UBC Social Ecological Economic Development Studies (SEEDS) Student Report

Diversity of Food Plants in UBC's Community Gardens

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III. EXECUTIVE SUMMARY

With climate change causing massive shifts in the availability of arable land, sustainability organizations worldwide are looking towards agricultural biodiversity as an important facet of food system sustainability. Our study investigated the status of community agriculture at UBC with the aim of developing a baseline understanding of campus biodiversity, which can then be used to advise the UBC Botanical Garden's efforts in promoting biodiversity and developing a community garden strategy.

Using Community-Based Action Research principles, we surveyed 27 community gardeners and interviewed 6 community garden managers to document the diversity of food plants in community gardens, investigate contributing factors to biodiversity, and to develop a brief profile of the goals and needs of each community garden.

From survey results, we found that out of the 46 food plants presented to participants, 42 are present on campus. An additional 19 varieties of food plants were listed by participants, bringing the campus total to 61 varieties. Of these 61 varieties, 82 different cultivars were named.

From interview results, we found that there is a large diversity of community gardens at UBC. Gardens differed not only in size, but in their administration and organization, which affected their needs. For example, student gardens tended to need funding while institutional gardens experienced issues with administration.

We also noted that the diversity of food plants grown on campus may be affected by the academic calendar at UBC. Gardeners show a strong preference towards planting fall and spring food plants, which are the main academic seasons. Additionally, many students are away during the summer months, which may contribute to decreased food plant diversity and participation in some gardens.

We found that the primary motivator for both gardeners and gardens was social interaction. Community gardens on campus strive to host social events as community hubs while gardeners prioritize enjoying themselves in the garden over food production. The preference for social interactions in community gardening (especially for agricultural knowledge acquisition) serves as a favourable delivery point for the promotion of agricultural biodiversity in community gardens.

Through our findings, we have concluded that the UBC Botanical Gardens can best support the community gardens on campus by providing workshops and social events that will increase agriculture knowledge and in turn, boost food plant diversity on campus. These workshops will aid community gardens in providing social events for their gardening and facilitate a way for individuals from different community gardens to socialize and share gardening knowledge. In addition, we recommend that UBC Botanical Gardens establish a platform accessible by all community gardens to share and promote gardening knowledge, resources and social events.

IV. INTRODUCTION

The aim of this project is to create a baseline understanding of food plant biodiversity and agricultural knowledge within the UBC community gardens. The results of this project will then provide recommendations for the UBC Botanical Garden through which they can provide support for these community gardens.

Sustainability is one of the core initiatives at UBC, and our project will be able to address the food system and biodiversity components. Sustainability is defined as the ability to meet the needs of the current generation, without compromising the needs of future generation (Brundtland Commission n.p.). This concept has three main pillars: environmental, social, and economic (Hansmann et al. 451). For the scope of our project, we will be focusing on the environmental and social sustainability aspects in community gardens. The environmental pillar will be addressed in our project by creating an inventory of food plant biodiversity within each community garden, which will allow the UBC Botanical Garden to provide support in diversifying the cultivated species across campus, thereby increasing the local ecosystem resilience. The social pillar will be addressed by understanding how community gardeners gather and share their agricultural knowledge, which will allow the UBC Botanical Garden to help facilitate workshops if required, as well as develop an inter-garden communication network.

In the global context, agroecosystems have faced a loss of food crop diversity in recent years, which has been exacerbated by monocropping practices in industrial agriculture (Horrigan et al. 446). Biodiversity is an important factor in a well functioning ecosystem, such as an agricultural system, as it provides multiple ecosystem services (Kremen and Miles n.p.).

A critical service that biodiversity provides to an agroecosystem is ecosystem resilience, the ability to recover from a disturbance back to its original functional state (Kremen and Miles n.p.). Therefore, access to a diverse range of crops will allow farmers and gardeners to select plants that perform well in their local environment. This ability to select well-performing plants is particularly important in the current context of global climate change, in which it is predicted to bring more extreme disturbance events (Jentsch & Beierkuhnlein 622). In addition, increasing plant diversity can lead to diversification of habitat spaces for invertebrates, and increase food security and sovereignty by increasing access to ethically important foods (Clarke & Jenerette 638; Goddard *et al.* 263).

The objectives of this project are to: (1) Catalogue the diversity of food crops planted in community gardens at UBC to create a baseline for agrobiodiversity, (2) Identify contributing factors of biodiversity such as income, motivation, experience, etc. and (3) Synthesize a profile for each community garden that contains contact information and organizational information.

V. METHODOLOGY AND METHODS

We employed a Community-Based Action Research (CBAR) methodology in our study design, incorporating direction and input from our stakeholder, UBC Botanical Gardens, to ensure that they had an active voice in our research process. Under CBAR principles, we acted as facilitators, securing informed consent from our community garden partners to be an active participant in our project. Our overall goal was to characterize the state of community agriculture and we split this research objective into two separate questions and employed two different methods of data collection to address them.

Using a survey, we examined the demographics, motivations, and levels of agricultural skill of individual gardeners and attempted to correlate them with their levels of biodiversity to answer the question: *What influences the biodiversity of community gardeners?* Using semi-structured interviews, we collected information on the history, administration, goals, and needs of community gardens to answer the question: *How does the structure and purpose of a garden determine its goals and needs?* Taken together, the objective of our research methodology was to identify ways in which the Botanical Garden could increase biodiversity on campus through community garden support.

Survey Design

Survey data collection was performed using the UBC Survey Tool, an online survey platform powered by Qualtrics. The Qualtrics survey system was selected as our gardener data collection tool because of features such as conditional question logic and unusual question formats which significantly shortened the survey. Additionally, hosting the survey online allowed us to distribute the survey without the requirement of a researcher administering each survey, allowing for greater reach of the survey and ease of access for participants.

The survey itself consists of 3 question blocks: Demographic, Agricultural Information, and Biodiversity.

The Demographic block captures information about the participant that previous literature had indicated may be relevant to biodiversity, such as income, age, and ethnicity. We selected income and age brackets based on expected divisions between students, early professionals, and late-career professionals. As these may be sensitive topics, all demographic questions gave participants the ability to opt-out of answering the question.

The Agricultural Information block captures information about a participant's gardening experience, sources of seed, sources of knowledge, motivation, and community garden affiliation. To capture information about motivation, we selected 7 common values that a gardener might have (as well as an 'Other' category) and asked participants to list the value's importance on a scale of Very Important to Not Important. The knowledge source and seed source sections were simple multiple-choice questions from a selection of common sources.

The Biodiversity block was the longest section and consisted of several 'highlight' questions that asked participants to click on the vegetable types that they planted from a provided list. To minimize the difficulty of finding any given vegetable, we limited each question group to 11 vegetable types each and presented them in logical groupings. Additionally, to alleviate survey fatigue due to length, we wrote puns for each vegetable type and logical grouping, which we hoped made the survey entertaining enough to complete fully.

The survey was distributed through direct invitation to each garden's manager. We provided a shareable link and research ethics cover letter to the manager and asked them to incorporate it into their next intra-garden communication. This minimized privacy issues associated with researcher access to email lists while still making our research ethics letter available to participants.

The original scope of our survey was 9 gardens, so we set a target of on average 3 responses from each garden for a target of 27 responses. The gardens are extremely variable in size (in terms of number of gardeners) and organization, so rather than establish a standard percentage of the population necessary for sampling, our goal was simply to ensure representation from all gardens.

We planned to keep the survey open for 2 weeks, or from Feb.21 to Mar.2, however some gardens were not able to distribute the survey until 1 week into collection. This delayed final tabulation of results and pushed the overall survey closure time to 4 weeks, or a closure date of Mar.19. Additionally, mid-way through data collection, we discovered and subsequently added 2 more gardens, the Orchard Garden and the Michael Smith Laboratory garden. We considered these gardens to be a welcome addition to our data set, but not a core requirement set out in our proposal, so we did not increase our minimum response threshold to accommodate these gardens or increase the survey length.

Data Analysis

After closing the survey, we analyzed the data to compare relationships between the Demographic block, the Agricultural Information block, and the Biodiversity block.

We used two ecology metrics to analyze biodiversity, alpha diversity and gamma diversity. Alpha diversity, in our study context, refers to the number of 'species' within an individual's garden plot, where 'species' is understood to mean the vegetable cultivars and morphotypes presented to survey participants. For example, cauliflower and broccoli are both members of *Brassica oleracea,* but for ease of understanding they are considered separate 'species' in our study. Gamma diversity refers to the total number of 'species' present in either each garden or in the campus as a total, excluding any duplicate species.

The knowledge source and seed source results were similarly calculated to create metrics of average number of sources per individual (an analog of alpha diversity) and total source diversity (gamma diversity analog).

We exported the survey results from Qualtrics to analyze individual responses using Excel and we used Qualtrics' built-in tools to cross-tabulate results and to generate summaries of data that we used to calculate total diversity metrics.

Interview Design

We aimed to perform semi-structured interviews with garden managers using a script that covered a baseline list of questions. These questions ranged from garden management style to garden needs and priorities and were asked in order to gain an understanding of how the gardens are run (Appendix III: Interview Questions). At the end, we asked open ended questions to allow each garden manager to provide feedback and communicate any important issues that were not asked.

Interview Analysis

Once all the interviews were conducted, we coded key words from interview responses in order to classify them into groups. For example, when looking at garden priorities, all answers to this question from different gardens were clumped together and similar words were extracted. If a garden mentioned "socialization" or "community networking" as a priority we classified the responses as gardens with social priority.

VI. RESULTS

Survey Results

We recorded 27 complete responses to our survey, consisting of participants from 11 community gardens.

Demographics

The majority of our participants were 35-49 year old, Caucasian, females, who identified themselves as community residents, although this was not exclusive with other categories such as UBC faculty or student.

Table 1: Most popular demographics in sample. Age, ethnicity, gender, and self-classification were dominated by single demographics.

Demographic	Most popular response
Age	35-49 (44.83%)
Ethnicity	Caucasian (60%)
Gender	Female (55%)
Self-classification	Community resident (40.74%)

Biodiversity

Out of the 46 'species' options presented to survey participants, the average participant grew 9.5 species in their personal plot.

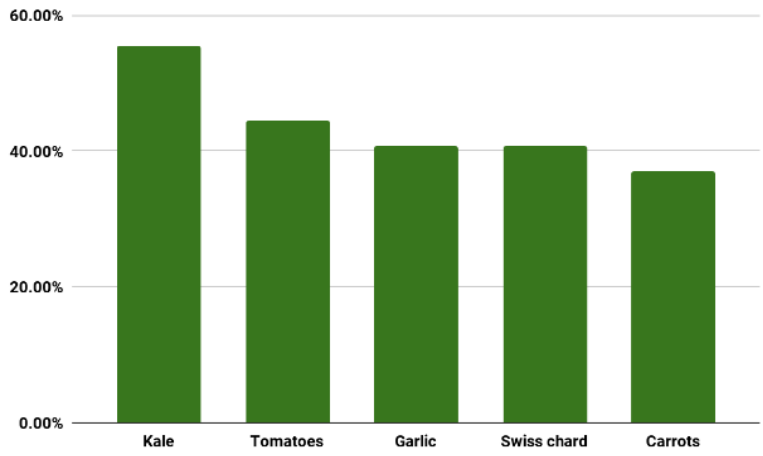

Figure 1: Rank abundance of the 5 most popular vegetables in the survey

The 5 most popular vegetable types amongst survey participants were (in order of abundance): kale, tomatoes, garlic, swiss chard, and carrots (Figure 1). Rutabaga, parsnip, asparagus, and okra were not grown by any participants.

Gamma diversity (total species present out of all survey responses in the group) was calculated per garden. On average, each garden had 15 species present between all responses associated with that garden (Figure 2). The 'garden' with the highest diversity was the UBC Farm, which had 29+ species. The actual diversity is likely higher, but the UBC Farm participant accidentally skipped the Root Vegetables portion of the survey. The garden with the lowest diversity was the Michael Smith Laboratory garden, which planted zero of the presented options.

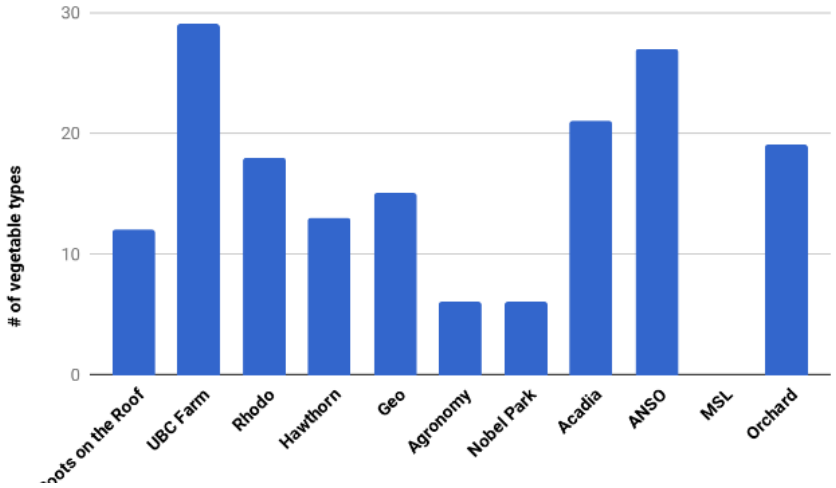

Figure 2: Gamma diversity of gardens.

