food to be grown in small spaces, thus maximiz-

¹ <https://www.rootandregeneratefarm.ca/>

² <https://youngagrarians.org/>

ing productivity. We asked: how and to what extent can urban farmers employ land-based regenerative practices to grow food for a local alternative food network (AFN)? How can experiential learning partnerships between graduate student researchers, farmers, and agricultural organizations support more socially and ecologically sustainable food and farm systems in Southern Alberta?

Although Calgary's AFN (see Rosol & Barbosa, 2021, for more on AFNs) has experienced a beneficial boom in advancing indoor growing for our colder climate—including container, aquaponic, vertical hydroponic, and greenhouse growing—we seek to highlight the viability of agricultural techniques that are in relation *with the land* to grow food, ecosystem resilience, and community. We intentionally use the term “with” the land, as opposed to “in” or “on,” to demonstrate the relationality between growers and landscapes, as well as to reflect our application of “no-dig” agriculture. The three main principles of no-dig include not tilling to minimize soil disturbance, covering the soil as much as possible, either with living plants or mulch, and leaving the roots of crops in the soil after harvest. The scope of this essay does not address conventional practices that rely solely on cultivating “in” the soil, nor does it discuss indoor operations that sit atop the land. We recognize that overlaps exist between these practices and that it is important to disrupt the notion of isolated

silos within food studies discourse, research, producer certifications, and consumer marketing. Nevertheless, framing our experience as growing in relation *with the land* best spoke to the values and approaches of our work.

Along with companion planting, crop rotation, and natural pest management, we employed SPIN farming techniques in household yards, on an apartment rooftop designed by Calgary-based Modern Office of Design and Architecture,³ between offices in the city core, and among green spaces adjacent to businesses and buildings (Figure 1). Over the course of five months, we collected data on the growing spaces, seeding and management practices, yields, and distribution streams for Root and Regenerate Urban Farms.

To evoke the multiple senses of experiential learning with the land (Francis et al., 2011; Parr & Trexler, 2011; Wiedenhoef et al., 2003), the next section will include a land acknowledgement and two reflective vignettes. Following the seasons, Michael Gavin will take readers behind the scenes of an urban farming business. Chelsea Rozanski will then focus on a day in the field—both ethnographically and agriculturally—through the lens of an agrarian anthropologist. In the subsequent section, we will situate our experiential learning research on urban agriculture in Alberta's food landscape and in broader grassroots movements seeking socially and ecologically resilient food and

Figure 1. Cultivating on an Apartment Rooftop (Left) and an Urban Business Space (Right)



³ <https://www.canadianarchitect.com/growing-together-grow-calgary-alberta/>

farm systems. Our reflective essay will conclude with an acknowledgement of our limitations, recommendations for future research, and the overall significance of regenerative urban farming efforts in rapidly changing environmental and political climates.

Reflections on Regenerative Farming in an Urban Context

Before we sow seeds and harvest yields, we offer gratitude and acknowledge those who have stewarded the lands and waterways of Southern Alberta for generations. This region of Turtle Island is the traditional territory of the Blackfoot Confederacy, who include the Siksika, Piikani, and Kainai First Nations; the Tsuut'ina First Nation; and the Îyethka Nakoda, including the Chiniki, Bearspaw, and Goodstoney First Nations. Calgary is also home to the Métis Nation of Alberta, Region III. Inuit and Indigenous Peoples, newcomers, and visitors from around the world also live, work, and play as members of Treaty 7. Relying upon the waters, soils, and pollinators of Calgary (Mohkinstsis [MOH-kin-stsis] in the Blackfoot language) to grow plants for foods and medicines, we situate ourselves and this research within the legacy of colonialism. As authors of European ancestry, we have been privileged to learn and cultivate at the historical displacement of Indigenous Peoples (Aldern & Goode, 2014; Carter, 1990; Kepkiewicz, 2015; Kepkiewicz & Dale, 2019; Matties, 2016). We acknowledge that the only voices we can represent are our own and take responsibility for any misrepresentations in this reflective essay.

Urban Ag Through the Seasons: Vignette by Michael Gavin

The growing season in Calgary officially begins while the snow is still flying in this area. The winter months offer a rest, but also a time for preparing and planning for the upcoming season. Farming at any scale, one's tools, equipment, seeds, and materials need to be inventoried, assessed, and replaced as needed. Taking stock of equipment and tools starts at the end of the season, around late October, when winter approaches and we put everything away. For things like Remy, a cotton and

synthetic fabric blend used to protect plants from frost and insects, we measure the lengths, check for holes, and replace as needed. This goes for all the different parts that make up intensive farming operations, such as irrigation components, starter trays, and the like. In December, we start ordering materials. This is when the farm expenses are the greatest. We replace supplies and repair equipment, take stock of what we need to grow, and collect membership fees needed to purchase the necessities to grow food in the summer. Programs such as community supported agriculture (CSA) are invaluable in helping offset some of these early and expensive purchases with pre-sold shares or CSA membership subscription fees.

The most important part of planning for the following season is done from December to January, when climate-sensitive crop designs are made for the season. With urban farming, plots and growing beds are not uniform, nor do they have equal conditions such as wind and light availability. This adds a certain level of complexity in planning that rural farms do not often have to factor in. All our planning is compiled on spreadsheets, using information from past growing seasons to create garden maps, action dates, volumes, and all the details needed to produce food at this intensive pace. This gives us a clear vision of how the season is going to look. Inevitably, the season will not go as planned (due to climatic conditions, human error, etc.). However, having this baseline plan allows us to adapt and refocus without being lost.

