UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program
Student Research Report

Agronomy Garden Expansion

Daniel Bateson, Yue (Stephanie) Fan, Grace Wang, Nuttamon (Belle) Wilaingam

University of British Columbia

Themes: Community, Food, Land

April 10, 2018

Table of contents

Executive Summary

The Agronomy Garden is a small student- run community garden that's located at the corner of Main Mall and Agronomy road. The garden is not only a place where people can grow their own food, but also a place where people can learn, interact and build long lasting friendships. As the garden has been operating for almost a year now, it's time to expand the area so the efficiency and productivity of the current garden can be further improved. In order to develop a comprehensive expansion plan, various research methods are used, including examining the current garden, conducting secondary research regarding best practices for community gardens as well as reviewing various regulations and guidelines. An electronic survey and one on one in person interviews are also conduct to find out what people desire for the expansion, such as the types of plants and facilities. In addition, the following report will also include a construction plan, a production plan, a harvesting plan, a distribution plan, waste management strategies, and a breakdown of the budget.

An electronic survey has been distributed via social media and email to obtain demographic users information of the agronomy garden as well as how the public would like the garden to be expanded. Results from the survey show that many are interested in the installation of picnic tables, shaded seatings, shared plot, and swings. In addition, around 50% of the respondents have indicated interest in seeing more herbs and root vegetables such as carrots and potatoes around the garden. Other popular plants include fruits, legumes and leafy greens. On the other hand, results from the semi- structured interviews with stakeholders have allowed us to identify some of the success and challenges that the garden has undergone in its first year. In addition, stakeholders would like to increase the productivity and functionality of the garden, create a welcoming space as well as increase student engagement. Lastly, findings from the literature reviews have provided us with insights regarding best gardening techniques that's suitable for the West Coast Climate. These include using raised beds as well as when to plant and how to group crops together.

Finally, this report will provide some recommendations for future actions and research in the area of conducting surveys, garden layout, garden committee organizations, and some possible collaborations with faculties and other organizations. To ensure the longevity of the garden, a committee with stable and devoted members must be established. For the garden layout, seatings such as swings, picnic tables, and shaded seating is recommended. furthermore, the addition of more shared plots is recommended and this can be done with raised beds. Raised beds also allow individuals to conduct independent projects while allow easy separation of different plants into different beds. Finally, working in the community garden can serve as an learning opportunity for students in other courses, such as LFS 350 or APBI 402. Lastly, future research regarding the expansion of the Agronomy garden may focus on larger sample size with participants from different faculties, instead of largely from the Land and Food Systems Faculty.

Introduction

Community gardens have a multitude of benefits. The first and most important principle that that we collaboratively decided on was education. There is a growing disconnection between the food system and people (Blay-Palmer et al. 107). With the encroachment of agricultural land into commercial and residential areas, agricultural is begin located farther and farther away from the urban cities. This results in a disconnect and people not being educated on the agriculture system which results in poor knowledge and understanding about food, farming, and the food system (Paraskevopoulos et al. 58; Blay-Palmer et al. 107). Education is fundamental when creating change and to create change in the food system and the roles we play in it, there needs to be education. With the expansion of Agronomy Garden, it can be used as an education tool for the campus and community to help educate and connect them to their food system. Additional benefits that community gardens provide is that it can help with environmental sustainability, human health, and create social sustainability.

The Agronomy Garden is a small community garden situated at the corner of Main Mall and Agronomy road which was constructed in July 2017. The Agronomy Garden's concept is to bring visibility to the campus food system as well as play a role in creating a sustainable and lively campus future through food. Our research aimed to help the Agronomy Garden develop an expansion plan that will encourage participation and community engagement from students of University of British Columbia and the surrounding communities and enhance the garden's role in the food system. This project exists as a continuation of a previous SEEDS project and with the ongoing growth of this garden, there will be more to come.

The expansion of Agronomy Garden will benefit both locally and to the broader society, contributing to food system policies like Food Policy Canada such as Food Secure Canada and United Nation Sustainable Development Goals (UN SDGs). In terms of locally, the Agronomy Garden will be promoting values of healthy well-being, celebrating culturally appropriate food, and encourage environmental stewardship. This contributes to the local social and environmental sustainability ("Vancouver Food Charter", n.d). In a global context, the Agronomy garden will contribute to the goals of UN SDGs through increasing the sustainable production and consumption of food, while also promoting healthy living at all ages. Moreover, the Agronomy garden will also provide a platform for high quality and equal education for all of the community members ("United Nation", n.d) . Most importantly, Agronomy garden will contribute to resilience of the food system both in the local city and at a global scale.

The goal of this project is to create a proposal document with designs for the expansion of the Agronomy Garden, construction plans, resources needed for the construction, production plan of the possible crops for the garden, harvesting plan, distribution plan, waste management strategies, and a breakdown of the budget. The proposal document will then be used to apply for a development permit/amendment of the current development permit. Our research objective are to (1) Find what people desires for expansion, (2) What kind of plants should be grown, (3) The type of audience/ community member the garden attracts, (4) Find out what the Agronomy Garden committee members themselves think the Agronomy Garden needs for expansion.