Motivations

Participants most often (70%) selected 'Enjoyment' as a motivation that was 'Very Important' to them. The other categories were deemed 'Very

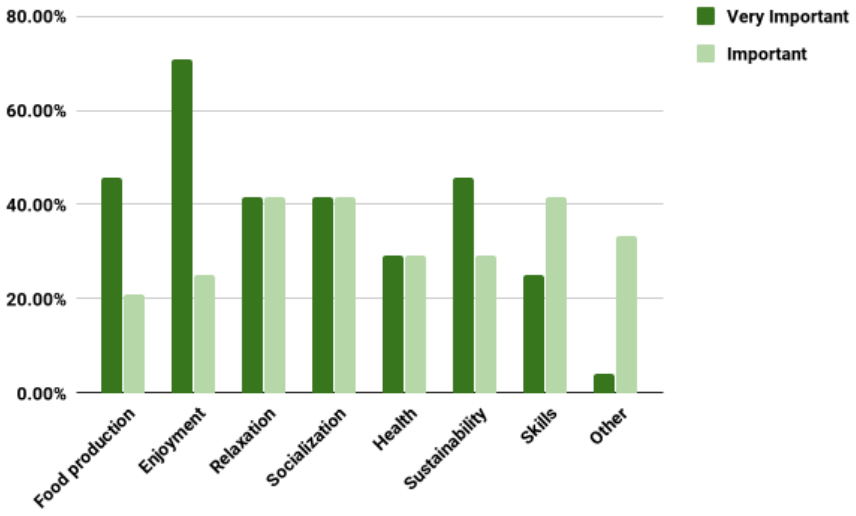

Figure 3: Motivations of gardeners expressed as percentage of participants who value it as Very Important or Important

Important' around 40% of the time, except for 'Skills & Education' and 'Other' which were deemed 'Very Important' 25% of the time and 4% of the time (Figure 3).

Seed Sources

On average, gardeners procured seeds from 2.88 different sources. The most frequently used source is nurseries, which accounts for 21% of our survey responses (Figure 4). This is followed by seed supplier, seed saving, and from friends and other gardeners (19.2, 17.3 and 17.3% respectively). The least used source is the UBC Botanical Garden, which accounts for 1.9% of our survey responses.

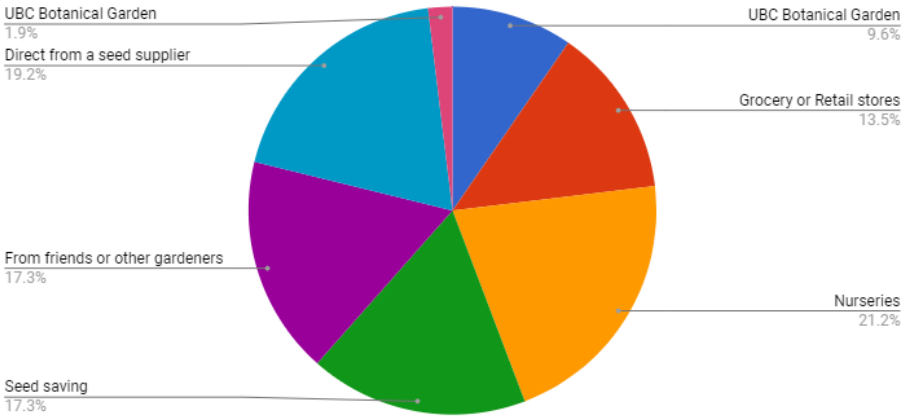

Figure 4. Proportion of seed sources

There is a positive relationship between gardener age and the number of seed sources (Figure 5). Gardeners that are 65+ years old have the greatest number of

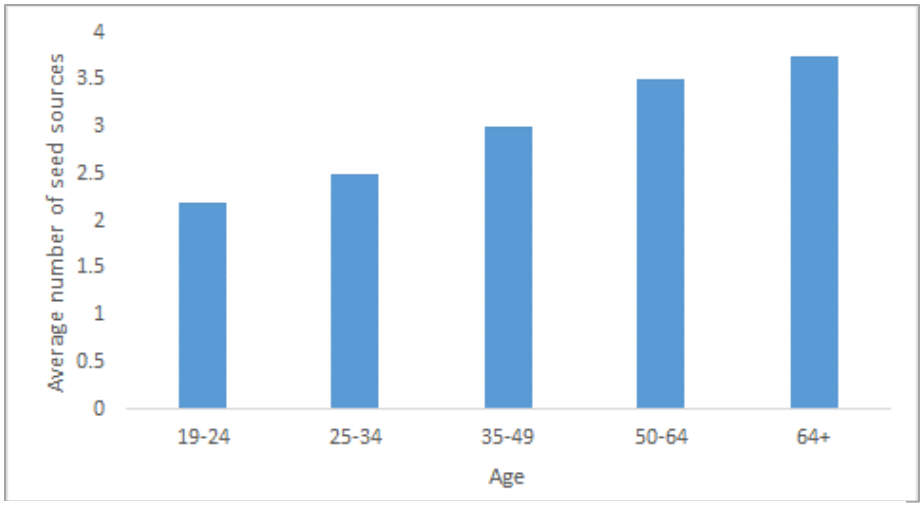

Figure 5. Average number of seed sources compared to gardener age.

seed sources at 3.75 sources. Gardeners that are between the ages of 19-24 years old have the least number of seed sources, at 2.2 sources.

When comparing the average number of seed sources to income, gardeners that have an income of over $100,000 had the greatest average number of seed sources at 3.6 sources (Figure 6). The lowest average number of sources came from those that has less than $10,000 in income, at 2.3 sources.

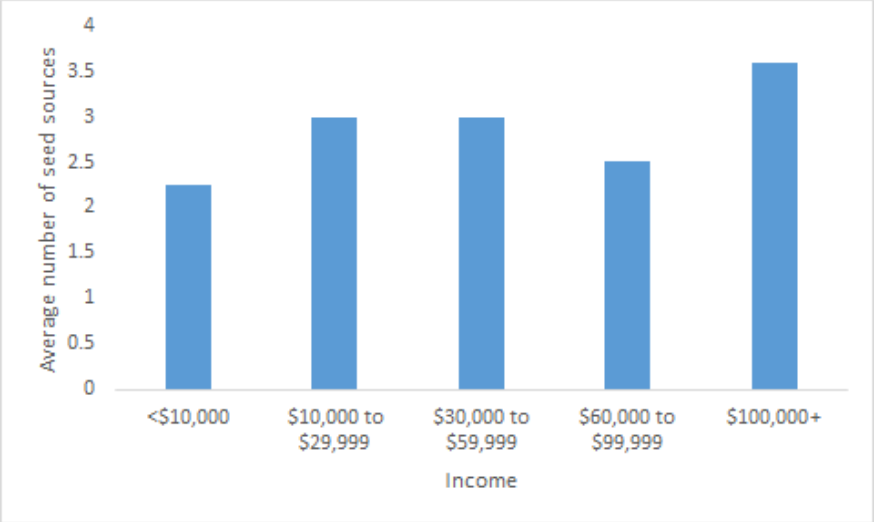

Figure 6. Average number of seed sources when compared to income.

Sources of Agricultural Knowledge

On average, gardeners in our study use 3.70 knowledge sources. Surveyed gardeners rely most heavily on other gardeners (70.4%), back of seed packet (74.1%) and seed catalogs

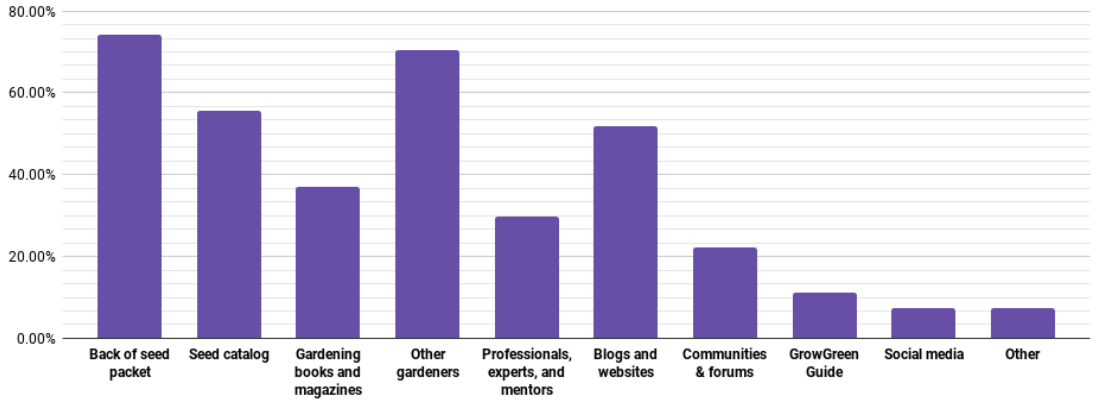

Figure 7. Popularity of knowledge sources expressed as use by proportion of participants.

(55.6%) for their agricultural knowledge (Figure 7). Online sources such as UBC Botanical Garden GrowGreen Guide (11.1%), online communities and forums (22.2%) and social media (7.4%) were recorded as being used considerably less frequently by gardeners.

Figure 7: Percentage of participants that use each source, expressed as a proportion of the total

The average number of sources of agricultural was compared to motivation for gardening, income, and length of gardening experience. There were no large trends present when comparing these factors.

Interview Results

Of the 11 community gardens on campus, we were able to interview 6 of them. We interviewed Acadia Park, Agronomy Garden, ANSO, GeoGarden, Michael Smith, and Roots on the Roof. We used information gathered from these interviews to create a brief snapshot of each garden (Appendix V. Garden Profiles) and a summary table (Table 2).

Table 2. Summary of relevant garden characteristics

	Acadia Park	Agronomy	ANSO	GeoGarden	Hawthorne	Michael Smith	Nobel Park	Orchard Garden	Rhododendron	Roots on the Roof
# Plots	70	4	18	6	76	1	76	1	27	6
Plot Size (ft)	8 x 10	4 x 10	2 x 4	5 x 10	6 x 9	4 x 12	5 x 5 and 5 x 10	unknown	6 x 9	45 x 45 and 2 x 10
Total Plot Area (ft^2)	5600	160	144	300	4104	48	3300	4000	1458	2100
Communal or Individual	Individual	Communal	Individual	Communal	Individual	Communal	Individual	Communal	Individual	Communal and Individual

Although we were able to distribute a survey link with the UNA garden manager, Wegland Sit, (responsible for Nobel Park, Hawthorn, and Rhododendron Woods gardens), he was not available for an interview session. However, we were able to synthesize a list of garden

needs for the UNA gardens based on comments and feedback supplied by UNA community gardeners in the survey. Additionally, we were made aware of the Orchard Garden too late to the project to conduct an interview with their garden manager.

Garden Classifications

Table 3. Garden needs compared to garden size

	Big Gardens	Small Gardens
Funding	0%	50%
Volunteer Retention	17%	75%
Supplies	17%	75%
Event space	17%	75%
Gardening Knowledge	83%	25%
Garden Expansion	50%	25%
Administration Support	50%	0%

Table 4. Garden needs compared to garden association

	Student Gardens	Neighbourhood Garden
Funding	33%	0%
Volunteer Retention	67%	0%
Supplies	50%	25%
Event space	50%	25%
Gardening Knowledge	33%	100%
Garden Expansion	17%	75%
Administration Support	0%	75%

"Big Gardens" are classified as gardens that are greater than 1000 ft^2 in total plot area and "Small Gardens" are classified as gardens that are less than 1000 ft^2 in total plot area. Big gardens reported a greater need for gardening knowledge, garden expansion and administration support than Small gardens (Table 3). Small gardens reported a greater need for funding, volunteer retention, supplies, and event space than Big gardens (Table 3).

When comparing garden needs to type of garden association, we grouped them as Student or Neighbourhood (Table 4). Student gardens are in greater need of funding, volunteer retention, supplies, and event space than Neighbourhood gardens. Neighbourhood gardens are found to have greater need for

gardening knowledge, garden expansion and administration support than Student gardens. All Neighbourhood gardens reported a need for gardening knowledge.

Table 5. Garden needs compared to garden management style.

	Institutionally Managed	Self-Managed
Funding	0%	33%
Volunteer Retention	0%	67%
Supplies	0%	67%
Event space	0%	67%
Gardening Knowledge	75%	50%
Garden Expansion	75%	17%
Administration Support	75%	0%

When looking at garden needs compared to management style, institutionally managed gardens are in greater need of gardening knowledge, garden expansion and administration support than self-managed gardens (Table 5). Self-managed gardens show a significantly greater need for funding, volunteer retention, supplies, and event space than institutionally managed gardens. These four needs of the self-managed gardens are needs that the institutionally managed gardens reported zero demand for.