The first seedlings are planted indoors under lights at the beginning of March and hardened off in a passive solar greenhouse in April. From this time, the number of seedlings gradually increases to a peak around the first two weeks of May. At this point, the shelves in my office are bursting with seedlings waiting to be transplanted in unfrozen soil. Transplants will continue to be produced and planted through the middle of August, though in lower quantities. From April to May is when we also complete most of our outdoor plot preparation. Beds are cleared of winter covers and old plant debris, which are added to the farm's compost, and gently loosened with a broadfork. Compost is added to the topsoil, and drip irrigation is installed for increased water conservation. This

period requires a lot of multitasking, as other projects need to be completed concurrently, such as greenhouse construction and repairs to coolers, fences, and compost bins. Some crops and flowers are directly seeded during these weeks, but most transplants will not be planted until the middle of May.

Mid-May to mid-June is a particularly busy period, with thousands of plants transplanted and many rows directly seeded (Figure 2). Some plants need special care to protect them from harsh spring conditions, while other plants are being attacked by flea beetles, a major pest. Covering the plants with Remay fabric can help on both counts, keeping pests away from plants and insulating them from the wind and cold. Come the latter half of June, we enter into a bit of a lull. Most crops are

planted but not ready for harvest, giving us time to catch up on any weeding that may be needed. Harvest is underway by the end of June to fill our three major outlets: local farmers markets, a CSA, and wholesale markets. We continue with weekly plantings to maintain a steady vegetable supply. Farmers markets and CSA pickups are held multiple times a week for the next 15–17 weeks (Figure 3). Daily activities become more predictable and routine at this point, as we “rinse and repeat” the tasks that go into filling orders week after week.

As we approach the late season—end of September into mid-October—the rhythm changes once again. Crops are coming to completion with nothing to be replanted. This is when we start to put away irrigation and other equipment, cover beds with mulch, and cut down crop debris for

Figure 2. SPIN Farming in the Back and Front of Household Yards (Left and Right)



Figure 3. Distributing Produce at a Farmers Market (Left) and for CSA Members (Right)



compost. Odd jobs or new growing spaces are being completed; sales come to an end for our market, CSA, and wholesale distributor; and the season winds down until we reach one of the last jobs of the season. At the end of October to early November—depending on the forecast for snow and frost—we plant next year’s garlic crop in the ground and keep it cozy with a thick layer of straw. After that, we relish the brief respite in November before starting the cycle again in December.

*A Day in the Field for an Agrarian
Ethnographer: Vignette by Chelsea Rozanski*

“Trying to grow, yeah alright, trying to grow what’s outside.” The upbeat chorus by Canadian rock band, The Sheepdogs, rings louder as I groggily hit snooze on my 6:30 a.m. alarm. First task: brew coffee. Second task: toast a bagel for the road. I scoop a cup of kibble into a bowl and croak out, “Eat up, doggo. You’re coming today, and it’ll be a long morning.” Water bottles filled, *check*. Granola bars and lunch packed, *check*. Sunscreen and brimmed hat, *check*. Pulling up my overalls with one hand, I open the weather app with the other. Full July sunshine with a high of 20°C (68°F); a chance of light showers in the afternoon. Hopefully it will pass before the 3:00 p.m. farmers market.

I load up my SUV with old pallets gleaned from the side of a dumpster. Tomorrow we will be expanding the outdoor compost system. “Up, up. Let’s go buddy!” With my four-legged friend in tow, I set out on the road to meet Michael at

one of the household yards. When we arrive, Michael is already pulling back the white row cover on the spinach (Figure 4). “Good morning!” I exclaim as I secure my pup a distance away from the garden under a tree. “Drink your water, bud. We will be working for the next hour or so.” With a Rubbermaid bin, pruning shears, and a scale, we harvest the biggest leaves of each spinach plant. Filling the bins to the rim, we weigh them before stacking one atop the other into our trunks. Once finished, we slide the row cover back onto the metal hoops and stake it into the ground. “Not today, flea beetles!”

Ten minutes later, we park at the next plot, hop out, and go through a similar process with radishes. We begin pulling up the larger radishes from the base of the stem, tying bunches of five to six bulbs with a rubber band, and placing them in the bins. I run into a patch with compacted soil and use my Hori Hori knife to loosen the roots without cutting the plant. To our delight, we observe only a few bulbs with root maggot damage, which is to be expected in organic farming. Bending at the knees, I jigsaw the heavy bins between pallets and harvested spinach.

My stomach alerts me that it is now mid-morning. “Off we go, pup! Up!” Back in the car, I devour two Oats ’n Honey bars before arriving at the headquarters of Root and Regenerate Urban Farms. With the pallets unloaded, Michael and I begin shuffling the yields into a locked cooler so they don’t wilt while we wash and package them

Figure 4. Harvesting Spinach (Left) and Drying Radishes (Right) for a YYC Growers and Distributors Bulk Order



for a YYC Growers and Distributors (YYCGD)⁴ order. Taking off my shoes and socks, I fill one radish bin with water to soak while Michael sets up the sun-drying racks. Bunch by bunch, we hose any remaining soil off the plants and lay them out to dry (Figure 4). I close my eyes briefly to focus on the cool water between my toes, opening my eyes to a lapping sound on pavement. “Is that runoff water tasty? Ah, to be an agrarian researcher’s dog!” Turning the radishes over periodically, we move into the cooler to bag spinach. Thirty minutes and 350 150g bags later (~115 lbs, or 52 kg, total), we are ready to pack up. While Michael reloads the dried radishes into clean bins and drives the orders to the YYCGD warehouse, I prepare for this afternoon’s market.

Foldable tables and tablecloths, *check*. Whiteboard, markers, and moneybox, *check*. Tent, chairs, crates, and coolers, *check*. I go through the mental rundown: today we will be selling large bok choy, red Russian kale, collard greens, rainbow Swiss chard, carrots (with tops on and off), purple kohlrabi, fennel, turnips and radishes (bagged or with greens), green onions, cherry tomatoes, tatsoi, parsley, dill, romaine heads, and bagged lettuce, arugula, microgreens, and pea shoots. We will also have eggs available from Happiness by the Acre’s pasture-raised hens and haskap berries from West Raven Farms. Michael returns, and we soak in the sunrays over lunch.

