

# **Kwantlen Polytechnic University**

**Department of Sustainable Agriculture**

**KPU Farm @ Garden City Lands**

## **2024 Activity Report**



**City of Richmond Department of Parks, Recreation, and  
Cultural Services Committee**





# Introduction



Kwantlen Polytechnic University has now completed seven growing seasons at the KPU Farm on the Garden City Lands. The first three hectares (Phase 1) were certified organic by the BC Association for Regenerative Agriculture in April of 2021, upon completion of the three-year organic transition period. We have continued to develop production fields, infrastructure and habitat and diversity plantings on the site.

## Highlights of 2024:

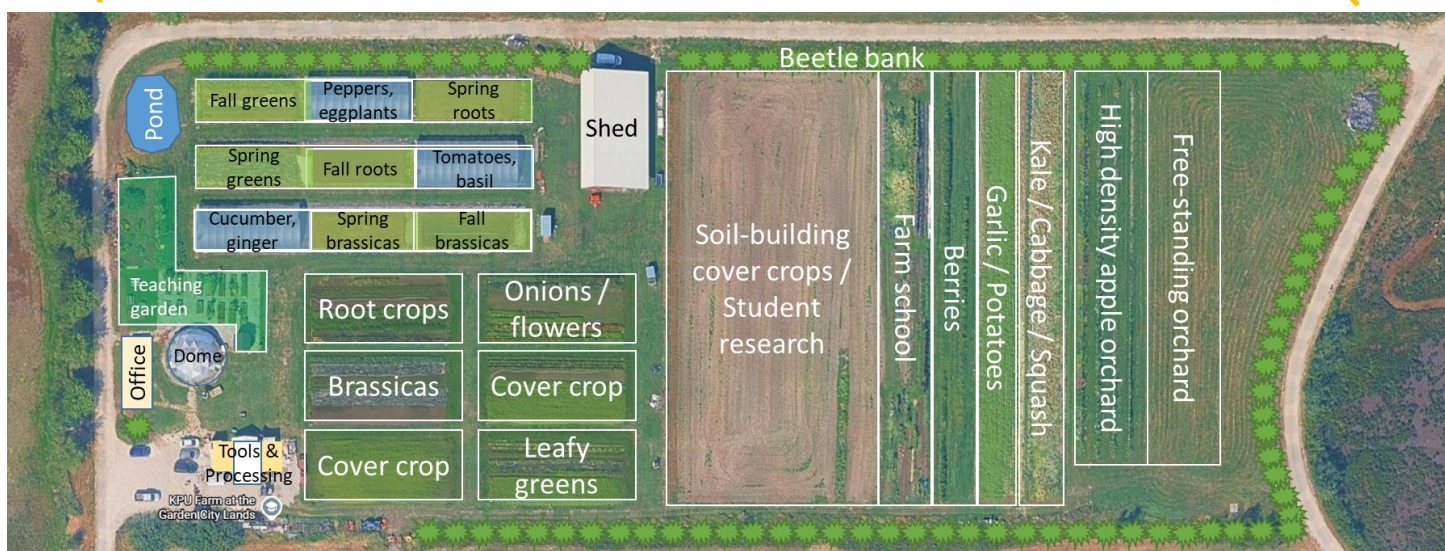
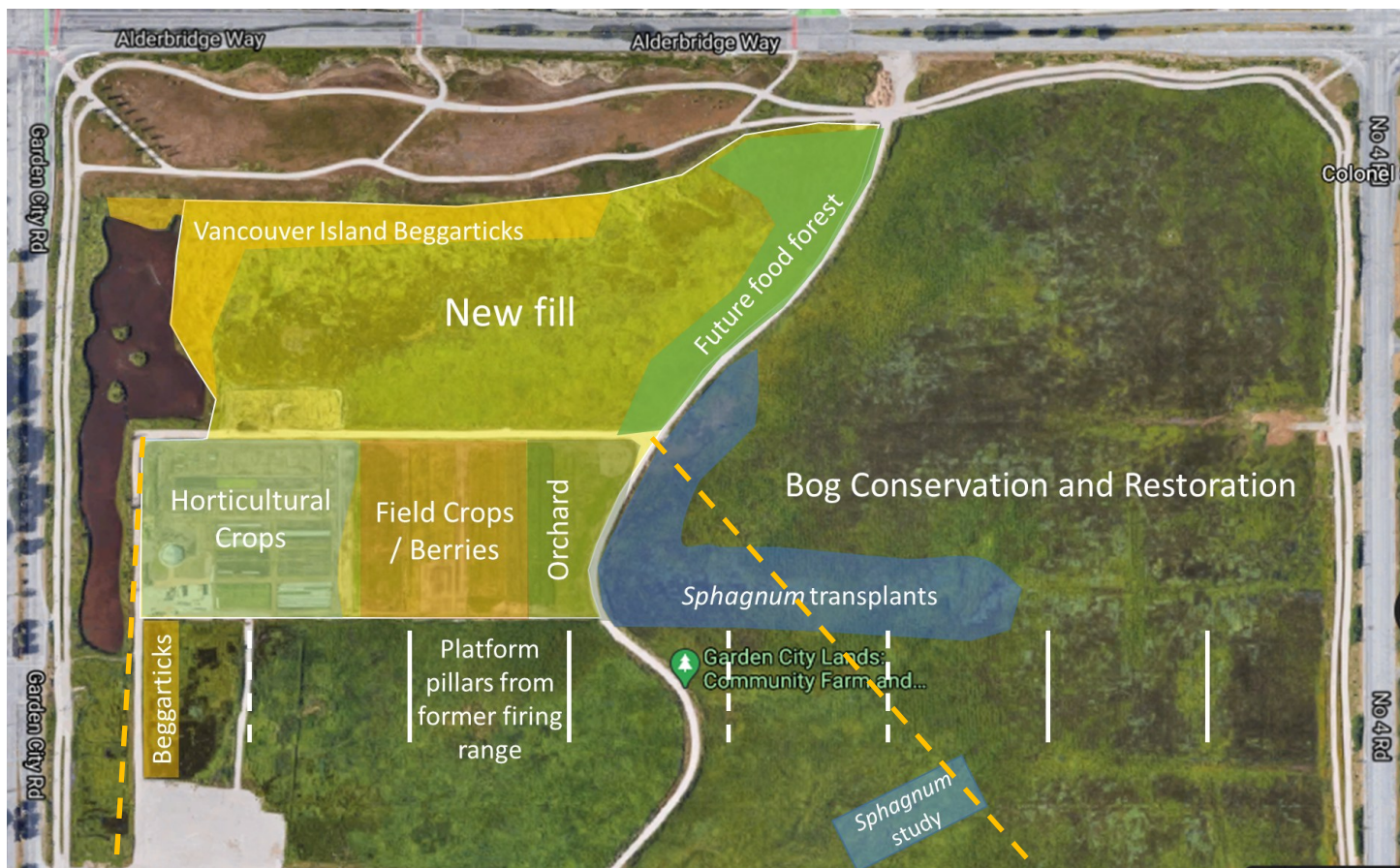
- In 2024 we harvested 15 metric tonnes of certified organic produce from the site, with a retail value of 102 thousand dollars. This was sold at a Tuesday afternoon Kwantlen Farmers' Market at Minoru Plaza, through a variety of wholesale channels, or donated to the Richmond Food Bank.
- The construction of the storage shed to facilitate safe storage for equipment on the farm.
- The KPU Farm was awarded a \$50,000 grant from the Y.P. Hueng Foundation to fund the installation of walk in cooler.
- Our volunteer program was expanded and provided opportunity for many students and community members to participate in events and crop production on the site.