Table 6. Garden priorities compared to garden size.

	Big Gardens	Small Gardens
Gardening	50%	25%
Education	17%	50%
Social	33%	75%

When looking at garden priorities compared to garden size the following trends are noticed (Table 6). Small gardens tend to prioritize education and social events more so than Big gardens. Big gardens are more likely to prioritize gardening than Small gardens.

Table 7. Garden priorities compared to garden association

	Student Gardens	Neighbourhood Gardens
Gardening	17%	75%
Education	50%	0%
Social	67%	25%

Garden priorities differed when compared to garden association (Table 7). Student gardens prioritize education and socialization greater than neighbourhood

gardens. Neighbourhood gardens prioritize gardening more so than student gardens and have no priority for education.

Table 8. Garden priorities compared to garden management style.

	Institutionally Managed	Self-Managed
Gardening	75%	17%
Education	25%	33%
Social	0%	83%

Institutionally managed gardens have a much greater priority for gardening than self-managed gardens (Table 8). The priority for education was similar between the two management styles. Almost all self-managed gardens prioritize socialization whereas none of the institutionally managed gardens considered socialization a priority.

VII. DISCUSSION

Contributing factors to Biodiversity

Previous research by Clarke et al. informed us that community garden biodiversity is often linked to ethnicity and income (637). We also considered motivation and experience, factors not well covered in the literature, to be potential contributing factors to biodiversity.

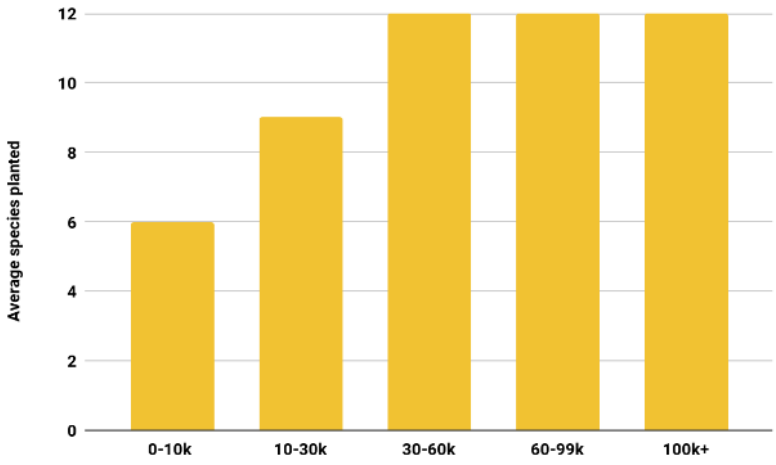

Figure 8. Income brackets vs average species planted in each bracket

We found a significant linkage between income and alpha diversity of all participants. The average number of species planted increases as we move up the income brackets (Figure 8) to a maximum of 12 species, which is much higher than the average of 9.8 species per individual. However, this

biodiversity-income effect may not have the same causative factors as the ones described in literature.

Exploring the Biodiversity-Income effect

Clarke *et al.* use the 'hierarchy of needs' framework to explain how gardeners prioritize different ecosystem services (the benefits provided by a garden) based on their own needs, with subsistence needs (like food and shelter) being the first needs that must be met and higher needs (like self-fulfillment) only being addressed after lower needs (638). In this framework, low-income gardeners have unmet nutritional needs, so they prioritize food production and maximized abundance in their gardens at the expense of a diversity of plants. High-income gardeners meet their nutritional needs outside of the garden, so they are free to pursue other needs within their garden, such as aesthetic needs.

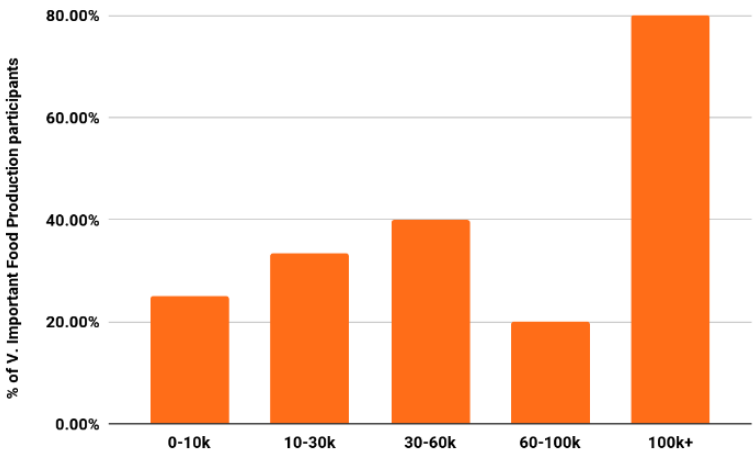

Figure 9. Income brackets vs percentage of participants in that bracket that value Food Production

If the biodiversity-income effect observed in our study matched the 'hierarchy of needs' framework, we would expect to see that low-income gardeners valued food production more often than high income gardeners. Alternatively, we would expect to see that gardeners with the highest biodiversity, as individuals who have presumably met their lower needs, would have different motivations than the gardeners with the lowest biodiversity, who

may be struggling to meet their nutritional needs. However, we do not see either of those phenomena.

When we compared the percentage of participants within each income bracket that said food production was 'Very Important', we found that the very high-income bracket actually had the greatest percentage of participants that valued food production (Figure 9).

High diversity gardeners (those with 10 or more species in their plot) had a similar motivation distribution to low diversity gardeners (Figure 10). The most divergent motivations were 'Rest and Relaxation', which was moderately preferred by high diversity individuals (50%) and only slightly preferred by low diversity individuals (30.77%), and 'Socialization', which was moderately preferred by low diversity individuals (46.15%) and only slightly preferred by high diversity individuals (33.33%). Food production was almost equally valued by both groups, suggesting that biodiversity is relatively independent of food production-related motivations in our study.

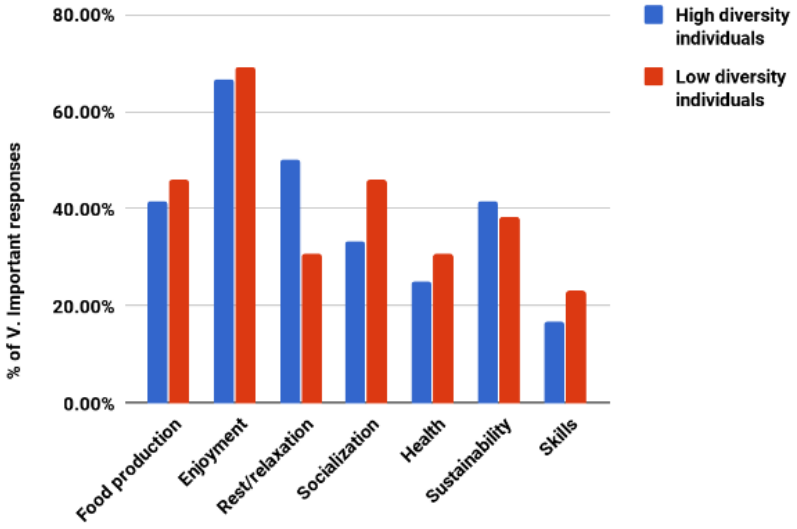

Figure 10. Differences in high vs low diversity individuals in their Very Important motivations

The Student Demographic and Biodiversity

A more plausible explanation for this biodiversity-income effect is that all participants that described themselves as UBC students were present in the lower two income brackets,

creating a distinct group within this bracket. The main difference in this is that UBC students planted, on average, 3.33 less 'species' than other categories and 2.25 fewer species than the survey average (Figure 11)

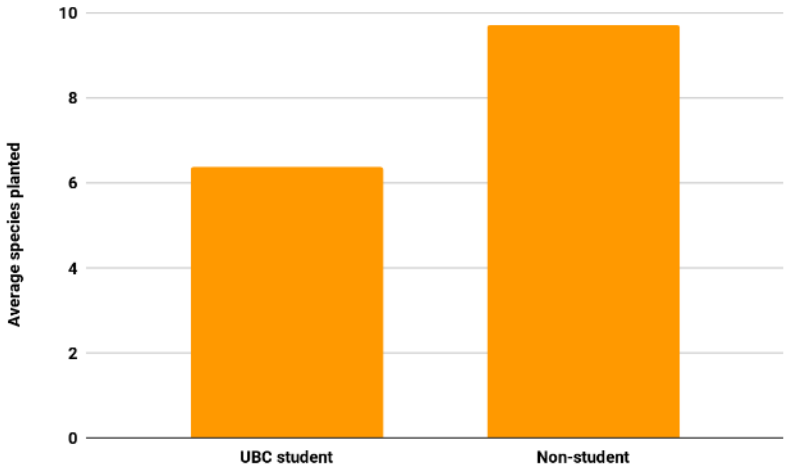

Figure 11. Average biodiversity of UBC students vs non-students

The presence of the student demographic is an important one, as it distinguishes the population in our study from the one examined by Clarke *et al.* Clarke as they studied urban community gardens in Los Angeles, capturing a good number of high and low income households within their sampling area. In this situation, the income of participants is very tightly correlated with their ability to meet their nutritional needs. However, students' income levels are not predictive of their ability to meet nutritional needs because their income is often supplemented by loans or familial allowances to allow them to subsist without full-time employment. Thus, the student demographic distorts the socio-economic assumptions underlying the hierarchy of needs, potentially explaining this difference.

No significant linkages exist within our dataset that explain the decreased biodiversity in the student demographic. Instead, we propose that two potential factors not captured by our survey could be responsible for this effect.

First, we propose that students lack time to garden. Students, especially those who are working part time to make income, have limited time available to garden due to homework and

classes. Additionally, commuter students may live quite far away from campus, further shortening available extracurricular time to garden.

Finally, we propose that seasonal availability decreases biodiversity in student gardens. Most of the academic calendar falls outside of the growing season, meaning that unless students have a reason to be on campus during the summer (such as summer courses or a dedication to gardening), they will not be tending their campus garden plot. This limits student gardens to either spring vegetables with short growing periods, like radishes or salad greens, or fall vegetables that can tolerate the winter, like kale. Naturally, this reduces the range of vegetables that are available to be planted and could explain the reduced biodiversity. As supporting evidence, we can see that the most popular crops on campus are cool-weather crops that can be planted in spring and fall.

Climate Suitability

Our original assumptions were that climate suitability would play a role on 'species' selection on campus. Cold-tolerant plants would likely be more successful than summer plants, so gardeners would be more likely to favour planting these hardier vegetables. Thus, the most abundant plants on campus would also likely be the ones that perform the best in the UBC climate.

Table 9. Percentage of participants who planted each species

Crop	% of participants	Rank
Kale	55.56%	1
Tomatoes	44.44%	2
Garlic	40.74%	3
Swiss chard	40.74%	3
Carrots	37.04%	4
Radishes	33.33%	5
Snap peas	33.33%	5

To an extent, our assumptions were vindicated, as 6 out of 7 vegetables in the top 5 most planted vegetables (by rank) can be considered cool-weather crops suitable for planting in spring or fall (Table 9).

However, tomatoes (a summer crop) were the second most popular vegetable planted. This is not entirely surprising, as tomatoes can do fairly well in Vancouver's hot summers and can be seen as a confirmation of the success of tomato planting at UBC. The abundance of a summer 'species' on the top 5 list also suggests that at least 44% of gardeners are present on campus over the summer and that most 'species' of vegetables are suitable for the Vancouver climate.

The prevalence of cool-season vegetables could thus be a result of seasonal availability of gardeners rather than a seasonal suitability of plants.

Diversity of Knowledge Sources

Gardeners showed a marked preference for physical and social sources of agricultural knowledge. The preferred sources of knowledge were back of seed packet, other gardeners and seed catalog respectively. The reliance on social sources, such as other gardeners, was unsurprising.

Community gardens are places of social interaction and a fundamental goal from the literature on community gardens is their role as a gathering place where knowledge can be shared, and people can learn and interact with their food system (Alberta Health Services 5). In addition to social knowledge transfer being an underlying goal for community gardens, many community gardens are structured to further this information sharing.

Many gardens have 'garden buddies', whereby new gardeners are assigned a partner who is a more experienced gardener to help them in their first year in the garden (Metro Vancouver 15). When interviewing various gardens on campus many identified having a formal or informal 'garden buddy' approach for garden knowledge sharing.

With regards to the physical knowledge sources, those that were more readily accessible were used more frequently (seed packets and seed catalogs over gardening magazines and books). This could be due just to availability and ease as gardeners will gain this information through the purchasing of their seeds and will not have to look further for that information.

Diversity of Seed Sources

The most common source that gardens purchase their seeds and plants are from nurseries, followed by seed suppliers. This is likely due to the wide variety of plant selections available at these locations, which allows gardens to procure the plants they want in a single excursion.