“Stop chasing the wild rabbits and come have a snack!” We pack up the cars yet again, drop the dog off at my house, and head to the market. By the time we finish setting up, the first market-goers

trickle in. Today, a youth band is playing cover songs for the crowd. The scent of kettle corn mingles with our fresh produce, sending me into a stupor before a customer brings me back to reality.

“Excuse me dear, what are these, and how much do they cost?” she asks, to which I reply, “They are homegrown sunflower shoots.” I tell her they’re CA\$4.50 a bag. She grabs three bags plus a bundle of carrots and a dozen eggs. Around 4:30 p.m., the crowd picks up, despite this morning’s weather warning. So far, so clear. The market is more likely to get rained out in June, while July brings a steady chance of hail and heat. By 6:30 p.m., we’ve managed to sell most of our goods and commence the final pack-up for the day. En route to the container cooler, we drop off a donation of produce to the Calgary Community Fridge.

After an exhausting day, we go over plans for tomorrow’s composting makeover and part ways. I get home, open the door, kick off my shoes, and flop onto the floor, too tired to make it to the couch. A friendly but concerned face trots over to give my head a sniff. “Well, pup, no one ever said urban farming was easy! Nor experiential research, for that matter. Let’s get some food and rest for another big day ahead.”

Harvesting the Yields

Over the course of the growing season, we grew approximately 7,000 lbs (3175 kg) of 48 vegetable varieties (Table 1) across nine urban spaces totaling 0.26 acres (1,052.18 m²). This was roughly broken down into 3,015 lbs (1,368 kg) of 20 varieties of greens, herbs, and brassicas; 2,624 lbs (1190 kg) of

Table 1. Crops Grown by Root and Regenerate Urban Farms

Crop Category	Crop Types	Total Crop Yields
Greens, Herbs, and Brassicas	Arugula, basil, bok choy, broccoli, cabbage, cauliflower, cilantro, chives, collard, dill, kale, lettuce, lovage, mustard, microgreens, parsley, radicchio, spinach, Swiss chard, tatsoi	3,015 lbs (1,368 kg)
Roots and Below-Surface	Beet, carrot, celeriac, garlic, parsnip, potato, radish, rutabaga, sunchoke, turnip	2,624 lbs (1,190 kg)
Other Vegetables and Fruits	Bean, celery, cucumber, fennel, kohlrabi, leek, onions, pea, pepper, rhubarb, squash, strawberries, tomato, zucchini	1,075 lbs (487 kg)

⁴ <https://yycgrowers.com/>

10 different root and below-surface crops; and 1,075 lbs (488 kg) of 14 other vegetables and fruits that were distributed to multiple outlets. These included a weekly farmer's market, YYCGD Harvest Boxes, 35 CSA shareholders, and several restaurant chefs. From mid-June to the end of September, an estimated 7,500 units of produce (i.e., 1 lb of turnips, 1 bunch of dill, 1 bag of spinach, etc.) were distributed to YYCGD, which came to 150–400 units per week, and 2,500 units were sold to the other outlets. While CSA members received a share of five to seven units per week, about 30 units of produce were sold at each market day. Located in the city's northwest quadrant, the Triwood Farmers Market serves the Brentwood, Charleswood, and Collingwood neighborhoods, which are mostly characterized by middle-income private households, according to The City of Calgary Community Profiles (n.d.).

Moreover, 765 lbs (9347 kg) of surplus produce were donated to social agencies that serve food-insecure populations and work to mitigate hunger, including the Calgary Food Bank and the Alex Community Food Centre. While we did not collect consumer demographics, our small urban farming operation contributed to the nourishment of roughly 300 individuals per week for a quarter of the year. Producing this quantity of food required roughly one and a half full-time employees. Root and Regenerate Urban Farms does not

rely on volunteer labor to complete its work but welcomes those interested in hands-on learning to take part in plot building, planting, packaging harvests, and more. One to three days per month, we were joined by volunteers who were compensated in-kind with produce. Upon harvest, we calculated the total weight of yields. We also gathered crop- and climate-specific data for direct sowing versus transplant dates and ages, days to maturity for both sowing types, Jang Seeder roller sizes, and feet needed per unit based on space and depth of plants, rows, and beds (Table 2).

Additionally, we made observations of the diversity of pollinators (i.e., at least five *Bombus* species, and species of mason bees, leaf cutters, and other ground nesting solitary bees) frequenting blooming vegetables and flowers in the urban growing spaces. Flowers and medicinal plants that we sowed in the garden spaces included Comfrey, Delphinium, Lupin, Sunflowers, Tobacco, Yarrow, Aster, Strawflower, Calendula, Coneflower, Cosmos, Vetch, and Phacelia. We also collected information on water usage and retention using drip lines and hemp mulch on beds. We noticed a decrease in flea beetle and cabbage moth presence on plants under Remay, participated in soil sampling with YYCGD, and tarped new plots to suppress weeds for the subsequent summer. Our outcomes demonstrate the viability of growing food outdoors despite Calgary's climate, while

Table 2. Example of Crop Data by Root and Regenerate Urban Farms

	Arugula	Swiss Chard	Broccoli	Dill Leaf
Sowing type & Jang size	Direct (YYJ24)	Indirect	Indirect	Direct (MJ24)
Plants per 10 ft.	672	60	13	864
Plants per ft.	67	6	1	86
In row (in.)	1.25	6	18	1.25
Between rows (in.)	3	10	16	3
Rows in 30 ft. bed	7	3	2	9
Transplant age (days)	N/A	30	30	N/A
Days to maturity	38	60	69	50
Days to maturity with transplant	38	46	55	50
Planting dates	April 17–May 8	May 8–May 15	May 8–May 29	May 29–June 15
Feet needed per unit	0.5	0.5	0.75	0.7

building soil health and supporting native pollinators through strategic landscape design and land-sharing opportunities (Wezel et al., 2016).