We are grateful for the partnership with the City of Richmond that allows the KPU Farm at the Garden City Lands to teach and demonstrate community-engaged sustainable agriculture.





# Farm Maps—2024



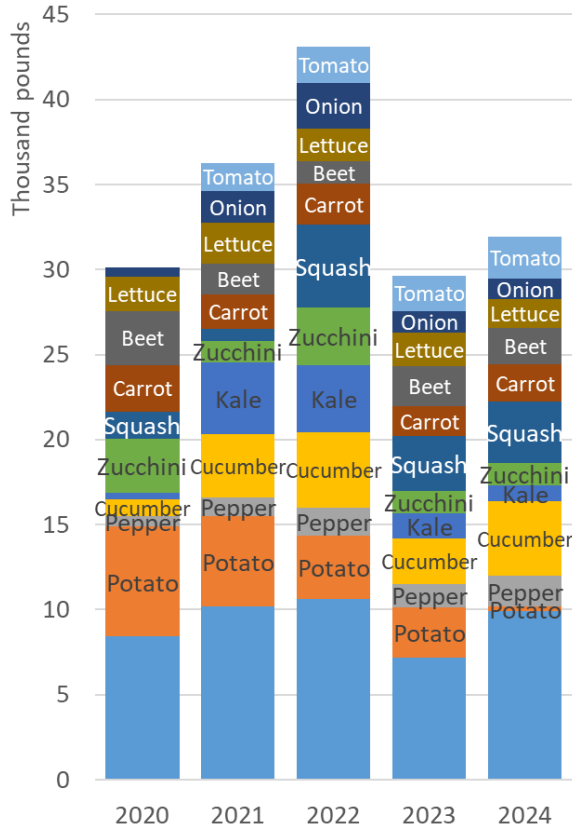
# Crop Production

The KPU Farm at the Garden City Lands produced 32 thousand pounds (15 metric tonnes) of certified organic vegetables in 2024, with a retail value of 102 thousand dollars. Yield was just 6% higher than 2020, but crop value was 34% higher. More than 40 different crops were grown. The 10 most productive are shown by the coloured slices in the Crop Yield bar graph below.