The literature suggests that consumers increasingly prefer to shop with one retailer rather than at multiple stores (Baye et al. 2). The average number of seed sources that gardeners use is 2.88 sources, which suggests that if gardeners have a preferred source of seeds, that single store may not stock the variety they are looking for. However, it is difficult to make this assumption, as we did not collect information on how many seeds and plants came from these sources.

There is a positive relationship between the number of seed sources, income, age and experience, although the effect is quite small. The framework suggested by Clarke *et al*. may also be applied to the context of seed sources. Gardeners with higher income may have more financial opportunities to procure seeds from multiple sources, such as novel and specialized cultivars compared to the more competitive, cheaper varieties (Galluzzi et al. 3647). The literature suggests that seniors in high income households are more likely to participate in

gardening activity and are more likely to use varieties passed down from previous generations (Galluzzi et al. 3645). There is limited research in the relationship of seed sources and gardening experience, however.

Interpreting Garden Classifications

We found through our interviews that big gardens and neighbourhood gardens have a need for gardening knowledge. This could be attributed to high turnover of students and the general transient population on campus. Previous research shows that having people who have participated in the gardens from prior years provides invaluable information about local and regional specific growing tips (Pearson and Firth 150; Spilkova 890). Thus, the need for knowledge in our situation may show that knowledge is not being passed on each year due to past garden members not returning to participate in the garden.

High turnover rates and lack of volunteer retention in small and student run gardens could be influenced by the lack of funding these gardens experience. Garden volunteers may feel discouraged and not participate in the garden if they feel there is no support financially. Lack of paid staff and incentives may discourage volunteer participation and lead to abandonment of the garden (Pearson and Firth 154).

The priority of socialization over food production is similar to results found by Spilkova (892). Gardens tend to prioritize socialization and community engagement in order to make people feel like they fit in with the garden (Spilkova 892). Having socialization as a garden priority also explains why small gardens needed more event space and supplies. Spilkova notes that small gardens tend to have issues with absence of room for social events and storage space (888). More supplies would give small gardens the infrastructure to create barbeque

areas, picnic space and other infrastructure necessary for creating larger community event spaces.

The priority of "gardening" in neighbourhood gardens and institutionally managed gardens suggests that these plots were created solely for production of fresh food. Community gardens provide a source for local, nutritious food for people living in the neighbourhood (Burdine and Taylor 199). Similarly, it is often the case that when institutions or local governments run a community garden, they prioritize food production since it will improve food access in the area (Burdine and Taylor 199). Although grocery stores are easily accessible from UBC, institutionally managed gardens on campus may prioritize food production since it serves as another way to access food.

Furthermore, prioritizing "gardening" in institutionally run gardens, allows the governing body to situate garden operations within the broader context of food policy rather than as a residential amenity, making it easier to access best practices already in use by similar institutions. The institution running the community gardens knows that gardening is the priority, so they can support and manage the garden in a manner that will set the stage for long term success (Pearson and Firth 153).

VIII. RECOMMENDATIONS AND CONCLUSION

Conclusion

This project aimed to gain a baseline understanding of the biodiversity across UBC's Vancouver campus community gardens and an understanding of the sources of knowledge these gardens relied on. Through the use of a survey and in-person interviews with garden managers, this study gained an understanding of the biodiversity grown in 2017, the

administrative and management of each garden, and the knowledge sources utilized by community garden members. This study found that 61 food plants were grown in 2017, with 82 different cultivars being recorded. The numbers and data associated will provide a baseline for future comparisons to the food plant biodiversity on campus. While studying biodiversity, it became clear that the driving motivation behind the community gardens on campus was to have places for social interactions and that gardeners' key motivation was enjoyment of gardening. These findings impact the way community gardens on campus can be framed and how the gardens and gardeners can best be supported. This study also uncovered the lack of connection between gardens on campus and has provided recommendations to improve biodiversity through supporting these gardens. With regards to agricultural knowledge, it was determined that gardeners prefer social and physical resources to gain gardening knowledge. Community gardens at UBC are numerous and support a wide range of biodiversity through the food crops that are grown, but they require further support in order to provide a long term sustainable resource for biodiversity across the campus and gardener education to ensure the understanding of the importance of biodiversity is capitalized on. This study discovered the primary motivation of the community gardens on campus to create a space for socialization and community building. Further work can increase biodiversity and agricultural knowledge through the running of social events that focus on gardening topics that increase gardener knowledge and crop biodiversity in a fun, social setting while building connections between gardeners across campus to support the goal of increase campus wide biodiversity.

Recommendations:

Recommendations for Future Research:

1) Visual assessment during the growing season to enhance understanding of food crop biodiversity

This study was undertaken in Jan-April 2018 and relied on gardener memory of garden production from 2017. A future SEEDs project to visually assess garden plots and speak to gardeners during the growing season could potentially provide more reliable and detailed information that can be used for biodiversity and sustainability analysis of the UBC campus.

2) Research into the record keeping practices of community gardens on campus and supporting the development of biodiversity record keeping.

Researching current record keeping practices could help create an on-going system for collecting biodiversity information for the campus. Strong record keeping will improve community gardens on campus by ensuring information on the garden's history, garden procedures, and site information is not lost with the turnover of gardeners (New Brunswick Food Security Action Network 22). This record keeping could also be an avenue to record biodiversity grown each season and potentially support gardens aiming to increase biodiversity. In terms of gardening skills and success, gardens could record most successful and least successful crops and cultivars of crops to help focus educational gardening support as well as identifying cultivars that are locally support for different conditions.

3) Research student gardener understanding of food plant biodiversity.

This study identified low biodiversity presence in student garden plots. Further research should study if lower than average biodiversity in student plots is due to income, difference in priority, or lack of understanding of the importance of food crop biodiversity. Biodiversity in gardens is important as it creates more resilient ecosystems as well as it maintains a wider range of genetic information (Oliver *et al*. 673). This research will help increase understanding

of factors that affect gardener choice and perception of biodiversity, and how best to encourage students to plant diverse garden plots.

Recommendations for Action and Implementation:

Immediate:

4) Creation of platform to connect all community gardens and gardeners on campus.

This study has created profiles for all the community gardens on campus. These profiles include garden history, contact information and quick facts about each garden. By adding to these profiles, a platform for gardens to contact each other, resources and knowledge could be optimized on campus. This platform would be a way for gardens to share resources such as materials and tools, as well as share information such as events. This platform could be created either by SEEDs or the UBC Botanical Garden. The city of Vancouver has a community garden website that has information on how to start community gardens in the city, guidelines and policies, locations of gardens, resources (planning and grants), how to contact and join gardens and other organizations that support community gardens (City of Vancouver 'community' n.p.). The creation of a similar resource for the UBC community gardens could create a network between the gardens on campus and allow them to interact and improve the knowledge transfer between gardeners and increase the social system of community gardens on campus. The network would create a campus wide information exchange and solves the knowledge transfer problem from high turnover rates in community gardens on campus. This network will improve the wealth of knowledge and skills gardeners on campus have access to, and create a formal way of sharing intergenerational and intercultural knowledge (New Brunswick Food Security Action Network 2).

Medium:

5) UBC Botanical garden run educational workshops that are open for all gardeners to attend.

A primary need identified by most gardens interviewed was the opportunity for event space and educational workshops. Research into community gardens has shown that successful community spaces thrive when utilized for more than one purpose (City of Vancouver 'inclusive' 10). The community gardens on campus identified that they viewed their gardens as a place of community building and social interaction over food production. This factor in combination with gardener preference to gain information through person-to-person and communication with other gardeners and experts highlights the grand potential for educational workshops. The UBC Botanical Garden could support the community gardens on campus by running events for gardeners as they have event space as well as the ability to host all the gardeners, further building upon the garden network goal listed above. The UBC Botanical garden could host events organized by individual gardens or run their own events. When interviewing community gardens, some gardens mentioned that they have variable turn out for the events they plan so it is difficult to continue running events. If events were advertised on the network for all gardeners to see and run at the Botanical Garden, it would improve overall knowledge level of community gardeners and help increase connections and social ties between the gardens.

Long term:

6) Utilizing collected research in biodiversity and running targeted biodiversity events.

Community gardens can be hubs of biodiversity and places of reconnection with the local food system (Society Promoting Environmental Conservation 3). A future research

recommendation was having gardens collect biodiversity information each season and crop and cultivar success rates. The UBC Botanical Garden can support this work by utilizing the collected research to promote new varieties and run workshops on the least successful crops to improve gardener success rates. By promoting new varieties and teaching gardeners how to grow and cook new crops, they can increase the biodiversity on campus by educating gardeners to new crop possibilities. UBC has a diverse community of gardeners from various background and through running workshops and trading crop knowledge people can be introduced to new crops and foods. Overtime these events will increase gardener potential for growing diverse crops, and this knowledge will increase the support of biodiversity over the long term.

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X. APPENDICES

Appendix I. Data set

Please see attached supplementary files for the raw survey data set. Coded interview data is below.

Interview Responses

Code list:

- Management intensity
  - How much does management do? Do they host events, actively attempt to expand, etc?
- Garden priority
  - What is the garden's goal and priority?
- Administration
  - How is the garden run?
- Garden type
  - Shared ownership? Individual?
- Shortcomings/Required resources
  - What are they missing?What do they need?
- Garden established by:
  - UBC? Students? Faculty?
- UBC support (material)
  - Does UBC supply materials (mulch, etc?)
- UBC support (financial)
  - Does UBC provide financial support? Did it do so in the past?
- Costs
  - Do they collect regular fees? How much?

Acadia Park:

-What's the history of your garden?
Established by Housing, Plans and Operations (HPO) in 1993.

-What is the purpose/mandate of the garden?
Purpose of garden is to foster community and relationship building. Many families in Acadia Park are new to Canada and Vancouver and the garden is a way for families to meet others and feel less isolated.

-How is this garden financed?
Annual fees of $35 goes to HPO. Garden managers can then ask HPO for small amounts of money throughout the year for repairs and upkeep of garden.

-What is your garden's organizational structure?

Report to HPO about the garden operation.
There is a volunteer committee (usually 3 people) that changes year by year. Sometimes big decisions are voted on by all garden members.
Try to establish long term group of people who can help run and organize the garden since many garden members are in the UBC area for only ~1 year. Large turn over rate (third of garden members are changed over each year)

-How would you self-classify your garden?
Individual plots. Also communal growing areas. Communal areas were used more for growing herbs.

-Who is allowed to join the garden?
Anyone living in Acadia Park can join the garden. One plot per family.

-Are there any shared rules, regulations, fees?
Fees: annually $35
Rules/Regulations: There is a "Garden Manual" with do's and don'ts

-Community-building?
Send out monthly newsletters to inform people about gardening and sharing knowledge.
This year, will implement "garden buddy". Pair up new gardeners with experienced gardeners so they can learn about gardening and what grows good here.
Host a garden seed swap
Workparties for general garden maintenance. Free pizza offered!!!
Host workshops ~1 month to teach people about preserving foods. Sometimes bring in faculty or knowledgeable people to host a workshop.
On Saturdays and Sundays lots of families go to their garden plots. Informal get together for kids and families to socialize.

-How big is a garden plot?
There are 70 plots. Each plot is 8 ft x 10 ft. About ~1/2 an acre of total garden space.

-What is the garden capacity?
Garden is at capacity (70 plots filled). Last year there was a waitlist of 8 people. At the end of the Winter Semester there is a large changeover in people who are participating.

-Any shared infrastructure? (tools, shed, seeds)
Gazebo, tool shed. Sometimes tools are donated by community, given by UBC or bought and left by a family who moved out.
UBC gives woodchips for building walkways through the garden.

-Does the garden gather information on what is being grown? (i.e. what grows well/not well?)
Generally no, but last year that information was collected to make a word diagram for their Facebook page.
Know that there are lots of brassicas growing and that those seeds are not good to save due to crossing of species.

-What are your garden's priorities moving forward? Future goals?

Would like more open areas for community building activities and social events. Would like to remove plots in shady areas to create seating areas.
Implement crop rotation to have healthier soil.
Repair wooden plot boxes.
Need more control over allocation of resources (i.e. specific dates for shipment of woodchips from UBC)

-What do you need to meet these priorities?
Would like to get seeds and perennial plants from Botanical Gardens for planting in shared communal areas.
Need more engagement from outside sources for information and resources on what types of plants to grow as perennials.

-Anything else you want to add about your garden?
Hard to plan ahead for garden operation and crop rotation since there is a large changeover in people each year.

-What's the best way to reach a garden administrator?
Best to contact a Resident Life Manager by email: acadiaparkgarden@gmail.com
Also can contact through Acadia Park Facebook Group Page.

Agronomy:

History of the Garden
The garden was established in July 2017. It started out as an idea by Julian Villafuerte-Diaz to create a garden along Main Mall as a demonstration project for social change. This was to expose the food system to the campus community and allow people to realize that they can be a participant in the food system, as well as acting as a gateway to other food system at UBC.

The present location was chosen due to its proximity to water access and LFS, to ensure a long term existence.