Benefits and Barriers of Urban Farming with the Land

The growing spaces in which RRUF operates are obtained through partnerships with homeowners, businesses, and apartment managers. Accessing land is one of the biggest barriers facing aspiring agrarians, both in urban and rural settings. The ability to arrange land-sharing contracts, which can range from fully donated spaces to affordable leases or barter agreements, opens up the doors for urban farmers to actually make a living. Some homeowners opt for up to two CSA shares in exchange for the land provided. At RRUF's main plot, Michael provides landscaping and lawn care throughout the season. This arrangement is a fairly minimal burden for an urban farmer, though it can differ from contract to contract. Nevertheless, no-dig SPIN farming requires a high investment in resources (e.g., the compost and mulch that are brought in) and time (e.g. human labor, plant growth, the time it takes to regenerate soil biodiversity). Therefore, the lack of long-term security is a shortcoming of land-sharing where only one partner owns the land.

Michael faced this scenario in 2021, when one plot's homeowners moved and the new buyers wanted the gardens removed. A similar scenario happened to Leaf & Lyre Urban Farms, one of the first SPIN operations in Calgary. Although a plot's property owner had the intention of selling their house, the landlord and urban farmers (who had been building the yard's soil for several years) were not informed, so that the yard would continue to appear lush to potential buyers. "I felt used and frustrated, because I put in so much love and attention. I built a relationship with that soil over the course of years; I couldn't just leave it there," said Leaf & Lyre's owner Rod Olson, "I was never the one 'in charge' of the yards with which I built a relationship. There was always the feeling of uncertainty."

Another urban farm that has faced similar vulnerability is Grow Calgary, which originally produced its food on city-owned land from 2013 to

2018. When expansions to a major roadway were imminent, the farm was required to find a new location and start from scratch. It took a year to secure a new land partnership, and in spring 2020 the organization was able to operate once again (Klinke & Samar, 2021b). After four seasons of cultivating and rebuilding infrastructure on this privately owned land in Balzac, just outside municipal bounds, the organization had to relocate again in 2023, as the 73 acres were to be developed. Driving in any direction from Calgary, one can see a new neighborhood or warehouse being built where cropland or pasture once grew.

Highfield Regenerative Farm and Land of Dreams are two more operations situated on public land, holding municipal and provincial leases, respectively, that allow for the production of food above ground (the former is zoned as a brown site). Neither organization is allowed to alter the landscape in any major way (e.g., digging a well or swales for improved water access and security, planting or strategically removing trees) nor graze animals to break up the compacted soil caused by heavy machinery. Moreover, neither have reliable access to water or power, which makes the stretches in summer without rain precarious. The renewal of leases depends on the perceived outcomes of targets outlined in contract agreements, which holds both farms accountable to their intended projects, but leaves them vulnerable to changes in land use.

Nevertheless, with creativity, determination, and social organization, all three operations have been able to succeed in growing food *with* the land and in building stronger relationships with the City of Calgary. To Highfield's Operations Manager, Heather Ramshaw,

the world of urban agriculture in Calgary is growing a lot, but there's not a lot of widespread municipal understanding. The department we work with gets it; we have a supportive municipal liaison who needs more support themselves to push these agendas forward. But generally, if you're trying to make policy and bylaw changes, that's when you hit walls here and there. Existing as a pilot project of the City puts us [Highfield] in a very unique position

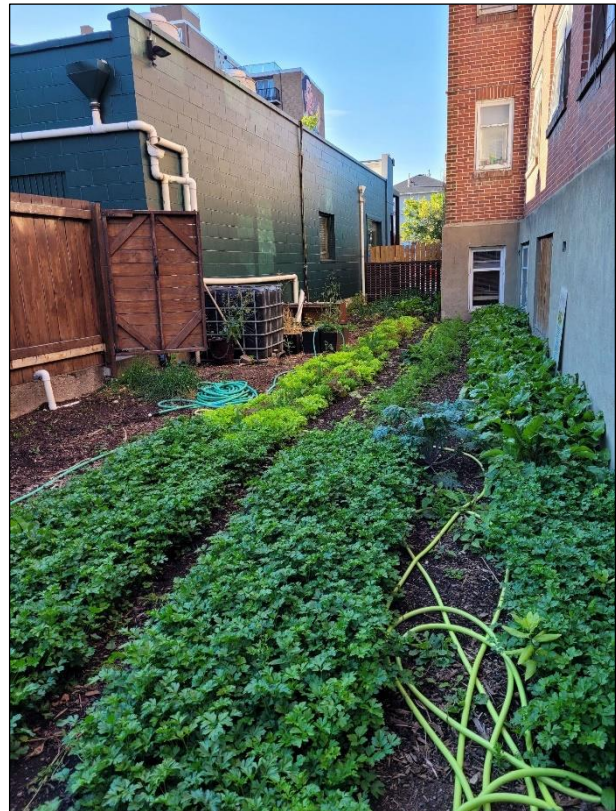
where we can comment on certain things, such as best practices in agriculture. When a bylaw was being rewritten, we were consulted to ensure it would not negatively affect us, to make sure Highfield still fits in with the City's plans. We are continuing to report and we still have access to this property, which is amazing, but we aren't sure what other steps of support will be taken by the City. Calgary is years behind Canadian cities like Toronto and Vancouver in policy, execution, and support for urban agriculture. Although the change here seems slow, it's gaining momentum, and it's exciting to be a part of it! The network of urban farmers and people looking into food access has started to come together and collaborate, especially in the past year, as we work towards a similar vision.

At RRUF, the limitations we faced for growing on an apartment rooftop were more logistical. To get to the 16 planter boxes—which were filled by a

lift with 1,800 ft³ of soil—we had to squeeze tools, storage bins, and trays of transplants into one elevator and then climb up two flights of stairs. At the top, there was no setup for compost, tool storage, or shade, and the irrigation installed was inefficient. Despite these shortcomings, it was a great experience to grow food alongside the apartment tenants who had their own boxes. With proper architectural design that accounts for weight capacity and accessibility, we argue that integrating more rooftop gardens for growing food and native plants would add ecological and social value to urban centers.