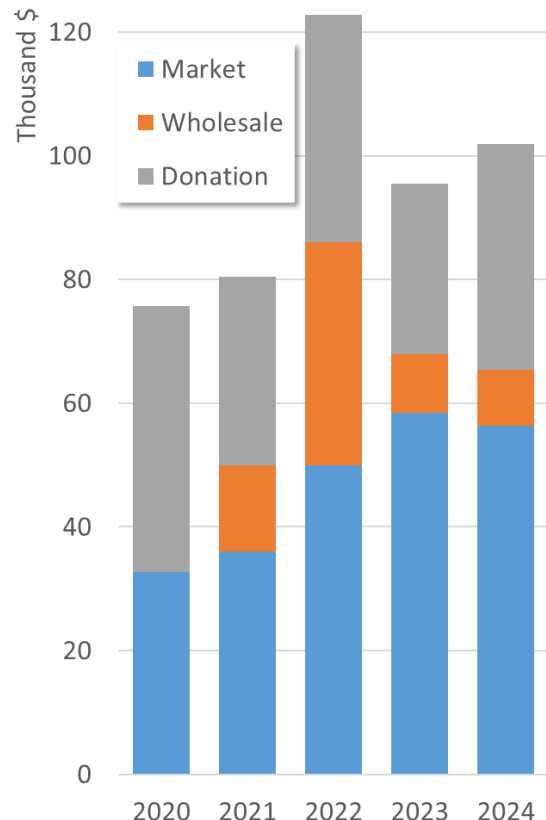
The harvested produce was either sold or donated, as shown in the Crop Value bar graph below. The Richmond Food Bank accepted almost 24 thousand dollars worth of produce donations in 2024, bringing the value of donations since 2020 to more than 160 thousand dollars. In addition to donations to the food bank, over 12 thousand dollars worth of produce was provided to the community through the community fridge and the student food security program. Sales in 2024 totaled 65 thousand dollars, with 56 thousand dollars in direct sales at the Kwantlen Farmers' Market, and nine thousand dollars from wholesale distributors that prioritize local organic produce, including Discovery Organics and the Spud. Overall sales were similar to 2023 but lower than 2022, with wholesale sales showing no recovery.

Tomatoes were the top-selling crops at the Farmers Market, while cucumbers led wholesale crop sales.

## Crop Yield



## Crop Value



Crop yield by weight (left) and dollar value (right) from 2020 to 2024. Yield bars are divided to show 10 most productive crops. Value bars are divided to show distribution between direct-market sales, wholesale sales, and donations.



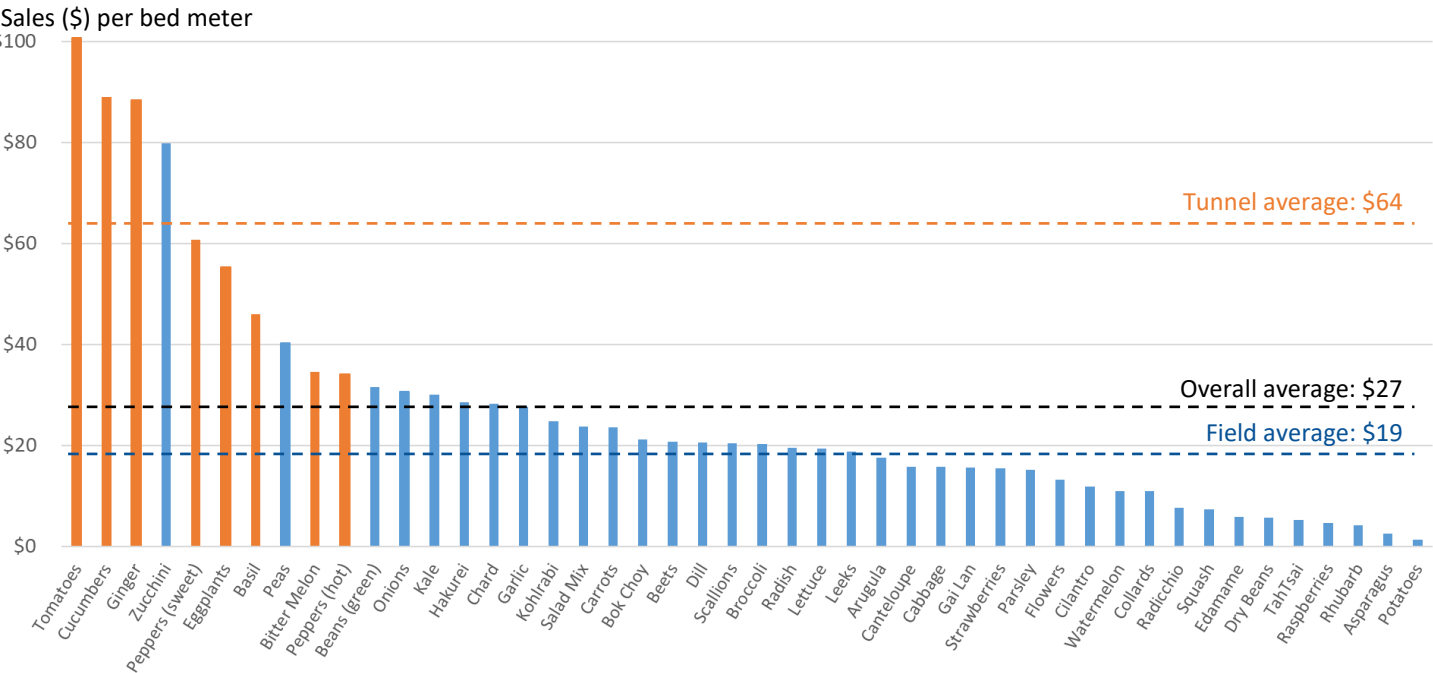
Small farm production types at the Garden City Lands include movable high tunnels, market garden plots and field plantings. High tunnels facilitate in-ground production with added protection creating warmer environments. These tunnels allow for early season spring production and late season fall production as well as warm season crops throughout the summer (top image: peppers planted in 20 m beds).