Purpose of the Garden
In essence, it acted as a "showchase" a model for environmental and social stewardship in the food system.

How is the garden financed?
The garden was established by using funds from the AMS Sustainability Fund ($3,900). In the long term, it has yet to be determined where the funding will come from, however the Faculty of LFS has agreed to be responsible for the garden and pay for its removable should it become abandoned. It is likely that our funding will come LFS.

Organizational Structure

It is a group of 4 core members in the steering committee composed of students chosen from recurring people at our gatherings. We also have faculty members that oversee our decisions. Since its a new garden, the organizational structure is not yet set in stone.

How would you self-classify your garden?
Communal

Who is allowed to join the garden?
Anyone can join, just show up to one of our harvest day or contact us on FB.

Are there any shared rules, regulations, fees?
No fees or rules.

Community Building
We would like to host workshops and provide a place of education (e.g. signage), however we haven't developed these ideas yet.

-How big is a garden plot?
There are 4 boxes, 8 x 4 ft each.

-What is the garden capacity?
It is "at capacity" as the garden is small and does not need many people to maintain it (3 people to maintain the garden). However we would like more involvement as it is better for the garden's resilience and provide a reason for expansion.

-Any shared infrastructure? (tools, shed, seeds)
We share infrastructure and tools with the Orchard Garden. We also often collaborate with Roots on the Roof and GeoGarden.

-Does the garden gather information on what is being grown?

-What are your garden's priorities moving forward? Future goals?
Our priority is to give students an opportunity to build community, networks and a place to create. Some barriers we have are funding, and the time for students to engage with the garden. We need to establish a system for continuity and support for resources.

-What do you need to meet these priorities?

-Anything else you want to add about your garden?

-What's the best way to reach a garden administrator?

The best way to contact us is through our email: agronomygarden@gmail.com

ANSO Interview

What's the history of your garden?
Initially, ANSO had a horrible 'area', overgrown with grass but not nice. People were dumping litter or parking there, which was not great because it is on top of a rooftop.
Applied for a sustainability grant to establish a garden. Lots of paperwork involved for legality.
Also applied for a HR healthy workplace grant (for more money and to include the whole building instead of a small scale garden). Successfully got.
Campus & Community Planning was some back and forth with the dean Gregory.
Got some input from Dean Gregory about aesthetics.
However, did not have to do a presentation because was on rooftop (not actual 'land' use)
When was the garden established?
Garden started in 2014
Who established it?
Presumably Kristin.
What lead to the establishment?
Space not being utilized properly.
What is the purpose/mandate of the garden?
No specific purpose.
Unofficial language: Healthy community, healthy employees.
How is this garden financed?

- Garden is financed via:
    - Donations from Plant Ops (compost) & Facilities Manager
        - When landscaping people apply compost in the surrounding area, Kristin asks for any extra that they have.
    - Small-scale, so they don't need much, just half a yard.
    - Won a small prize for participation in sustainability contest (Lights Out) and got $200.
    - Gardeners all chip in for seeds.
        - Shared seed box.
        - Not all gardeners share seeds, some people use their own ("sneak them in without sharing").
- **Who decides how money is spent?**
    - *Presumably Kristin*

What is your garden's organizational structure?
Kristin is the manager and there is a "committee".
There are 2 people to be on the committee as needed, but they often forget. No need, really.
If necessary, Kristin consults her manager for help.

How would you self-classify your garden? (communal, individual plots in shared space)
Mostly individual plots, a couple of communal plots that are grown with herbs
Are there any shared rules, regulations, fees?
Plotholder agreement (Check the website).
No fees.

Who is allowed to join the garden?
Anybody in the building and also MOA and students.
Initially, one designated for undergrads, but now only grad students want one (25%).
Community-building?
Do you run any garden events?
Do you conduct any social or educational workshops?
They try (garden parties) but low turnout.
Some 'work parties' but not actual social events.
ANSO garden advertised as a good social event hosting place. So student association will host events there (rather than self-hosted).
ANSO building hosts functions there.
Kind of a community gathering place
How big is a garden plot?
(2 x 5, 2 x 4?) *We went out to take a look, and it looked closer to 2' x 4'*
Shared or individual?
Individual plots, but some people choose to share within their own agreements. One communal plot (unofficial)
What is the garden capacity?
18 plots.
What is the capacity of the garden? Are you at capacity? Waitlist?
At capacity right now.
Garden registration is not fully publicized (was at first registration) and is mostly advertised by word of mouth. If people are interested, they can usually figure out how to reach Kristin. "it's a pretty good system and there is one person who is asking for an open plot if possible"
Waitlist has reached 3 months max, only 1 or 2.
People only really want plots during the summer.
Some people want/have multiple spaces.
How many people last year (roughly)
24 people total**.**
How big is the garden total (number of plots or acreage)?
Any shared infrastructure? (tools, shed, seeds)
Seeds are shared (the box)
Garden box with shared tools. Not locked because it was frustrating to remember the number.
One expensive tool is stored in Kristin's office.
***Does the garden gather information on what is being grown? i.e. what grows well/not well?**
Did not collect this response, but we assume there was no log.
What are your garden's priorities moving forward?
(What is the garden's future goals?)
Expansion is an ANSO goal.
Weather-resistant lawn furniture and more plots.
What do you need to meet these priorities?
More financing is needed for plots and furniture.
People with the time and initiative to seek funding and sourcing for supplies.
Kristin says that there are lots of guerilla gardens so the ANSO was a 'fun project'. Would be nice to have someone else take over as garden manager. She does 'minimal amount'.
(What do you need?)
Wrap-Up: Anything else you'd want to add?
Not really.

Summer is a busy period, where watering is needed every day. Mike the plumber hooks up a hose during the spring for ANSO garden and the major guerilla garden in front (tomatoes).
ANSO is doing well because of support from plumber and plant ops donation.
People don't like buying their own dirt, so this is very useful.
Gardeners communicate via a list-serv (so they can all communicate together). This is a very important community building function.
Over the winter, 3 people tried to lay down cloth and build frames, but they didn't have much help. They would like to be able to do some seasonal extension and garden during winter.
Expansion help (financing)
Also education.
What's the best way to reach a garden administrator?
Not really another contact besides Kristin.
soci.head@ubc.ca
Would you like a copy of our final report?
Yes.

Michael Smith Lab Garden Interview

What's the history of your garden?

When was the garden established?

Established in 2017.

Who established it?

Established last year by Guillaume and Gregory post-docs at Michael Smith Lab.

What lead to the establishment?

During construction on East mall they redid the area and ended up leaving a bunch of soil behind. A random tomato plant grew up out of the soil and they began taking care of it. This gave them the idea to turn the space into a garden.Spoke to the MSL Building Space Manager who supported the project. Applied and received a $2500 grant from LC Workplace Initiative. This funding comes from UBC and has funded other projects such as community gardens, yoga and runs. They have used part of the grant so far for equipment and seeds and are hoping to use remaining to expand the garden in the coming years.

They got in touch with UBC landscape through Dean Gregory to get permission to begin the garden. The agreement was they were allowed to go ahead but if in the future UBC wants to build on the land they will have to give it back.

What is the purpose/mandate of the garden?

Mainly just for fun as the garden is too small to focus on food production. The main purpose is social, as the garden allows people to get to know people in the lab and also creates a nice space to sit and chat when having lunch or a coffee break.
Also to increase awareness of gardening movement and how gardening is done. MSL Garden is in a great, central location with lots of foot traffic to show people about gardens. This is for both public and researchers at MSL as some of the researchers work of plant genomes but do not know how to grow the plants they study.

How is this garden financed?

Applied and received a $2500 grant from LC Workplace Initiative. This funding comes from UBC and has funded other projects such as community gardens, yoga and runs. They have used part of the grant so far for equipment and seeds and are hoping to use remaining to expand the garden in the coming years.

They have an idea to sell some of the produce each year to make enough money to buy next years seeds, in order to keep the project sustainable over the long term.

- Who decides how money is spent?

Group decision at meetings.

What is your garden's organizational structure?

Not much organizational structure. Last year it was Guillaume, Gregory and Esperanza who ran the garden. They organized a few meetings for anyone interested from MSL to attend where they came up with ideas and plans for the garden. They also had a watering schedule where they assigned two people every two days to water the garden.

Two of the garden leads are post-docs so potential worry about ensuring continuity of the project. Some of the active members have permanent positions so hoping to keep them involved and increase participation of other permanent staff.

Who makes decisions about the garden as a whole?

Guillaume, Gregory and Esperanza main decision makers, but try to make decisions as a group of MSL.

Do you have a garden administrator or an administrative group?

Same as above.

How would you self-classify your garden? (communal, individual plots in shared space)

Communal.There are about 200 people in MSL and they are all free to take anything they would like from the garden on the way home. When they do a harvest they place food in the lunch room for people to take home.

Are there any shared rules, regulations, fees?

Free!

Who is allowed to join the garden?

Anyone in MSL. Also interested in getting more people involved. We reached out to FNH building to get them involved in the garden.

Community-building?

Do you run any garden events? Do you conduct any social or educational workshops?

No lab events yet. Had hoped to have a harvest BBQ last year but not enough food was produced. They are considering using some of the grant money to send some of the MSL people to a UBC Farm education workshop on gardening.

How big is a garden plot?

4x12ft

Shared or individual?

Communal garden.

What is the garden capacity?

What is the capacity of the garden? Are you at capacity? Waitlist?

Can always have more people at this communal garden, but since it is so small currently they do not actually need many people to do the work. Last years six active people was enough to run the garden.

How many people last year (roughly)

There are currently ten people involved with the garden with six main active members.
There are about 200 people in MSL and they are all free to take anything they would like from the garden on the way home. When they do a harvest they place food in the lunch room for people to take home.

How big is the garden total (number of plots or acreage)?

One communal plot 4x12ft

Any shared infrastructure? (tools, shed, seeds)

Used grant to buy equipment and seeds. Have access to tap on outside of MSL for water.

What are your garden's priorities moving forward?

(What is the garden's future goals?)

To improve how the garden looks by adding nicer signs and potentially building raised beds.
Main goal to increase size, stretch it to cover the whole area in front of the building to the road.
Continue to have fun and meet new people (social)!

What do you need to meet these priorities?

(What do you need?)

Wrap-Up: Anything else you'd want to add?

Last year had a problem with random people taking food. They don't mind people in the building helping themselves but had a problem with random passersbys taking food.
People really enjoyed seeing the garden and eating lunch by the garden.
Have a goal of donating produce to the UBC Food Bank.

Last year they had one major harvest. They put the harvest in the lunch room and sent an email to the building letting people know to help themselves. It was gone in five minutes.

In contact with Tathali Urenta Ortz (Learning Network – Faculty of Education. She is working on putting the different campus community gardens in contact with each other.

What's the best way to reach a garden administrator?

They send out newsletters every few months. The garden has a communication team in MSL. There is no set email for the garden just internal emails sent to all MSL staff. Can use Guillaume (gdejean@msl.ubc.ca) as contact person for outside inquires.

Would you like a copy of our final report?

Yes please send it to us.

Roots on the Roof Interview

What's the history of your garden?
When was the garden established?
2014 (club establishment), 2015 garden establishment
Who established it?
Core exec team, all from the same high school (students).
What lead to the establishment?
Open space on new AMS building, in need of a garden (AMS wanted one)
What is the purpose/mandate of the garden?
Roots on the Roof is "a communal space that celebrates sustainable and just food systems through healthy relationships with food, each other, and the land we live."
Wanted a community space to make connections. Everybody likes gardening, but the space is designed to facilitate making connections
How is this garden financed?
Garden is largely self-sustaining through CSA and market stand sales. However, it does collect membership fees to supplement that.
Initial construction was heavily reliant on grants from both UBC
UBC/AMS continue to help fund the garden
No rent charged for garden
Who decides how money is spent?
Steering committee/executive.
What is your garden's organizational structure?
Combination of AMS executive (President, Secretary, Treasurer, VP) and an core committee of club members with roles like internal/external education coordinator.
Community plot coordinator
Social media coordinator
These are all subcommitees
Garden manager (paid?)
Summer gardening interns (paid through UBC grant money)
Who makes decisions about the garden as a whole?
Executive
Do you have a garden administrator or an administrative group?
How would you self-classify your garden? (communal, individual plots in shared space)
Volunteer-run farm
Are there any shared rules, regulations, fees?
$5 fee, only organic growing.
Who is allowed to join the garden?
Only club members. Also, 5 'individual' plots are only for club members (extra 5 members)
Community-building?
Lots of events and also sales/donations to campus food organizations (which gets them involved with the club).
Do you run any garden events?
Lots.
Do you conduct any social or educational workshops?
Lots.
How big is a garden plot?