Growing food in between buildings downtown (Figure 5) also had its perks and setbacks. The actual space and available parking was quite limited, which meant hauling supplies down several blocks. Since the plots were located on 17th Avenue, an area dotted with bars and restaurants, nothing could be stored at the site itself, as theft was an unfortunate reality. The water source was outside of the locked fence, so installing automated water-

Figure 5. Growing in Between Buildings Downtown (Left and Right)



ing wasn't feasible, which in turn required more frequent labor. Since quite a bit of shade was cast by the surrounding buildings, we were mindful to plant crops that did not require full sun exposure. The space was maximized with leafy greens, while the sunny rooftop garden overflowed with heat-loving plants. Nevertheless, it was a unique opportunity to grow produce for a restaurant right down the street. Passersby would stop and ask questions and sometimes spontaneously get involved. Due to the aforementioned challenges with this downtown site, RRUF decided to not renew its contract the following summer. We connected the property owner with Amber Cox, a Cree Métis artist and gardening enthusiast, who has since stewarded the space for community gatherings.

Finally, we recognize the spatial, temporal, and climatic limitations of our experiential learning research, as we are focusing on a single growing season in southern Alberta, Canada. Nonetheless, framed within the ethos of "ecological responsibility, social responsibility, and economic viability," we argue how similar regenerative SPIN farming operations can be scaled up and out to not only grow food but ecosystem resilience and community networks. The following summer, 2022, Root and Regenerate took on two more YA Apprentices, underwent a rebranding, updated its website and marketing, added 10 more shareholder spots to its CSA program, and acquired a passive solar greenhouse, which boosted the quantity of heat-loving crops. The farm team harvested a total of 6,127 lbs (2,779 kg), consisting of 2,290 lbs (1,038 kg) of roots, 2,909 lbs (1,320 kg) of greens, and 928 lbs (421 kg) of other assorted produce. Of that, 615 lbs (279 kg) were donated to local food access agencies. The farm welcomed two more YA Apprentices for the 2023 growing season and has continued to slowly scale up its customer base, production, and collaborations with other urban farms.

As farmland is blanketed by ever-expanding residential developments and shopping centers, and is increasingly controlled by concentrations of agribusiness, conversations around urban regenerative agriculture are more and more relevant. In the next section, we will situate our experiences farming in Calgary in the patchwork of Alberta's food landscape.

Situating Urban Farming in Local to Global Food Landscapes

In Canada, urbanization and the decline of farming populations has been visible across all provinces. While one in three Canadians lived on a farm in 1931, less than 2% of the total population now run farming operations. Canadian farm operators are primarily males over 50, with more female and young farmers on a steady rise. In Alberta, for instance, approximately 9% of farm operators are under 35, while 62% are aged 55 and over (Statistics Canada, 2021). While there are fewer farmers and farm operations in Canada, the average area per farm has grown with more area devoted to crop production and ranching. Over the past century, from 1921 to 2021, the total number of [reporting] farms decreased by 73% (711,090 to 189,874 farms), while the average farm area increased from 198 acres (0.80 km²) to 809 acres (3.27 km²; Statistics Canada, 2021). With an average provincial farm size of 1,000 acres (4.05 km²), Alberta's agricultural landscape (Table 3) is reflective of the top two national farm production types: oilseed and grain farming and beef cattle farming, including feedlots.

These statistics and agricultural demographics are reflective of past, current, and future challenges for small-scale farmers in Canada at large, including cost of land and competition with investment companies producing oilseed, grain, and beef (Kepkiewicz & Dale, 2019; NFU, 2015). Lyle Weigum, co-operator of Winter's Turkeys Farm, and aspiring farmer Landon Grams spoke to these barriers to entry. Lyle shared:

Both my parents were farmers and their parents were farmers. My father started a farm from scratch and has now reached the point of retirement; my sister has taken over. If she didn't, it would have been absorbed by either another bigger farm or a Hutterite colony. People that want to get into agriculture have to start on such a small scale. Then they see what it takes to be successful, which is usually large-scale. There are such high capital barriers to entry that it discourages or bars a lot of people from entry. It's not that there are fewer people that want to farm; there are a lot of people that

Table 3. Alberta's Agricultural Landscape

Agricultural Category	Crop or Animal Type
Livestock	Hens and chickens, hatching eggs, broilers and roasters, Cornish hens, turkeys, ducks, geese, cattle and calves, beef cows, dairy cows, pigs, sheep and lambs, horses and ponies, donkeys and mules, goats, llamas and alpacas, ostriches, bison, elk, deer, rabbits, minks, honeybees, and crickets
Field crop and hay	Oats, barley, wheat and durum wheat, rye, triticale, hemp, flaxseed, corn for grain and silage, canola, dry field pea, chickpea, fava bean, lentil, a small amount of dry white bean and canary seed, alfalfa, hay and other fodder crops, forage seed, potato, mustard seed, sunflower, and sugar beet
Vegetables (field)	Sweet corn, tomato, cucumber, green pea, cabbage, Brussel sprouts, carrot, beet, rutabaga and turnip, onion (dry, yellow, Spanish, and cooking), garlic, lettuce, kale, rhubarb, spinach, pumpkin, squash and zucchini, and asparagus
Fruits and berries	Saskatoon, apple, pear, plum and prune, sweet and sour cherry, apricot, strawberry, raspberry, cranberry, highbush blueberry, currant (black, red, and white), and haskap
Greenhouses	Fruits, vegetables, cut flowers, herbs, and potted indoor and outdoor plants
Other	Sod, nursery products, Christmas trees, and mushrooms

Data derived from the 2021 Census of Agriculture Mapping Tool

(<https://www150.statcan.gc.ca/n1/pub/32-26-0003/322600032016001-eng.htm>)

want to do this work. But getting started is so difficult. It's so big. And so, there are fewer and fewer farmers. The people who are passionate and industrious about it, I hope they can find a way.