Market gardens are diverse plantings which require intense management and are high producing fields (middle image shows carrot and beet planting, 30 m beds).

Field crop zones (bottom image, 100 m beds) provide large spaces for crops that require lower labour and increased space and are positioned further from the entrance hub in the southwest corner of the farm.



Below: Farm income per bed meter by crop variety for 2024. Orange and blue bars denote warm season high tunnel and outdoor field beds, respectively. Orange and blue dashed lines show the average income per bed meter for high tunnel and outdoor field beds, respectively. Income does not include value of donated produce.





# Perennial Plantings

## Tree Fruit Orchard

The high density planting of fruit trees had a row of apples added to the planting. This leaves two more rows to be planted which will occur over the next two years in order to have a range of tree ages available . A student research project was carried out in the first row to evaluate different orchard floor management strategies in including living mulches (clover, nasturtium, and alyssum), bark mulch, and no cover (bare soil).

In the fall of 2024 the orchard area was expanded with a variety of free-standing fruit trees. Additional trees will be added in coming years. The trees include several varieties of apples, pear, persimmon, cherry, hazelnut and cherry.

## Perennial Hedgerow

Non-crop areas are an important aspect of agroecosystems management which provide biological diversity and habitat. Beetle banks were established at the KPU Farm in 2019 and the perennial grasses have provided habitat for ground beetles. The wildflowers planted in these areas have provided an impressive display for the community attracting photographers and admirers in addition to feeding many insects on the farm. However, there are several invasive species including Hedge Bindweed (*Convolvulus sepium*), Himalayan Blackberry (*Rubus armeniacus*), thistles (*Cirsium arvense*, *Cirsium vulgare*, *Silybum marianum*), Reed Canary Grass (*Phalaris arundinacea*), and others that have begun to establish in these areas. As the population dynamics of these areas changes, the management practices also change and in some areas require a shift away from perennial grasses to woody perennials. In the coming years there will be increased focus on native woody perennials.



Students plant fruit trees in the orchard.



Orchard floor management trial (left), wildflowers in the beetle bank (center), beetle banks along the north edge of the field where new management for invasive species will be implemented (right)



# Student Research

KPU Sustainable Agriculture students completed eight research projects at the Garden City Lands in 2024.

Student	Project	Key result
Kayla Buttress	Effects of flax variety and planting density on seed and fibre yield	Flax yield increases with seeding rate. Grow 'Marilyn' cultivar for fibre and 'Linore x Agatha' for seed.
Tobias Carl	Interaction between biochar amendment rate and feather meal fertilizer application on cabbage growth	Biochar amendment did not increase cabbage growth or chlorophyll content.
Sylka DiBiase	Coconut coir as potting soil alternative to peat: Biochar, wool pellets, and wollastonite as soil amendments	Kale seedlings grew better in a blend of peat and coconut coir than in the pure peat or coconut coir.
Naomi Mallare	Effects of biostimulant and mycorrhizal inoculant applications on dry direct-seeded rice	Dryland rice production was enhanced by Gaia Green fertilizer, but not by Mykos Gold, Yeast Guard, or Tecamin MAX biostimulants.
Talia Parfeniuk	The effect of layering soil over degraded peatlands on carbon dioxide emissions	A layer of mineral soil over disturbed peat reduced soil respiration.
Naomi Waite	Trialing edamame varieties and mulch in Richmond, B.C.	Mulch enhanced edamame survival and yield.
Francisca Weeks	Impact of in-row living mulches on tree growth, soil moisture and weed management in an organic high-intensity apple orchard	Microclover living mulch established rapidly in orchard rows to inhibit weeds and retain soil moisture.