Shared or individual?
2000 sq ft communal plot.
Smaller (large) 5 individual plots (bigger than standard 2x4, maybe 2 x 10)
What is the garden capacity?
Communal
What is the capacity of the garden? Are you at capacity? Waitlist?
5 individual plots (limited interest) and unlimited membership.
Low demand attributed to easy availability of gardening in main plot, limited interest in maintaining an individual plot.
How many people last year (roughly)
At least 100 members.
How big is the garden total (number of plots or acreage)?
Any shared infrastructure? (tools, shed, seeds)
Everything is shared, seed bank.
***Does the garden gather information on what is being grown? i.e. what grows well/not well?**
Garden is pre-planned and logged by garden manager.
What are your garden's priorities moving forward?
Maintain a vibrant and healthy community.
(What is the garden's future goals?)
What do you need to meet these priorities?
Knowledge transfer issues.
Difficult to make sure that new club members learn everything they need to know.
Partially ameliorated by paid internship program (interns often become garden managers)
Passive engagement
Difficult to ensure that members continue to help out.
Difficult to allow members to participate (garden is closed unless staff members are present)
(What do you need?)
Wrap-Up: Anything else you'd want to add?
What's the best way to reach a garden administrator?
Would you like a copy of our final report?

GeoGarden:

-What's the history of your garden?
A group of geography students submitted a garden proposal in 2012 to the Geography Students Association VP and to the Development Review Committee of UBC. It was was approved and the garden was built in 2013.

-What is the purpose/mandate of the garden?
Purpose was to use as a teaching resource and to promote community involvement. This was the purpose when the garden was created but currently the garden is not following this purpose.

-How is this garden financed?
The person who has the role of the Geogarden Manager, as well as the Sustainability VP of the GSA decide how are money is spent. We have a budget from the GSA's savings account.

The garden does not often need a lot of financial attention as we receive seeds for free or a minimal cost.

-What is your garden's organizational structure?
Two distinct organizational structures for the two garden areas.
The GeoGarden Manager and the sustainability VP make decisions about the garden, but also ask the greater GSA (Geography Students Association) for input.Oversees 3 plots that are used by undergraduate students.
For the 3 plots belonging to grad students/faculty/staff, there are frequent garden meetings open to anyone who is interested to show up. Decisions about what will be grown each year are discussed in these meetings.

-How would you self-classify your garden?
Communal

-Who is allowed to join the garden?
Any geography undergraduates, graduate students, faculty and staff.

-Are there any shared rules, regulations, fees?
As the garden is small scale, no major rules have been made. The Sustainability VP and the Geogarden Manager successfully communicate. The only 'rule' is that you get to take harvest produce home if you help out!
True community garden style, no fee.
Any student can join the garden! The GeoGarden has a volunteer page where planting/weeding/harvest days are posted.

-Community-building?
No events held, but would like to have them.
I have not this year, but I know they have happened in the past! Will maybe hold an event in the summer for harvesting time.
I also have not done any workshops this year, but I know they were done in the past. Our sustainability VP did a Mason Bee Workshop this year but unfortunately we could not work out to do it with/beside the garden.

-How big is a garden plot?
6 plots that are 5 ft x 10 ft

-What is the garden capacity?
Because I don't actually have many volunteers, I don't have a capacity and there is not a wait list! Just a facebook group!
Last year estimate about 6 people consistently.

-Any shared infrastructure? (tools, shed, seeds)
Shared tools, watering hose. UBC donates soil each year.
One locker in the Geography building with tools and seeds with a combination lock for easy access for volunteers I trust!

-Does the garden gather information on what is being grown? (i.e. what grows well/not well?)
Grad/faculty/staff garden collectively decide what to grow each year, but do not keep track.
Undergrad garden not sure. High turnover rate so it is hard to know what is going on each year.

-What are your garden's priorities moving forward? Future goals?
Future Goals: to get more students involved and aware of the garden (especially geography students who walk by it every day) and a way to do this: want to make creating a better sign for the garden a priority

-What do you need to meet these priorities?
People who are eager to participate in the garden and who will encourage others to get involved.

-Anything else you want to add about your garden?
Even though the gardens are communal, a few people are involved in the plots and take the food that is grown. Communal plots but food is not shared.
In the summertime, the undergrad garden is over grown and not cared for since many students are not around.

-What's the best way to reach a garden administrator?
For undergraduate garden: GeoGarden Volunteer Facebook Page or info@ubcgsa.ca
Graduate/Faculty/Staff garden: info@ubcgsa.ca

UNA Gardens

Collected survey comments:
Rhodo:

- Gardens are lacking in ways to build community
- No intra-garden contact (like list serv)
- No way to organize events, share information
- UNA liason unresponsive
- Infrastructure is broken (toolbox & hose accessories)
- No way to use garden fees to replace

Hawthorn

- More workshops
- Would love lectures from experts
- More plots, especially ones in sunlight

Nobel Park

- Would like a rotation system to open up access to large plots via small plots

No UNA interview, but from survey comments, we can determine that:

- UNA gardens offer few, if any, workshops or events due to multiple requests for them in the survey.

- There is high demand for more plots.
- The purpose of the UNA garden seems to be more to provide gardening space (like an allotment garden) than to build community (like a community garden).
    - Gardeners have no way to contact each other or to organize, as the UNA controls the email list and application process.
    - Gardeners have no control over finances.
    - The 'garden manager' may be too busy to attend to community garden needs, such as damaged infrastructure.
- Garden participants that were surveyed would prefer a more 'community garden' style system rather than the current allotment system.

Based on this, we can identify needs:

1. Adminstrative needs, in terms of organizing so that gardeners feel that have more voice and autonomy, as well as shifting responsibilities away from the current garden manager
2. Educational needs for workshops
3. Expansion needs. Unsure of whether this is a financial or logistical roadblock.

Appendix II. Survey Questions

SEEDS Community Garden Survey

Start of Block: Demographics Base/Universal

Q25 Hello! Thanks for taking the time to participate in our survey. It should take you about **5-10 minutes,** based on how many different crops you planted last year. As thanks, if you provide your name and email, **you will be entered in a draw to win $50 from the UBC Bookstore.**

Here's a quick question: How much do you know about community agriculture at UBC? If you're like us, the answer is: *a bit, but we'd really like to know more*. The UBC Botanical Garden had the same answer as us, which is important because they want to know **how they can help community gardens at UBC**. The result is this survey, which is part of the **Food Garden Biodiversity Project**, formed through a partnership with SEEDS Sustainability Program.

Our aim from this research is to get to know you, the community gardener, and to get to know your gardens. **We're going to ask you questions about:** Who you are as a gardener. (No names, of course) Where you get your seeds and gardening know-how What you planted in your garden last

year in 2017. (We get it, it's a little early to be planting right now)
All information provided will be kept anonymous. This survey system complies with the BC Freedom of Information and Protection of Privacy Act and stores all data in Canadian servers.

If you have any issues with the survey, feel free to contact our Survey Administrator at ning.yan@alumni.ubc.ca

Page Break

Q26 **Section 1: Getting To Know You**

We're going to ask you a few questions about yourself! If some of the questions get awkward, feel free to use "Prefer not to answer".

Q1 How old are you? Or how young are you, if you'd prefer that instead. (You can leave this blank if you want)

- ○ Under 18 (1)
- ○ 19-24 (2)
- ○ 25-34 (3)
- ○ 35 - 49 (4)
- ○ 50 - 64 (5)
- ○ 65+ (7)
- ○ Prefer not to say (6)

Q10 Whereabouts do you live?

- ○ On-campus: Student residence (1)
- ○ On-campus: Neighbourhood (2)
- ○ Off-campus (3)
- ○ Prefer not to answer (4)

Q11 What categories do you think you fit best in? Select all that apply.

- ☐ UBC student (1)
- ☐ UBC faculty (2)
- ☐ UBC staff (3)
- ☐ Community resident (4)
- ☐ Gardener from outside the local community (5)
- ☐ Other (6) _____
- ☐ Prefer not to answer (7)

Q5 Choose an ethnicity that you associate with:

- ☐ White or Caucasian (1)
- ☐ Black or African American (2)
- ☐ First Nations (3)
- ☐ East Asian and Southeast Asian (4)
- ☐ South Asian (5)
- ☐ Hawaiian or Pacific Islander (6)
- ☐ Other (7) _____
- ☐ North African (8)
- ☐ South African (9)
- ☐ Middle Eastern and West Central Asian (10)
- ☐ Latin, Central, and South American (11)
- ☐ Southern European (12)
- ☐ Northern European (13)
- ☐ Prefer not to answer (14)

Q6 Gender you identify with:

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary (3)
- ○ Prefer not to answer (4)

Q7 Please estimate your annual income.

- ○ Less than $10,000 (1)
- ○ $10,000 to $29,999 (2)
- ○ $30,000 to $59,999 (3)
- ○ $60,000 to $99,999 (4)
- ○ $100,000+ (5)
- ○ Prefer not to answer (6)

Page Break

End of Block: Demographics Base/Universal

Start of Block: Garden Info

Q27 **Section 2: Let's Talk About Garden Stuff**

This next section is all about gardening and gardens, but not about what's in your garden. Don't worry, we'll get to that part.

Q16 How long have you been gardening? (In general, not just at your current community garden)

- I'm brand new! - Less than a year (1)
- 1-2 years (2)
- 3 - 6 years (3)
- 7 - 10 years (4)
- 11+ years (5)

Q17 How long have you been participating at your current **community garden?**

- I'm brand new! - Less than a year (1)
- 1 -2 years (2)
- 3+ years (3)

Q12 Which community garden are you a part of? And if you're from the UBC Farm, just pretend it's a really big garden.

▼Roots on the Roof (1) ... Other (9)

Display This Question:

If Which community garden are you a part of? And if you're from the UBC Farm, just pretend it's a re... = Other

Q16 Whoops! Sorry for leaving you off the list. Could you tell us which garden you're a part of?

_____

Q23 People tend to participate in community gardening for a lot of reasons. What are yours? List the importance of each reason to you.

	Very important (1)	Important (2)	Somewhat important (3)	Not Important (4)
Food production. I want to grow and eat my plants! (1)	○	○	○	○
Enjoyment. I just like gardening . (2)	○	○	○	○
Rest and relaxation. Gardening relaxes me. (3)	○	○	○	○
Socialization. Gardening is more fun together and I like to meet people (4)	○	○	○	○
Health. Gardening is great for staying healthy. (6)	○	○	○	○
Sustainability. I want to improve sustainability in my local community (7)	○	○	○	○
Skills & Education. I want to develop a skill (9)	○	○	○	○
Other. I have my own reasons which might be a little bit complicated. (5)	○	○	○	○

Q13 Where do you get your seeds and/or seedlings? Check all that apply.

- ☐ Direct from a seed supplier (like Westcoast Seeds, Salt Spring Seeds, or Burpee) (1)
- ☐ UBC Botanical Garden (2)
- ☐ Grocery or Retail stores (3)
- ☐ Nurseries (4)
- ☐ Seed saving (5)
- ☐ From friends or other gardeners (6)
- ☐ Garden centres (7)
- ☐ A seed bank or seed library (e.g Vancouver Seed Bank or the Botany Enthusiasts Club) (10)
- ☐ Other (8) _____

Q14 Where do you get your gardening information?

- [ ] The back of the seed packet (1)
- [ ] A seed catalog (10)
- [ ] From other community gardeners (2)
- [ ] Gardening blogs and websites (3)
- [ ] Asking professionals, experts, and mentors (4)
- [ ] Online communities and forums (5)
- [ ] UBC Botanical Garden's GrowGreen Guide (6)
- [ ] Social media (7)
- [ ] Gardening books and magazines (8)
- [ ] Other (9) _____

End of Block: Garden Info

Start of Block: Vegetables I: Root Vegetables & Leafy Greens

Q29 **Section 3: Talking Our Way Into Your Plants**

Finally, the fun part, right? We've done our best to group up all of the plants you might have grown into categories. Just **click** on the names of your vegetables in each category and then **click** on the **Planted** button to **highlight your answers**.

A question will open up later that will let you elaborate on the varieties you planted last year. We'll give you a few **example varieties** to jog your memory, but if you can't remember, **feel free to leave it blank**.

Q30 Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on the word then select '**Planted**'. If you've done it right, the word should turn green. If you don't remember your plant variety name, **feel free to leave it blank.**

	Planted (1)
1: Carrots, (242)	
2: Potatoes, (243)	
3: Onions, (244)	
4: Shallots, (245)	
5: Beets, (246)	
6: Radishes, (247)	
7: Garlic, (248)	
8: Turnip, (249)	
9: Rutabaga, (250)	
10: Parsnip, (251)	
11: Daikon/White Radish (258)	

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 1: Carrots, [Planted]

Q32 **Carrots!** Never say that we don't *care-at* all, because we want to know the variety of carrot you planted. Here's a couple of examples: (Danvers, Sugarsnax, Scarlet Nantes, Royal Chantenay, Purple Haze)

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 2: Potatoes, [Planted]

Q33 **Potatoes!** Hey, why did the potatoes argue? 'Cause they couldn't see *eye to eye*! Like, potato eyes and... Well, if you remember the potato variety you planted, please write it down here. Need some help to jog your memory? We found: (Carolina, Noblesse, Yukon Gold, Russian Blue, Satina)

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 3: Onions, [Planted]

Q34 **Onions!** Gosh, this survey is just going *onion* on and on. Save us from bad puns by writing down your onion varieties! Need some inspiration? We found: (Sweet onions (walla walla, Ailsa Craig) and Storage onions (copra calibra, cabernet, red wing, white wing)

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 4: Shallots, [Planted]

Q35 **Shallots!** This is *shallot* of questions, huh? But think of all the great puns you're discovering! Also, please write down the shallot varieties you planted, maybe varieties like: (Ambition or Conserver)

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 5: Beets, [Planted]

Q36 **Beets!** Let's not *beet* around the bush; we want to know about the beets you planted last year. Were they: (Red Ace, Early Wonder Tall Top, Chioggia, Touchstone) or some other kind?