Landon observed:

Farming in Alberta is vastly industrial, with feedlots and monocropped fields monopolized by large corporations. It is hard for small farmers to compete in today's market and make any money. Small farmers face many challenges, from setting up the necessary infrastructure to rebuilding soil in a field that has been damaged by years of conventional tillage, to acquiring crop insurance. When I apprenticed at a regenerative farm through the Young Agrarians, our crops not only suffered from low precipitation but a severe hailstorm that swept through. Fortunately, the farm has a loyal customer base and network of other producers who got them through it.

Another agrarian research participant spoke to the emphasis provincial and federal governments place on increasing Canada's export market:

Technologies and infrastructure are not only funded for growing crops and animals, but for preparing them for export. The national goal is not to help achieve an infrastructurally and food-secure local or regional economy. Some money, attention, and policy is being directed to growing regional economies, but it's not where the majority of energy is being funneled. So, many farmers have felt pushed along this treadmill to get big or get out. While chasing profits, they need more land and special equipment, then pesticides, herbicides, special seed, etc. But where are the costs felt? What are the externalities that are made invisible for the average consumer?

Although there has been a heightened demand over the past 20 years for products grown and raised in Alberta, the landscapes are still dominated by a productivist conventional agri-food model (Beckie & Bacon, 2019). Additionally, what small-scale growers can actually do and who they can feed are further limited through municipal, provincial, and federal policies that are shaped by hegemonic development frameworks.

Approaches to Agrarian Development in Calgary

In most Canadian cities, the dominant approaches to agrarian and community development are reactionary and needs-based, focusing on increasing food access and security with limited ability to disrupt hierarchies of power (McEntee & Naumova, 2012). Food insecurity is often framed within poverty discourse—to which the solution is adequate income, a strong social safety net, and integration into the market (Levkoe, 2006). Food insecurity is “tackled” by secondary markets that function within a dependency model shaped by an uneven global capitalist economy (Claeys et al., 2021). Although food banks, hampers, and free meals are currently essential for meeting basic needs, “work done under the auspices of food security has often reproduced the socially inequitable conditions and relations it nominally seeks to address” (Cadieux & Slocum, 2015, p. 4). Moreover, the focus on productive intensification and agro-biotech solutions externalizes the socioeconomic, ecological, and political implications of global industrial agriculture (Claeys et al., 2021).

Our research is not claiming that the answer to solving global hunger is regenerative urban agriculture. We acknowledge the limitations of production in terms of scalability (i.e., the acreage of urban yards relative to Sections and Quarters), vulnerability (e.g., someone else owning and controlling the land), human capacity (e.g., number of trained farmers and the labor input due to limited machinery), and environmental impact (i.e., burning fossil fuels to get a relatively smaller amount of produce from point A to B). Nevertheless, urban farming can be a tool to highlight the mismanagement of how internationally traded food is grown and circulated, as it is controlled by an increasingly corporatized agro-food sector (Akram-Lodhi, 2013; Holt Giménez & Shattuck, 2011). Urban farming can be a pathway of collaboration between local food movements and emergency food systems (McEntee & Naumova, 2012) and can be integrated into federally funded school farming programs or into a business model wherein a corporation could employ urban farmers to grow food for its employees. With over 5,600 parks and natural areas spanning 10,000 hectares (100 km²), there are ample opportunities for regenerative farming to be

incorporated into the City of Calgary’s parks operations. For instance, a targeted grazing program was initiated in 2016 for goat and sheep herds to support land management and naturalization projects across the city’s bluffs. What’s more, as demand for renewable energy grows at national and international levels, urban farmers could support the transition to electric vehicles due to their close proximity to charging stations between sites of production and distribution.

Many urban farmers utilize indoor spaces such as containers and warehouses to grow microgreens (e.g., Micro YYC, Little Sprout House, Micro Acres, Sunleaf Microgreens YYC, and Holistic Urban Farmer), herbs and leafy greens (e.g., The Basil Ranch, Deepwater Farms, Greengate Garden Centres LTD., and Lil Green Urban Farm), and mushrooms (e.g., Pennybun’s Mushrooms) year-round. In yards and urban farms, one can find apiaries stewarded by MOB Honey, Buzzy Bee Honey, Forever Bee, and The Urban Bee Hive, who receive support and guidance from the non-profit Calgary and District Beekeepers Association. Offering workshops and resources for urban growers, the Calgary Horticultural Society and Urban Farm School strengthen partnerships and build cultivation skills among community members. If community members are interested in learning about permaculture or acquiring a permaculture design certificate, they can reach out to the Permaculture Calgary Guide, Verge Permaculture, or Prairie Sage Permaculture. Other permaculture-oriented organizations include Permeate, reGenerate Design, Urban Farm Permaculture Project, and the Métis-led social enterprise FoodScape Cooperative. Sponsored by the Permaculture Calgary Guild, Calgary Harvest is a nonprofit organization that connects homeowners with registered fruit trees to Calgarians interested in picking their apples, crabapples, plums, pears, and sour cherries.

In addition to RRUF, Chef’s Table is another SPIN farming operation that grows produce for local farmers markets, restaurants, CSA programs, and YYCGD. Connecting Calgarians (and area) to 24 farmers in Southern Alberta, this farmer-owned cooperative offers an online Farm Store, Vegetable Harvest Box (CAD \$35.00/box, weekly or biweekly), and add-on subscriptions. Customers

can access GMO and glyphosate-free produce, microgreens, grass-fed meats, fresh eggs, BC fruit, and locally roasted coffee. With 20 pickup locations across Calgary, Cochrane, Airdrie, Okotoks, and Langdon, YYCGD emphasizes the importance of “healthy ecosystems, regenerative practices, and seasonal goodness” to increase the region’s food resilience⁵ (see Tendall et al., 2015; Walker & Salt, 2006, for more on food resilience). The growth of Calgary’s agricultural scene has been supported over the years by the City of Calgary’s 2012 Food Action Plan,⁶ COVID-19 Food Resilience Team, and Food Access Collaborative. The introduction of affordable mobile markets (i.e. Fresh Routes) and advocates of food justice (Alkon & Norgaard, 2009; Calhoun, 2008; Reynolds et al., 2018) have also supported Calgary agriculture.