Project results were presented at the an annual student research symposium, jointly presented by KPU's Departments of Sustainable Agriculture and Physics, and at a KPU research showcase. Student posters and papers are available at [www.kpu.ca/agriculture/student-research](http://www.kpu.ca/agriculture/student-research).

Left to right:

Digester; gas exchange measurements in peat; cabbage pots; weighing rice





# Student research highlight: A better way to fill

KPU student researcher Talia Parfeniuk measured carbon dioxide emissions from bare peat and from peat covered by 80 cm layers of imported soil. She compared four imported soil layer treatments:

1. 80 cm of mineral soil;
2. 40 cm of mineral soil over 40 cm of peat;
3. 80 cm of peat; and
4. 40 cm of peat over 40 cm of mineral soil.

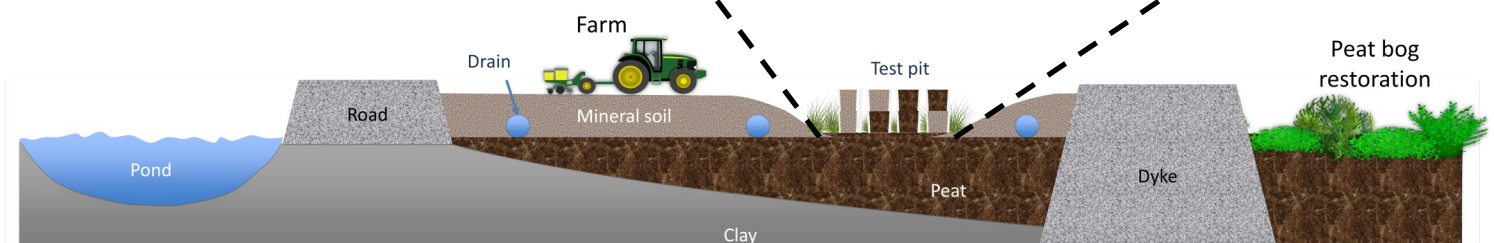
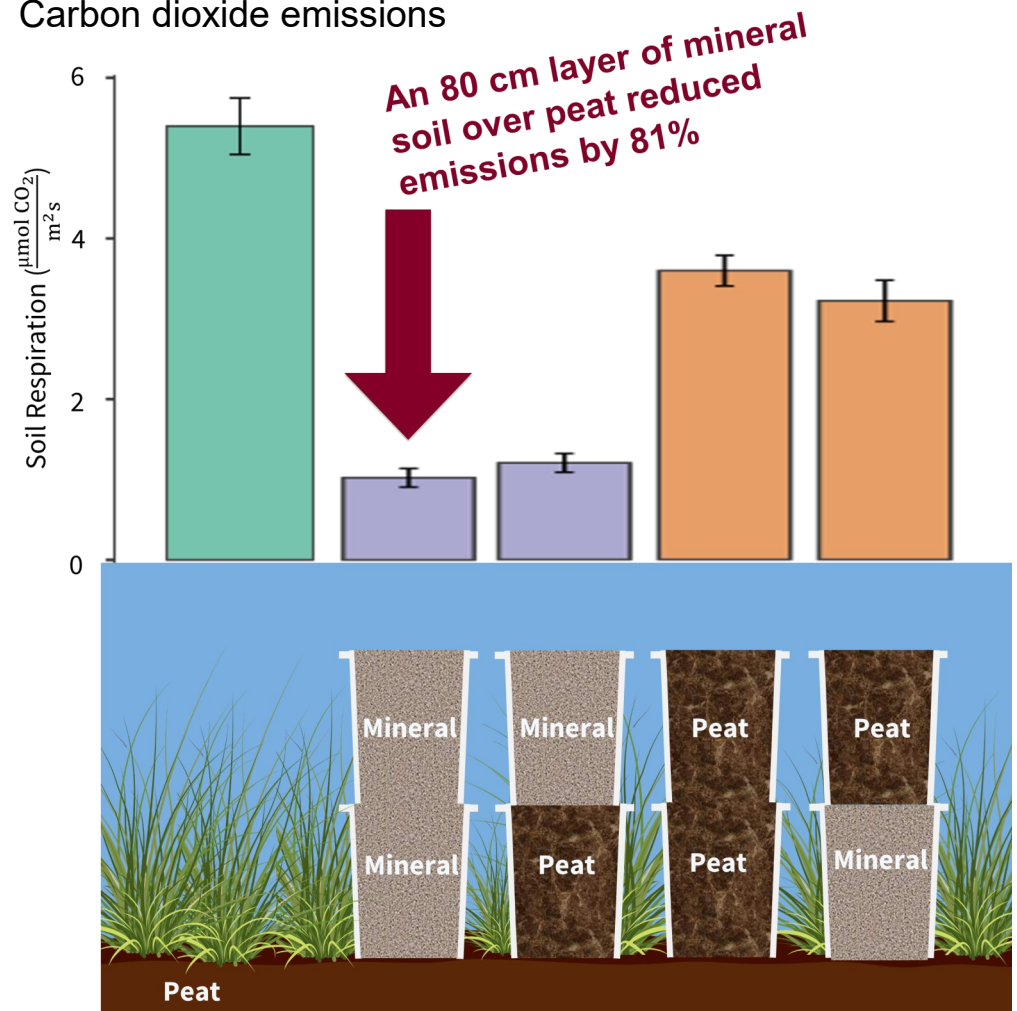
Treatments were randomized within four replicate blocks.