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 6: Radishes, [Planted]

Q37 **Radishes!** What's small, red, and whispers? A *hoarse radish*. But seriously, if you grew horseradish, you can put that here too. Or maybe you grew: (French Breakfast, Rudolf, White Beauty, Amethyst, White Icicle)?

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 7: Garlic, [Planted]

Q38 **Garlic!** My dog keeps eating my garlic, so now his bark is worse than his bite. Jokes aside, don't actually do that. Garlic is **poisonous** to dogs. Look how much you're learning! You can pay us back by writing down the type of garlic you grew, like maybe (Chesnok Red, Italian Hardneck, Russian Red, Music, Yugoslavian).

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 8: Turnip, [Planted]

Q39 **Turnips!** Looking for the end of this section? Don't worry, it'll *turnip* eventually! Just like this informative list of turnip varieties: (Purple Prince, Jaune Boule d'Or, Golden Globe, Purple Top, White Globe).

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 9: Rutabaga, [Planted]

Q40 **Rutabagas!** They taste kinda *swede*-ish to me. Get it? Because rutabagas are also known as swedes! Ha, I'm funny. Anyways, we found two varieties of rutabaga, (Laurentian & Helenor) can you add to the list?

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 10: Parsnip, [Planted]

Q41 **Parsnips!** Really? Wow, I didn't think anybody grew these. No pun for you, you deserve an award or something. Anyways, we found two varieties of parsnips, (Gladiator & Lancer) can you add to the list?

_____

Display This Question:

If Root Vegetables: The underground music sensation. We're rooting for you. Remember, click once on... = 11: Daikon/White Radish [Planted]

Q42 **Daikon!** Thank goodness it's also known as the white radish, because I couldn't think of any daikon puns. Did you know that you look *radishing* today? Just like this list of daikon varieties: (Mini Purple Daikon, Minowase Summer Cross, Wasabi Radish). Please write in your daikons below.

_____

Page Break

Q44 Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then select '**Planted**'. If you've done it right, the word should turn green.

	Planted (1)
1: Spinach, (64)	
2: Kale, (65)	
3: Collards, (77)	
4: Cabbage, (83)	
5: Swiss chard, (79)	
6: Arugula, (68)	
7: Watercress, (69)	
8: Lettuce, (71)	
9: Choi sum, (80)	
10: Bok Choy, (81)	
11: Mustard Greens (82)	

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 1: Spinach, [Planted]

Q45 **Spinach!** Care to *spinach* the wheel and write in a variety that you planted last year? We know a bunch of ones called: (Monstrueux de Viroflay, New Zealand, Samish,Avon, Bloomsdale).

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 2: Kale, [Planted]

Q46 **Kale!** Don't *kale* it quits now, you're doing so well! We're pretty sure that everybody plants kale, so you've probably heard of these ones: (Red Russian, Tronchuda, Redbor, Lacinato, Rainbow)

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 3: Collards, [Planted]

Q47 **Collard greens!** You might be the military type if you answer the *collard* duty. We've really only found Collard seeds on sale with Westcoast and they sell (Champion) seeds. Did you plant them?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 5: Swiss chard, [Planted]

Q48 **Swiss chard!** What do you call leafy greens that guard the Pope? The *Swiss chard*! I'm really proud of that one. Chard has a lot to be proud about, because it comes in so many different kinds.
There's (Flamingo Pink, Canary Yellow, Celebration, Magenta Sunset, Peppermint) and many more.
What did you plant?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 6: Arugula, [Planted]

Q49 **Arugula!** We're just arugula bunch of gardeners, how did we come up with so many puns? (The internet) What kind of arugula did you plant? We like: (Astro, Dragons Tongue, Wild, Wasabi)

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 7: Watercress, [Planted]

Q50 **Watercress!** Our sense of humour is awful, but that's just our *cress* to bear. We've heard of (True & Curly Cress) but did you plant a different variety?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 8: Lettuce, [Planted]

Q51 **Lettuce!** We already wrote a lettuce pun in, but *lettuce* have another one. That was it; that was the pun. There are *so* many kinds of lettuce we hesitate to give you any examples, but here's some anyways: (Blushed Butter, Tom Thumb, Fossey). Please, share with us the varieties of lettuce you grew.

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 9: Choi sum, [Planted]

Q52 **Choi sum!** I'm really struggling to find a pun for this one. Ah well, you win some, you *choi sum.* Local seed retailers sell (Jade Spring & Toy Choy) but do you have different kinds of choi sum?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 10: Bok Choy, [Planted]

Q53 **Bok choy!** *Choy* to the world, the sun's coming *bok.* I'll admit that wasn't my best, but these cross-lingual puns are tough. Anyways, intrepid gardener, we found a couple of bok choi varieties called: (Ching Chiang, Taiwan, Tah Tsai, Mei Qing) Did you plant these or different ones?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 11: Mustard Greens [Planted]

Q54 **Mustard Greens!** I *mustard*-mit, I wrote all of these in one day and I'm starting to get tired of puns. But don't let me get you down, let's talk mustard. We picked out (Bau Sin, Mizuna, Komatsuna Green) as an example of a couple of greens. What did you plant?

_____

Display This Question:

If Leafy Greens: Don't leaf us alone, lettuce go together! Remember, click once on the word then sel... = 4: Cabbage, [Planted]

Q56 **Cabbage!** I have a really short temper because of all of my emotional *cabbage.* Just kidding, I'm actually a terrific person to be around. Speaking of which, what kind of cabbage did you plant? We thought you might have planted (Charmant, Danish Ballhead, Taiwan)

_____

Page Break

End of Block: Vegetables I: Root Vegetables & Leafy Greens

Start of Block: Vegetables II: Everything Else

Q55 Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomatoes know, they'll turn even more red. Remember, click once on the word then select 'Planted'. If you've done it right, the word should turn green. If you don't remember your variety name, **feel free to leave it blank.**

	Planted (1)
1: Shelling peas, (64)	
2: snap peas, (65)	
3: snow peas, (66)	
4: bush beans, (67)	
5: pole beans, (68)	
6: broad beans, (69)	
7: soybeans (75)	

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 1: Shelling peas, [Planted]

Q57 **Shelling peas!** These little friends take a lot of work to eat since you need to shuck them, *peas* by *peas.* They have names like (Alderman Tall Telephone, Little Marvel, Purple Mist). Do you remember what yours was called?

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 2: snap peas, [Planted]

Q58 **Snap peas!** These sugary friends are round, rather than flat like snow peas. Can you *snap* a *peas* off for me? That pun worked better in my head... Anyways, local seed shops sell varieties like (Cascadia & Sugar Daddy). What did you plant?

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 3: snow peas, [Planted]

Q59 **Snow peas!** These tasty friends are apparently called snow peas because they can be planted early in the season. Rather ap*peal*ing in our chilly Vancouver spring. Don't mix them up with snap peas, (Dwarf Grey Sugar & Mammoth Melting Sugar) are actually snow pea varieties, Which ones did you plant?

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 4: bush beans, [Planted]

Q60 **Bush beans!** Let's not beat around the *bush,* most varieties of beans that can stand up by themselves are considered bush beans. You might divide them further into wax beans, drying beans, green beans, french beans, and so on but for now we'll just use bush and pole. There are *so* many kinds of beans we don't think we need to give you any pointers.

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 5: pole beans, [Planted]

Q61 **Pole beans!** If your beans need to climb up a pole or lattice for support, you might be planting pole beans. Don't worry, we've all *bean* there. Beans are kinda hard to separate into groups, so if you think you planted a pole bean, we'll agree with you. But uh, we'd like it if you could remember the name of your pole beans

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 6: broad beans, [Planted]

Q62 **Broad beans!** These beans are *beanormous!* They're good for eating fresh, dried, or even used as cover crops. They're also my favourite bean, so 10 points for you. You can find (Windsor, Horse, Agua Dulce) in stores. What did you plant?

_____

Display This Question:

If Beans and Peas! These magic fruit are so diverse, they get their own section. Don't let the tomat... = 7: soybeans [Planted]

Q63 **Soybeans!** *So ya bean* up to much lately? Most people plant these so they can steam them and eat them fresh, but it might be fun to let them mature and turn them into soy milk or tofu. These varieties (Tohya, Sayamusume) are the fresh-eating kind, but we'd like to hear about it if you planted something different too.

_____

Page Break

Q64 Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables? It's true, though, all of these vegetables are grown in greenhouses across Western Canada. Remember, click once on the word then select 'Planted'. If you've done it right, the word should turn green.

	Planted (1)
1: Tomatoes, (46)	
2: hot peppers, (54)	
3: sweet (bell) peppers. (56)	
4: cucumbers, (48)	
5: eggplants (49)	

Display This Question:

If Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables?... = 1: Tomatoes, [Planted]

Q65 **Tomatoes!** What did the late tomato say to the early tomato? I'll *ketchup.* There are an awful lot of tomato varieties, like cherries, grapes, strawberries, plums, cocktails, beefs, and typical vine tomatoes, so we're not going to even *try* and give you some examples of varieties. That's how much we *trust* you.

_____

Display This Question:

If Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables?... = 2: hot peppers, [Planted]

Q66 **Hot peppers!** Hey, what does a nosy pepper do? It gets *jalapeno* business. But of course, there are more spicy peppers than just Jalapenos. There are (Habanero, Scotch Bonnet, Anaheim, Ghost, Aji) and of course the world champion Carolina Reaper. What's in your garden?

_____

Display This Question:

If Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables?... = 3: sweet (bell) peppers. [Planted]

Q67 **Bell pepper!** You can also call it sweet pepper, no need to get *bell*-igerent about it. You can also call them names like (California Wonder, Pepperoncini, & Orange Sun) but we're interested in the names of what you planted. If you can't remember the name, even the colour will do.

_____

Display This Question:

If Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables?... = 4: cucumbers, [Planted]

Q68 **Cucumbers!** Why did the cucumber blush? Because it saw the salad dressing! Local favourites include (California Wonder, Pepperoncini, & Orange Sun) but we're pretty sure there're more varieties that people are planting. Care to share yours?

_____

Display This Question:

If Sometimes Greenhouse Vegetables: Can you tell we're struggling to find ways to group vegetables?... = 5: eggplants [Planted]

Q69 **Eggplants!** Oof, this is a tough one to pun. I'd need to be some kind of *aubergenius* to think of one. And now you've learned that some people call eggplants aubergines, so we've both gained something from this survey. Did you plant (Black Beauty, Long Purple, Piccolo) in your garden or do you prefer something else?

_____

Page Break

Q72 Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one big category. We were hoping you wouldn't find out, but you were too clever for us. Remember, click once on the word then select 'Planted'. If you've done it right, the word should turn green.

	Planted (1)
1: Brussel sprouts, (57)	
2: Broccoli, (48)	
3: Cauliflower, (49)	
4: Leek, (50)	
5: Celery, (51)	
6: Corn, (52)	
7: Artichoke, (53)	
8: Asparagus, (54)	
9: Okra, (55)	
10: Rhubarb, (58)	
11: Squash, (60)	
12: Zucchini (61)	

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 1: Brussel sprouts, [Planted]

Q73 **Brussels Sprouts!** Roast these quick and hot, with plenty of hustle and *brussel*, for the best flavour. Fun fact: Brussels sprouts get sweeter when they're exposed to cold temperatures, so the tastiest sprouts are found in the fall. We found (Gustus, Igor, Red Ball) as local varieties, but what did you plant?

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 2: Broccoli, [Planted]

Q74 **Broccoli!** Hey, what do you call broccoli that performs music characterized by continuous bass lines, dramatic contrasts, and monody? *Baroque-coli.* I feel like the set-up for that joke got away from me a little bit, but I know the musicians will appreciate it. Anyways, please write down the varieties of broccoli you planted. To jog your mind, we prepared short list (Centennial, Everest, Gypsy).

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 3: Cauliflower, [Planted]

Q75 **Cauliflower!** Eventually there was going to be a vegetable that I couldn't pun or make a joke about. Congratulations! You found it! It's cauliflower. It's just not very punny. Please write down the variety of cauliflower (like Snow Crown, Shasta, or Graffiti) that you planted below.