While situating our ethnographic, experiential learning research in Calgary’s approaches to agrarian and community development, it is important not to fall into the “local trap” (Carolan, 2016; Hinrichs, 2014). The importance of “local control to democratic decision-making” (Beingessner, 2013) is invaluable in supporting communities to rebuild socially just, economically viable, and ecologically sustainable food systems (Blay-Palmer et al., 2013). However, as DuPuis et al. (2006) make clear, the “local” is often a site of inequality. By practicing a “reflexive politics of localism” (DuPuis & Goodman, 2005), regenerative urban farmers can apply a “progressive sense of place” in which the scope of inequalities wrought by globalization and neoliberalism can be articulated in order to work toward a rights-based food system (Hassanein, 2003; Levkoe, 2006). In these ongoing processes and relationships, it is essential to connect with global resistance movements, such as Conscious Planet’s Save the Soil Movement,⁷ to support those facing similar barriers imposed by the system. Moreover, it is crucial to build alliances for collective action that span spatial and political bounds.

Local to Global: Sowing Seeds for Alliance-Building

Around the world, grassroots organizations have been resisting the concentration of land-grabbing, input-heavy production, environmental degradation, volatile markets, and the cooptation of water and seeds through protests, farmer-to-farmer workshops, and social movements. One notable international movement is La Vía Campesina (LVC). Founded in 1993, LVC emerged as a counterforce to neoliberalism. Through 182 organizations and more than 70 popular education training programs, LVC connects over 200 million farmers on small and medium-sized farms, landless workers, Indigenous people, fishers, pastoralists, migrant farmworkers, rural women, and youth from 81 countries. Grounded in a Food Sovereignty approach, this “global voice of the peasants” works toward equitable access to and control over resources and social rights, equal participation and representation in food politics, and the eradication of violence against women (La Vía Campesina, 1996; Nyéléni, 2007; Wittman et al., 2010). In Canada, two member organizations of LVC include Union Paysanne, an agricultural and civic organization operating in Quebec, and the National Farmers Union, a country-wide union of Canadian farmers seeking to achieve policy and reform (Dale, 2021). Within the National Farmers Union, YA advocates on behalf of new agro-ecological farmers, such as ourselves.

Supporting global and place-based efforts for social, ecological, and food justice from Canada have also been alternative food initiatives, Idle No More campaigns, provincial networking organizations, and food policy councils. The People’s Food Commission, for example, brought together thousands of actors in Canada into conversations around the food system. The conversations set the stage for the National Food Security Assembly, Food Secure Canada, Canadian Association for Food Studies, People’s Food Policy Project, UN

⁵ Watch the New Urban Farm Partnership video (2016) *Cultivating Calgary’s Local Food Resiliency*, available at: <https://vimeo.com/160987626>; GROUNDED (2020): https://www.storyhive.com/projects/6128#project_pitch; and the Emerald documentary series, season 3: <https://www.youtube.com/watch?v=wdSDo5tlmj0&feature=youtu.be>

⁶ <https://www.calgary.ca/major-projects/food-action-plan.html>

⁷ <https://consciousplanet.org/>

Special Rapporteur on the Right to Food visit, and Regeneration Canada, among others (Agriculture and Agri-Food Canada, 2019; Levkoe, 2006). Another organization connecting rural farmers and ranchers across Alberta, specifically, to share climate strategies is Rural Routes to Climate Solutions. In addition to a regenerative agriculture lab, solar lab, podcast series, and blog, Rural Routes has partnered with the Siksikaitsitapi Agriculture Project, which is “an avenue for the Blackfoot Confederacy of Southern Alberta to highlight on-farm and on-ranch climate solutions (e.g. regenerative agriculture, farm energy efficiency, on-farm clean energy) on Blackfoot territory.”⁸ Dawn Morrison (2011) of the Secwépemc Nation and director of the Working Group on Indigenous Food Sovereignty⁹ urges Canadians, rather than subsuming Indigenous food activism, to engage with Indigenous cosmos, struggles, and narratives and utilize our respective platforms—such as this publication—to promote Indigenous-led organizations responding to community needs around food.¹⁰

To share our experiences, experiential methods, and findings with the public and fellow scholars, we co-presented at the 2022 University of Calgary Graduate Students’ Association Symposium and in the Department of Anthropology and Archaeology Talk Series. We also co-hosted farm tours with the YA Apprenticeship program and the Calgary Institute for the Humanities’ Food Studies Interdisciplinary Research Group. Through our academic-agrarian partnership, we hope to continue building alliances both locally and globally.

Conclusion

One of the biggest challenges facing our global food and farming system is the feasibility of simultaneously supporting economically viable farmers, sustainable or regenerative environments, and sufficient food for all humans. At the production level, almost all urban and rural farmers in South-

ern Alberta participate in the market economy. As relative living costs are reinforced by the economic model—which regulates prices in housing, transit, gas, and other expenses—farmers must market to those who can afford plants and animals grown by well cared-for workers and soil. This predominantly includes middle- and upper-class households with sufficient financial capital to participate in an alternative food network (AFN). In our season of experiential learning research, our CSA shareholders, YYCGD Harvest Box clientele, and farmers market attendees were able to purchase the CAD \$7 free-range eggs, CAD \$5 carrot bunches, and CAD \$4.50 microgreens we offered, but this is not the case for the majority of Calgarians.

Beyond cost, the spaces in which AFNs operate—including farmers markets, CSA programs, and community gardens—have been critically examined for their “whiteness” and assertion of privilege (Allen, 2008; Mares & Peña, 2012; Slocum, 2006). As demonstrated by Kato (2013) and Hanson et al. (2019), other factors hindering participation in an AFN or CSA include limited choice in fruits and vegetables, unfamiliarity of the model, high upfront cost and purchase options, and time-intensive provisioning. The accessibility and hours of pick-up locations have also been criticized, as they are most often located in areas where profit can be made from sales, and not in regions with lower economic incomes.