Carbon dioxide emissions were highest from bare peat (green bar) and lowest when mineral soil was placed above peat (purple bars).

An 80 cm layer of mineral soil layered over peat reduced carbon dioxide emissions by 81%.

The study suggests that peat 'salvage,' in which upper layers of native peat are stripped and layered over imported soil fill, likely increases carbon dioxide emissions. A better practice is to layer soil fill over native peat. This approach offers a quick solution to reduce Richmond's agricultural carbon dioxide emissions.

Carbon dioxide emissions





# Celebrating Community Partners

## KPU Farm Open House

On July 18, 2024, the Sustainable Agriculture Department hosted its annual open house at the KPU Farm to connect with community members, partners, alumni, and students. The event provided an opportunity to express appreciation, share updates on current projects, and strengthen relationships with collaborators. Attendees included representatives from government, the non-profit sector, the agricultural industry, and education. It was a successful day of knowledge sharing, community building, and enjoying refreshments prepared by students and volunteers.



## TD Bank Employee Appreciation

In 2023, KPU received a generous grant from TD Bank in support of sustainable agriculture education and community engagement. To recognize this valued partnership, staff from two TD Bank branches joined the KPU Farm team in March 2024 for an employee appreciation day. Participants learned about sustainable farming practices through hands-on activities and were invited to take home garden transplants, seeds for their own gardens, and a bag of fresh organic produce grown at the KPU Farm.





# Learning Garden & Community Outreach

## Richmond Public School Visits

In February, the KPU Farm faculty and staff, visited Henry Anderson Elementary School to teach students about the unique properties of willow and how it can be used to create living structures. A week later, two classes visited the farm to help build a willow dome in the Learning Garden. Later in the spring, two additional classes transplanted bean seedlings they had started at school into the garden. Over two more visits, one of the willow dome classes returned to learn about food systems, ecosystems, and pollinators, culminating in a “Pollinator Picnic”, where students shared pollinator artwork and poetry and joined a tasting tour exploring different crops and flavours.



A teacher and student building a willow dome in the KPU Learning Garden.

## Community Volunteering

Now in its third year, the **KPU Farm Volunteer Program** ran from March to November and involved up to 19 volunteers who visited the KPU Farm every week. Many participants were newcomers to Canada, creating a diverse group eager to share their agricultural knowledge and experiences. Volunteers supported community learning about food systems by attending events, helped maintain a wide variety of flowers, vegetables, fruits, and herbs, in the Learning Garden, and assisted with harvesting produce for the Kwantlen Street Market and the Richmond Food Bank. All of the produce grown in the Learning Garden was either used for community workshops or donated to the volunteers.





# Learning Garden & Community Outreach

## Giant Pumpkin

The KPU Farm grew a giant pumpkin in the Learning Garden from award-winning seeds. Weighing approximately 300 kg, the pumpkin was donated to the City of Richmond for its Halloween event in October. Community members were invited to visit the Learning Garden, follow the department on Instagram (@kpuagriculture) and post a photo with the hashtag #kpugiantpumpkin for a chance to win a bag of fresh organic produce. This pumpkin was a fun way to engage with our community and encourage people to visit the learning garden.

The KPU Sustainable Agriculture Department also attended the Halloween event with a display featuring creative alternatives to pumpkin carving and showcasing the many delicious ways to cook squash.



Giant pumpkin at full size.

**ENTER TO WIN!**

**KPU FARM**

**GIANT PUMPKIN**

Enter our draw to win a bag of organic seasonal produce from the KPU Farm!