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 4: Leek, [Planted]

Q76 **Leek!** You might find it hard to water your plants if your watering can springs a *leek.* Surprisingly, leeks come in a bunch of varieties like (Bandit, Lancia, Varna) . Did you plant one of these, or something different?

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 5: Celery, [Planted]

Q77 **Celery!** Nothing says success like a six-figure *celery.* Six anythings of celery sounds impressive, to be honest. Unfortunately, we're only going to provide you with three (Summer Kintsai, Tall Utah). You can make it four, though, if you planted a variety of celery that's not on the list.

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 6: Corn, [Planted]

Q78 **Corn!** *Corn*gratulations on your *corn*siderable *corn*tributions to our research! Please *corn*tinue by writing down the variety of corn you planted last year, like maybe (Bodacious, Golden Bantam, Sugar Buns)

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 7: Artichoke, [Planted]

Q79 **Artichoke!** I'm getting all *artichoked* up by the thought of how much you're helping us out with this survey. It'd mean a lot to us if you could write down the variety of artichoke you planted last year. Here's a few as an example: (Green Globe, Cardoon, Imperial Star)

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 8: Asparagus, [Planted]

Q80 **Asparagus!** We get it, you planted a fancy asparagus crown last year, *as-spare-ag-us* the details. But seriously, we would like to know which variety it was. Was it (Guelph Millennium, Jersey Knight) or some other variety?

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 9: Okra, [Planted]

Q81 **Okra!** Aim for greatness, never settle for being medi-*okra.* Be our hero and write down the type of okra you planted last year. Was it (Burgundy, Clemson Spineless, Stubby) or was it something else?

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 10: Rhubarb, [Planted]

Q82 **Rhubarb!** What do you call rhubarb without culture? A *rhubarbarian!* Prove your cultural superiority by writing down the variety of rhubarb you planted, like (Holstein Bloodred, Sunrise, Victoria)

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 11: Squash, [Planted]

Q83 **Squash!** *Squash* any doubts about whether this sentence is a pun or not and just write down the variety of squash you planted. Yes, this includes winter squash, summer squash, butternut squash, acorn squash, spaghetti squash, kabocha squash, scallopini squash, *but not zucchini.* Because we thought that might confuse people. And let's not get started on whether wintermelon is a squash or a melon...

_____

Display This Question:

If Everything Else Vegetables. You got us, we ran out of ideas and put all the other plants into one... = 12: Zucchini [Planted]

Q84 **Zucchini!** No you don't get a pun for this one, because zucchini (or courgette) is actually a type of squash. We've made it a separate category, though, because we appreciate your help with our survey and want to make it easy for you to answer. *Thank you.* Now please write down the variety of zucchini you planted, like (Black Beauty, Jackpot, Raven, Goldy).

_____

Page Break

End of Block: Vegetables II: Everything Else

Start of Block: Miscellaneous Plants

Q85 **Section 4: Everything Else**

If you're disappointed that we missed something that you planted, now's the time to pile your disappointment on us! We've just got a few more questions about miscellaneous plants in your garden.

Q86 Did we miss something? Feel free to write in a vegetable that you planted and we forgot to include.

_____

_____

_____

_____

_____

Q89 Do you grow any edible flowers?

- ○ Yes (4)
- ○ No (5)

Q18 Do you grow any medicinal plants?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Do you grow any medicinal plants? = Yes

Q19 Really? Cool! What kinds?

_____

Q90 Do you grow any pollinator-friendly plants?

- ○ Yes (17)
- ○ No (18)

Q20 Do you grow any ornamentals? (You don't have to tell us what kind, flowers get kind of complicated)

- ○ Yes (1)
- ○ No (2)

Q21 Do you grow any perennial plants?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Do you grow any perennial plants? = Yes

Q87 Terrific! What kinds of perennials?

_____

Q88 **Lastly,** do you have any comments or suggestions for us? We'd love to hear from you.

_____

_____

_____

_____

_____

End of Block: Miscellaneous Plants

Appendix III. Interview Questions

Interview Script

Explain goal: Goal of the interview is to develop a snapshot that explains who runs it, what it looks like and similar information. We will provide this information to Botanical Garden so that they know how best to support your garden in the future.

Remember to collect a consent form.

What's the history of your garden?

When was the garden established?
Who established it?
What lead to the establishment?
What is the purpose/mandate of the garden?
How is this garden financed?

- Who decides how money is spent?

What is your garden's organizational structure?

Who makes decisions about the garden as a whole?
Do you have a garden administrator or an administrative group?
How would you self-classify your garden? (communal, individual plots in shared space)

Are there any shared rules, regulations, fees?

Who is allowed to join the garden?

Community-building?

Do you run any garden events?
Do you conduct any social or educational workshops?

How big is a garden plot?

Shared or individual?

What is the garden capacity?

What is the capacity of the garden? Are you at capacity? Waitlist?
How many people last year (roughly)

How big is the garden total (number of plots or acreage)?

Any shared infrastructure? (tools, shed, seeds)

*Does the garden gather information on what is being grown? i.e. what grows well/not well?

What are your garden's priorities moving forward?

(What is the garden's future goals?)

What do you need to meet these priorities?

(What do you need?)

Wrap-Up: Anything else you'd want to add?

What's the best way to reach a garden administrator?
Would you like a copy of our final report?

Appendix IV. Consent forms

All consent forms were submitted to SEEDS in compliance with our research ethics approval.

Appendix V. Garden Profiles

Acadia Park Garden

Acadia Park Garden was established in 1993 by UBC Housing, Plans and Operations. It was designed as a common area for families in Acadia Park to meet each other and build connections within the Acadia Park community. The garden is run by a three person volunteer committee who plan community social and educational events for garden members. The total garden space is ½ an acre, with plots for 70 families. This garden is a hub for the community, with children through grandparents coming and growing together!

(Acadia Park Garden Facebook Page, 2017)

Quick Facts:

Garden Purpose: to foster community and relationship building
Capacity and size of plot: 70 individual 8x10ft plots
Open/Limited Registration: Any family living in Acadia Park is welcome to apply for a plot
Fee: Annual $35 fee
Classification: Individual plots and communal herb plots
Events: YES! Monthly educational and social events
Contact Info: acadiaparkgarden@gmail.com or Acadia Park Facebook Group Page.

Michael Smith Lab Garden

Michael Smith Lab was established in 2017 by staff at the lab. The idea for this garden sprouted from a lone tomato that grew out of soil left behind after construction on East Mall Road. This inspired them to start a garden in the space in front of the buildings. The garden was made possible by the LC Workplace Initiative Grant from UBC. The garden is currently a communal 4x12ft plot, but aiming to grow and fill the open space in front of the building. Anyone from MSL is welcome to the produce and to be involved in the garden. This garden aims to create a space for social gatherings and to promote the gardening movement.

(Michael Smith Lab Instagram @guimoutou, 2017)

<u>Quick Facts:</u>

Purpose Statement: Fun space to increase community at MSL and increase awareness of gardening

Capacity and size of plot: One communal 4x12 ft plot, hopefully expanding soon!

Open/Limited Registration: Open to anyone in MSL and opening soon to FNH building

Fee: FREE!

Classification: Communal

Events: No, but aiming to have some in the future.

Contact Info: Email Guillaume at gdejean@msl.ubc.ca

Agronomy Garden

Agronomy Garden was established in July 2017 by Julian Villafuerte-Diaz. It was intended as a demonstration project along Main Mall to showcase a model for environmental and social stewardship. The garden has 4 boxes that each measure 8 x 4ft, and is overseen by a steering committee. The Agronomy Garden is free to join and is a great place to meet the community and create social networks!

(Julian Villafuerte-Diaz, 2017)

<u>Quick Facts:</u>
Garden Purpose: Opportunity to socialize and grow food
Capacity: 4 individual 8 x 4ft plots
Open/Limited Registration: Anyone who wants to garden and socialize
Fee: Free
Classification: Communal garden
Events: No, but aiming to have some in the future
Contact: agronomygarden@gmail.com

ANSO Garden

The ANSO Garden was established in 2014 by Kristin Sopotiuk. It was created on a rooftop space that was overgrown and neglected. Through a Sustainability grant and Human Resources Healthy Workplace place grant, the garden was made possible. Kristin is the garden manager alongside a committee of 2 people. The garden consists of 18 individual boxes that are 2 ft by 4 ft.

Quick Facts:
Garden purpose: Place to create healthy community and healthy employees
Capacity: 18 individual 2 x 4ft plots
Open/Limited Registration: Any students or employees in the ANSO building with an interest in gardening!
Fee: Free
Classification: Individual plots
Events: Not currently, but would like to in the future
Contact: soci.head@ubc.ca

GeoGarden

The GeoGarden was proposed in 2012 and established in 2013 by a group of enthusiastic geography students. Through a proposal submitted to the Geography Students Association and the Development Review Committee of UBC, this garden was made possible. There are two sections of the GeoGarden. Half of the plots belong to geography undergraduate students and the other half belong to geography graduate students, faculty and staff. The garden is composed of 6 communal plots that are 5 ft x 10 ft.

(UBC Geography Website, 2014)

Quick Facts:
Garden purpose: Meant as a teaching resource and area for community involvement
Capacity: 6 plots that area 5 ft x 9 ft
Open/Limited Registration: Any geography undergraduates, graduate students, faculty and staff.
Fee: Free
Classification: Communal plots
Events: Have in the past, but none recently
Contact: Undergraduate plots: GeoGarden Facebook Page or info@ubcgsa.ca
Graduate/Faculty/Staff plots: info@ubcgsa.ca

Orchard Garden

The Orchard Garden was formerly known as the "LFS Garden at MacMillian Building". It was a directed studies project established in 2007 by Lin Steedman to increase the awareness of the campus food system. The garden is run by a committee that consists of faculty members in LFS and Education, Plant Operations as well as students. The garden is a rectangular space that covers an area of 4000 ft2. The produce grown at the Orchard Garden is used by Agora Cafe as well as sold to the community.

(UBC Wiki, 2015)

Garden Purpose: to build awareness of the food system on UBC campus, as well as a teaching/classroom space
Capacity and size of plot: 4000 ft2
Open/limited registration: The garden is limited to practicum students, teachers and their classes
Fee: not applicable
Classification: communal
Events: Workshops, conferences, parties
Contact: theorchardgarden.info@gmail.com

Roots on the Roof Club

The Roots on the Roof Club is a student organization that manages the rooftop garden space and communal garden plots on top of the AMS Nest. Founded in 2014 as a quasi-replacement for the Orchard Garden, they aim to create a communal space that celebrates sustainable and just food systems through healthy relationships with food, each other, and the land. Work in the garden is performed communally by garden members, but they are led by a Core Committee composed of elected AMS executives and hard-working student volunteers. The club hosts workshops, events, and provides a Community Supported Agriculture program that feeds community members and campus food organizations. The main garden plot is 192 m2 and there are 5 'individual' garden plots available for personal use by members.

<u>Quick Facts</u>
Purpose Statement: Create a community hub focused around food, providing community engagement with the food system through events and workshops.
Capacity and size of plot: 192 m2
Open/Limited Registration: Only for Roots on the Roof members
Fee: $5/ year
Classification: Communal and individual plots
Events (Yes/No): Yes
Contact Info: rootsontheroof@gmail.com

Hawthorne Community Garden

Established in 2008, Hawthorne Community Garden was the first garden established by the University Neighbourhood Association (UNA). The garden is organized and run by the UNA and a volunteer Community Garden Committee. The garden consists of 76 plots of 6 x 9 ft each.

<u>Quick Facts</u>
Purpose Statement:
Capacity and size of plot: 76 6 x 9 ft plots
Open/Limited Registration: Must be UNA resident
Fee: Yes, amount unknown
Classification: Individual plots
Events (Yes/No): No
Contact Info: reception@myuna.ca

Rhododendron Woods Community Garden

Established soon after 2008 due to high demand and popularity of Hawthorne Community Garden, Rhododendron Garden was established by the University Neighbourhood Association (UNA). The garden is organized and run by the UNA and a volunteer Community Garden Committee. The garden consists of 27 6 x 9 ft plots.

Quick Facts
Purpose Statement:
Capacity and size of plot: 27 6 x 9 ft plots
Open/Limited Registration: Must be UNA resident
Fee: Yes, amount unknown
Classification: Individual plots
Events (Yes/No): No
Contact Info: reception@myuna.ca

Nobel Community Garden

Established in 2012, Nobel Community Garden was the third garden established by the University Neighbourhood Association (UNA). The garden is organized and run by the UNA and a volunteer Community Garden Committee. The garden consists of 20 small 5 x 5 ft plots and 56 large 5 x 10 ft plots.

<u>Quick Facts</u>
Purpose Statement:
Capacity and size of plot: 56 5 ft x 10 ft plots and 20 5 ft x 5 ft plots
Open/Limited Registration: Must be UNA resident
Fee: Yes, amount unknown
Classification: Individual plots
Events (Yes/No): No
Contact Info: reception@myuna.ca

Appendix VI. Infographic