University of the Fraser Valley Food and Agriculture Institute | Archway | PHABC | Farm to School BC

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VERTICAL AGRICULTURE IN NOT-FOR-PROFIT CONTEXTS

Guiding responsible innovation in the province of British Columbia

Prepared by the Food and Agriculture Team and project collaborators

SUMMARY

Opportunities

- Enhanced teaching and learning spaces
- Increased student engagement and attendance

Challenges

- Over-reliance on individual champions
- Need for more flexibility in services and financing from equipment manufacturers

OBJECTIVES

This summary document presents the high-level results from the third of a series of workshops to connect atypical agriculture stakeholders.
The goals of this workshop series are to facilitate collaboration, identify hurdles for agri-food technology development, reduce barriers of entry into vertical agriculture production, and establish groundwork for future connections for the atypical agriculture sector.
This research aims to support an environmentally, economically, and socially desirable direction for atypical agriculture, advancing more responsible agri-tech innovation pathways in partnership with industry, government, community food organizations, and members of the public.

For this work, we define atypical agriculture as practices involving indoor, vertical, controlled environment growing of vegetables, culinary herbs, mushrooms, fruits, and berries.

The goal of this final workshop from the series was to assess the opportunities and challenges for atypical agriculture development in not-for-profit settings.

APPROACH

In Summer 2025, the FAI research team hosted an online workshop with educators, community food organizations, as well as not-for-profits currently using (or planning to use) vertical grow equipment in their work and community settings. The workshop included three presentations from practitioners and researchers in school and not-for-profit settings who are using indoor growing technologies.

The research team asked participants to consider the opportunities and challenges they have experienced, reflecting on gaps in services provided by equipment manufacturers and companies.

Figure 1. Shipping container farm. Image sourced from Seacan Guy

TYPES OF OPERATIONS

Participants were experimenting with a range of operational types and grow system infrastructures. These range from home made hydroponic systems and lower cost grow towers, to shipping container farms in the $200,000+ range.

The key goal of participant projects was often described as 'educational'. Some projects were meant for revenue generation and medium-scale production.

> *...we produce over 350 heads of lettuce a week out of our [shipping container unit]...And we run our harvest as a subscription based bin in to our staff...that money goes into a bank account that is accessible by our Parent Advisory Committee who are the key players that orchestrate a [once-per-month] lunch program that feeds our entire student population in one-go [Educator 1].*

> *We've typically used grow towers...Now we're starting to look more into the vertical walls and the contained units that aren't necessarily in a sea can but are built into a shed [Educator 2]*

Figure 2. Grow Towers in School Setting. Image sourced from Our Canada Project

CHALLENGES EXPERIENCED BY GROWERS

Figure 3. Grow wall unit. Image sourced from Canva.

There were several key challenges identified by research participants. A key challenge has to do with lack of institutional or industry support, where project implementation relies upon individual champions. Additional difficulties include sourcing materials and scaling to feed more students, where the goal of the project is for food provisioning or revenue generation.

> *We've been typically using [grow towers], but we're finding that they're not really meeting the needs of what we're trying to do from a volume perspective [Educator 2]*

> *That is a missing gap for us, when we reflect on our experience, is being able to have some of those basic tools to kick us off in the right direction without months of trialing and trying to figure out what's going on and realizing we had the completely wrong fertilizer to start with [Not-for-Profit Farm].*

> *What we found is in some of our school locations the [grow units] become abandoned in a storage locker... as that [passionate] employee moves on or loses their passion, it can be a real struggle to find somebody else to take it over (Educator 2).*

> *...I had a hard time, for example, ordering from a company who was ordering their stuff from companies in the United States to ship all the way across the country, when I could just drive my car five minutes down the road to the hydroponics store [Educator 1].*

OPPORTUNITIES AND BENEFITS

The key benefit of indoor grow systems that workshop participants described was the enhanced opportunities for socialization they provide. This was across the board, for all grow system types (grow towers, grow walls, advanced shipping container units) as well as in not-for-profit versus school contexts. One educator also emphasized that their grow system attracted students to school who were otherwise commonly absent from classes.

Food provisioning benefits were not commonly discussed, where most scales of grow system were insufficient to continuously provide vegetables to students.

> *...if [the students] get time in the farm, they came to school. So just the [grow system] environment itself was the was a comfortable place for them to be in [Educator 1].*

> *We get about 6-7 months of winter, and I'm in a very old school that does not have windows. What I have found is that students will come to my classroom at lunchtime, sit down and eat lunch, not touch the system. They don't mess around with it. They just like being around and they constantly ask questions [Educator 3].*

RECOMMENDATIONS

I think [one participant's] words about starting off DIY is a great starting point, so that you're not necessarily stuck with some turnkey system and can get used to production (Academic).

...These companies need some flexibility in what they're offering, like tiered services. If you only need the training side of it and not the material side of it, vice versa (Educator).

Two key recommendations were advanced during the workshop. Participants suggested that small-scale, do-it-yourself experiments could be a good starting point before larger scale capital investments, that may be riskier for school or not-for-profits.

Additional flexibility on the part of companies could also support their customers, who may seek alternative suppliers, financing models, or have divers system needs.

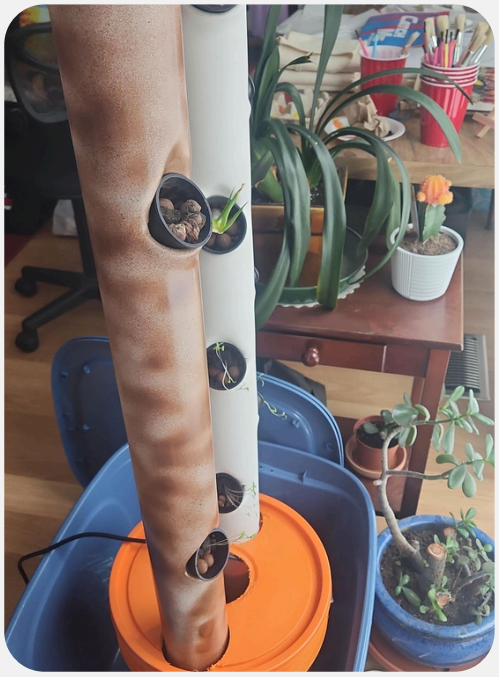

Figure 4. DIY vertical farming system. Image sourced from previous workshop participant.

Projects rely on individual champions with limited support 1

- With some exceptions, school and not-for-profit projects rely on individual teachers and staff to spearhead procurement, maintenance, and programming. This makes projects vulnerable to staff disruptions.

There is a tradeoff in function and scale within not-for-profit and school settings 2

- Larger-scale shipping container farms may contribute more to feeding students, but rely on significant capital expenditures. Smaller scale units promote socialization and education, but lack food production benefits.

Flexible services and proper planning will support project success 3

- Tiered, customizable services for not-for-profits and school as well as room for low-stakes experimentation would likely drive more successful project implementation.