TO ENTER THE DRAW FOLLOW THESE STEPS

**FIRST:** Follow us on Instagram at @kpuagriculture

**SECOND:** Add a picture of our pumpkin with the hashtag #kpugiantpumpkin

If you do not have an Instagram account, please send your best picture of the pumpkin to [kpufarm@kpu.ca](mailto:kpufarm@kpu.ca) to enter

The winner will be chosen on October 25th, 2024

Advertisement for the giant pumpkin photo contest



KPU Farm display at the City of Richmond Halloween Event. KPU staff and volunteers provide education for visitors about the different types of squash that grow in our region and how you can prepare them.



Richmond News highlighting the KPU Giant pumpkin. Photo entry in the contest, Anabelle Wee.

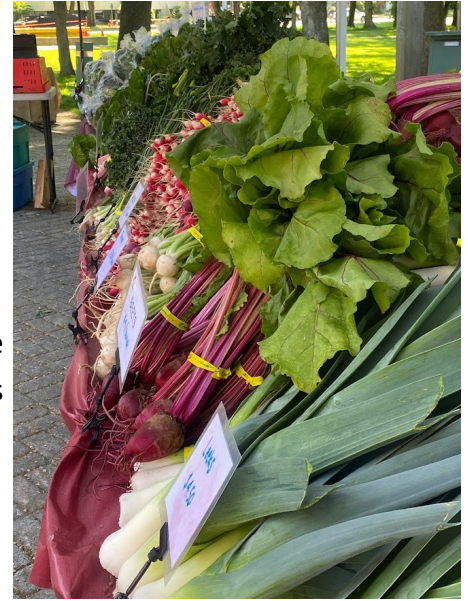


# Community Engagement

## Farmers Market

The Kwantlen St. Market which occurs weekly on Tuesday afternoon (12-4 pm, April-November) remains a critical part of our program. The market is located in Minoru Plaza in the heart of many other important community amenities.

The market continues to be an important connection with our customers and it provides our students with an excellent learning opportunity. As the Kwantlen St. Market is a member of the BC Farmers Market Association, as a vendor, we are able to partner with the BC Farmers Market Nutrition Program which provides farmers' market coupons to lower-income families, pregnant people and seniors.



## Twilight Tours

The annual Twilight Tour series, held on the second Tuesday of each month, continued in 2024. These public tours invite people of all ages to explore the KPU Farm, engage with the space, and learn about ongoing projects and research. From June to October, tour themes included Bog Vegetation, Summer Flavours, Fibers of the Farm, Seed Saving, Fruit Production, and Fall Flavours. This year, several members from the Community Garden on Garden City Lands joined a tour to learn more about the work taking place at the KPU Farm.



## Social Media

We have utilized social media extensively to share with the community about what is going on at the farm. Our students and staff contribute to the stories that we tell. This has been an important tool to let people know what we are about and what we are doing on the farm! Check us out at KPUAgriculture on Instagram and Facebook.

## Community Fridge & Richmond Food Bank

Fresh food donations with a value of over \$24,000 was donated to the Richmond Food bank and other food insecurity programs. The Sustainable Agriculture Student Association has volunteered their time to provide produce to the community fridge, which provides low barrier access to fresh produce to the community as well as the food insecurity program with the Kwantlen Student Association.



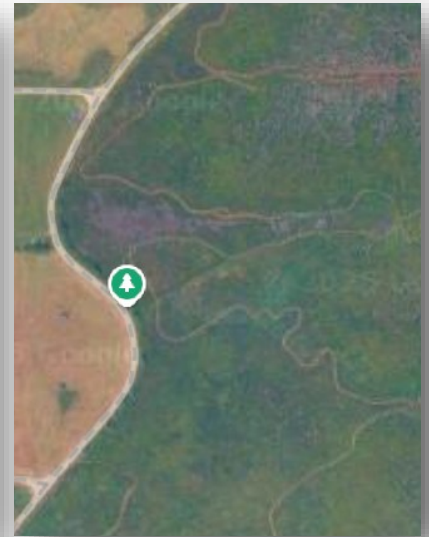
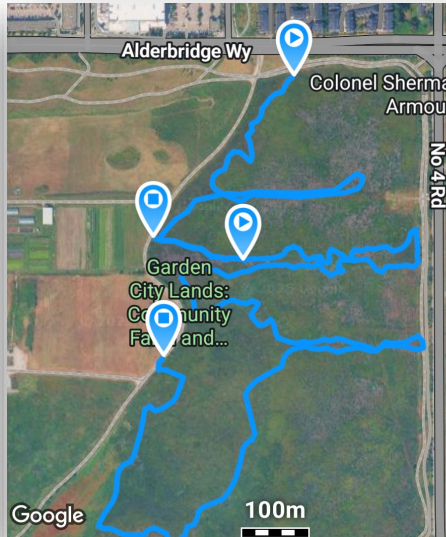
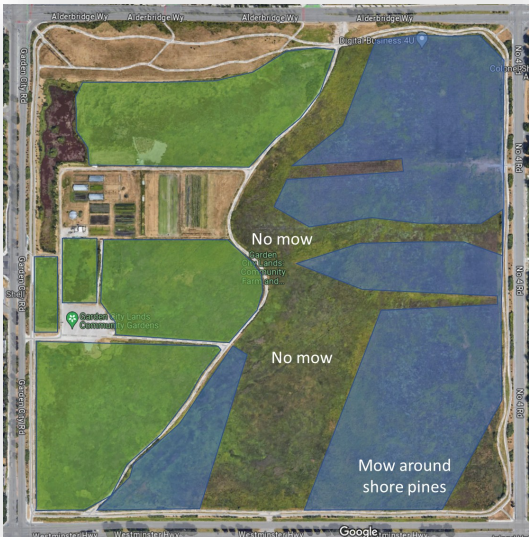
# 2024 Mowing Plan