In Calgary, distributors have partnered with the City to provide more accessible pick-up and pop-up locations at C-Train Stations and Community Association centers, as well as offering door-to-door delivery services for an additional fee. RRUF also observes the aforementioned barriers in its operations and strives to address them the best they can while functioning in the existing economic model. The farm diversifies produce options wherever possible and offers CSA customers the option to swap produce at pick-ups. This diversity can be

⁸ <https://rr2cs.ca/siksikaitsitapi-program/>

⁹ To learn more about Indigenous Food Sovereignty in the Canadian Context, see:

https://www.indigenousfoodsystems.org/sites/default/files/policy_reform/pfpp-resetting-2011-lowres_1.pdf; and <https://foodsecurecanada.org/sites/foodsecurecanada.org/files/indigenous-food-sovereignty-eng.pdf>

¹⁰ See <https://www.indigenousfoodsystems.org/>; <https://www.itk.ca/projects/inuit-nunangat-food-security-strategy/>; <https://www.anishinaabegagriculture.org/food-sovereignty>; and <https://www.sylx.org/>, among many others.

limited by what can be feasibly grown to produce a profit or at least break even. Split payments are also made available, as opposed to the full cost upfront, and relative to similar CSA programs, RRUF offers a lower share cost. Finally, shareholders can choose between two different pick-up locations and timeframes, although these remain a persistent barrier. The logistics and costs associated with increasing options are currently not feasible.

The handful of farmer-led initiatives that do work directly with food-insecure populations to build capacity in farming, or grow with the intention of streaming yields into food access agencies, still function within a cycle of dependency upon donors and volunteers. This has been critiqued as an unsustainable and privileged organizational structure, particularly for women who may already carry a double burden of household and (re)productive labor (Som Castellano, 2016). When a single mother of four is already overburdened with responsibilities, how could she be expected to farm and provide food for her family? Even with increased opportunities for relationship-building and knowledge-sharing between growers and consumers in an AFN, farmers and farmer cooperatives are challenged with engaging local residents—and therefore scaling up production (Kato, 2013). Co-owner of YYCGD Rod Olson expressed how they are now down to 300 CSA Harvest Boxes a week; 500 is their sustainable target:

During the pandemic, we saw an uptake in shareholders. People could not travel, and so they put their interests and dollars in the local economy. But now, post-COVID, people are wiped out; they just need to do the most convenient thing. Regenerating our food system is not convenient. We are fighting against the convenient mecca of the industrial food system.

Urban agriculture will not end world hunger, solve climate change, or increase global soil fertility alone. To Kolby Peterson, the YA Alberta apprenticeship coordinator,

regenerative farming is needed en masse; the scale needs to be in broad strokes across the

landscape. But in thinking about how human beings, myself and the people on this farm, how we meet our needs, regenerative agriculture needs to be broadened to include all of living. What does a regenerative life look like?

As urban populations and development expansion continue to rise, as do barriers to accessing rural land, there need to be frameworks and policies in place that support agrarian and soil-building initiatives in urban spaces.

Recommendations for Future Research

As urban agriculture becomes more prolific, our recommendations for further research include the incorporation of land-based learning in urban farming processes among post-secondary courses (Klinke & Samar, 2021a) and the contradictions and convergences of Indigenous Food and Land Sovereignty efforts with urban farming expansion (Grey & Patel, 2014; Kepkiewicz & Dale, 2019). We also recommend researching the possibilities for land-sharing and cooperative farming models (Sumner, McMurtry, & Renglich, 2014) and community-led organization strategies to grow and circulate food outside of the market economy (Claeys et al., 2021; Dale, 2021). If a SPIN farming model were to be replicated in thousands of urban plots all over the world, it would be extremely valuable to gather quantitative data on its cumulative impact, as well as qualitative data on customers' feelings toward accessing local food and perceptions of health benefits across different ethnicities, classes, sexes, and so forth. Further comparative research could examine the yields of a SPIN operation compared to those of an average rural vegetable farm of similar acreage. The comparison could show the cost of a vegetable bed in terms of water, plants, irrigation, time in hours, yields, and returns. This comparative analysis could be expanded to include the number of families served per bed and an estimate of nutrients per bed of a popular crop.

Impact of our Work

In and around Calgary, the number of organic, regenerative, and agroecological producers has visibly increased alongside beekeepers, permacultur-

ists, indoor growers, coffee roasters, brewers, and more. This growth in alternative food and farming is greatly needed in a time of corporatized industrial agriculture (Emile, 2016). At the same time, the city has seen a rise in demand for social agencies, registered charities, and community groups working in food banking, hamper, rescue, and redistribution programs. In the past few years, there have been more interactions among food producers, distributors, and social agencies, but most of the work continues to take a siloed approach. Most often, researchers conduct theoretical studies from within the university, while farmers spend long hours tending their crops and animals. Agencies race to meet a growing demand for basic necessities, and policymakers adapt to ever-changing governing agendas. If research networks are to truly help regenerative agriculture “better deliver on its promise of providing enhanced social and environmental benefits”—the theme of this Special Issue—then we need to look beyond our agrarian collaborations to see how academic seeds of praxis are being tended in the dynamic social soil that supports our work.

In this reflective essay, we depicted the collaborative approach taken between a graduate

student researcher and an urban farmer, coordinated and supported through a regional agricultural organization, the Young Agrarians. We contextualized our five-month fieldwork in the broader characteristics of Albertan agriculture and the dominant approaches to agrarian development in Calgary. Connecting local experiences to global movements, our paper emphasized the importance of growing the grassroots up and out, while staying grounded *with* the land, to address the structural inequalities that affect small-scale farmers in both rural and urban settings. Our hope is that practitioners and researchers working in food systems and coalition-building will be able to draw upon the frameworks and ideologies put forth while tailoring them to the people and networks of their area.



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