Indigenous people probably managed trees and favoured berry bushes and medicinals using occasional controlled burns in the Lulu Island bogs. The first recorded description of the Garden City Lands is of “a cranberry swamp with low pine bush mostly deadened by fire” (Joseph Trutch, Royal Engineer surveyor, 1859).

Settlers drained the peat by building ditches and roads through the bog, creating a fire hazard and favouring tree growth. Numerous peat fires occurred in the 1930s and 40s. To prevent fires, the Lands were cleared and regular mowing began. Both the Garden City Lands and the adjacent lands owned by the Department of National Defense (DND) were mowed regularly until the mid-1970s, when mowing ceased on the latter. The DND lands have since become forested. A serious peat fire occurred there in the summer of 2017.

Annual mowing continues on most of the Garden City Lands. The 2024 mowing plan was refined by City Staff and KPU to reduce fire hazard and promote native bog plants:

1. Agricultural zones west of the dike were mowed first (mid-September).
2. The eastern portion of the bog was mowed next (late-September). Flagged lodgepole pines, lagg zones and most areas with *Sphagnum* were left unmowed. Unmowed areas had very few silver birch, posing little risk of reforestation or fire.



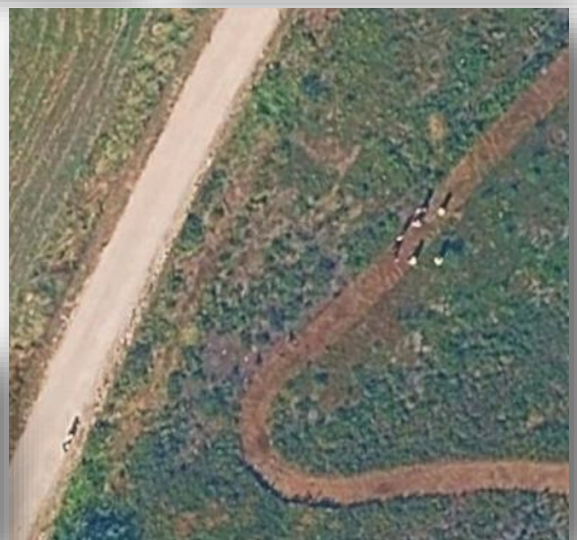
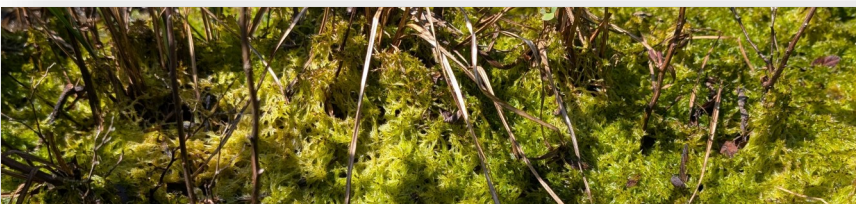
Above Left: 2024 graduated mowing plan, developed in collaboration with KPU.

Above Center: GPS tracing of line mowed by KPU to divide mowed from unmowed zones, based on observed presence of silver birch.

Above Right: Mowed line visible on current Google Earth satellite imagery.

Right: KPU bog tour participants visible on the mowed line in current Google Earth satellite imagery.

Below: *Sphagnum* moss and other native bog plants advanced rapidly in unmowed areas of the Garden City Lands.





# Farm Expansion and Next Steps

## North Field Expansion

KPU continues to collaborate with the City of Richmond in the development of the North Field. As with the south field, the peat will be buried beneath clean mineral soil with the drains positioned above the peat. This strategy is intended to preserve the sequestered carbon in both the native peat and the imported peat that was added in 2022, avoiding substantial greenhouse gas emissions. Additional soil was brought to the site but there is still more soil needed to bring the site up to agricultural capacity. The completion of this project is limited by the availability of soil in Richmond. As in previous years, KPU has managed this area by planting cover crops when possible.



Top left image: Water present on the fields in spring. Top right image: mineral soil is amended with compost at the time of deposition. Bottom image: trucks delivering compost.