Small changes can have large effects. If people all grow produce in a sustainable way, there can be a huge overall positive environmental and social impact. This garden will be an

ongoing project for students, faculty, staff, and community members to enjoy for years to come. It will bring food production into a more central and visible space.

Methodology and Methods

The Agronomy Garden Expansion Project methodology is guided by the principles of Community Based Action Research (CBAR). CBAR can be defined as an iterative process of learning and change that provides people with the means to take systematic action in solving problems . This research methodology requires community and university collaboration to identify and define strength and opportunities, generate locally-produced knowledge, and devise and implement locally-appropriate actions to create mutually desired change. The goal of CBAR is to produce knowledge through open communication, produce action and change, and to give research back to the community in which it originated (Stringer n.p.).

The research is conducted through a "look-think-act" routine (Richer, n.p.). The look part involves gathering relevant information and building a picture where the situation is defined and described. Think revolves around exploring and analyzing the situation as well as interpreting and explaining. Act is where the project is planned, implemented, and evaluated.

In this project, primary and secondary data collection was used. In the secondary data collection, we used literature review to help up gather information about community and campus gardens. In the primary data collection, we made a survey for the public as well as interviewed Agronomy Garden Committee members.

Research Method: Literature Review

Before beginning this project and making plans, the first thing our group did was review the Agronomy Garden proposal plan by Julian Diaz to find out what the concept of creation of Agronomy Garden was – which was to generate visibility to the campus food system as an

opportunity to create a sustainable and lively campus future through food. This was an important first step for our group to gain the background knowledge needed for planning this garden and its expansion.

Another step for this project was to conduct background research on other community and campus gardens to learn what is being done especially in terms of production and harvesting, type of beds for growing plants, material used, budget, and waste management to help with our research goal. Additionally, literature review was conducted to investigate the role of community gardens and the strategies that have been successful and unsuccessful on a university campus. We used the SEEDS library, public realm plan and UBC Summons to find information that would further along our process in creating the expansion plan and to help with the permit process.

Past SEEDS projects were searched for in the online SEEDS Library using the keywords such as "Community Garden" and "University Food System." Local and international community gardens were also examined through UBC Summons and Google search engine with keywords such as "Community Garden", "Urban Garden", "Food Literacy", "Food Security", and "University/ Campus Food System."

Other secondary data sources that were used were the UBC bylaws, legislation, public realm plan, development permits on campus, and all the Agronomy Garden team's documents. The data that was collected through the UBC bylaws, legislation, public realm plan, development permits on campus was used to better understand what is needed for the permit process. The Agronomy Garden team's document was used as a foundation for our expansion proposal.

Research Method: Survey

One data collecting methods that we used is through online electronic survey which was designed in the Qualtric Software. The electronic survey are better than paper survey as it required less resources and time spent to print out all the survey. It also allowed for the participants to save the progress and come back to finish it later which we think will give us better quality answers rather than the participant rushing to complete it on paper and hand it in. We decided that online administration is the best option as it reaches the students throughout the campus while distributing in person may only reach certain group of participants for example, distributing in front of the MacMillan Building will mostly likely only reach LFS, Forestry and Engineering students, neglecting all the other faculties.

The survey will take around 5-10 minutes to complete, and the purpose was to identify the demographic of the University of British Columbia (UBC)'s Campus community that are or might be interested in Agronomy garden as well as gathering opinions and ideas for expansion of the garden that will benefits the community the most. Our expected sample numbers are 100 people, however, we only managed to collect 81 people. We administered the survey through means of social media which are Land and Food Systems (LFS) and UBC student Facebook pages. We chose to social media platform for the survey as it is where we can reach most of the student community especially undergraduate and graduate students. The response rate are much faster and in more quantity on the first 3 days of the distribution. As a result, on March 17th, we decided to repost the survey on facebook again in attempt to reach the students that may have missed the first post.

Moreover, we also distribute our survey through emails, which are sent out to the community by the LFS graduate office and Community Operational and Recreational Resident managers.

We decided that we can reach out to community resident and alumni that are not part of the student facebook groups, but is still a big part of the community that we needed to take into account. Lastly, we also use direct messaging method of administration.The survey was open for completion for the duration of one week, starting from March 14th to March 21st 2018. It was posted on social media in the afternoon when we predicted that it would be when the community are most active on Facebook and on checking email inbox.

Survey Questions

The survey started with a consent form to maintain ethical research practices. The consent form can located in Appendix (See Appendix A).

General information about the participants

These questions are asked to identify the demographic of the community so that we can see the general trend of the participant that are interested in the Agronomy Garden.

- What is your association with UBC?
- What faculty are you in?
- Do you live on campus?
- How long to you commute?
    - We predicted that participant that live on campus or less than 30 minutes commute to campus will be more interested in the Agronomy Garden
- Will you be on UBC Campus during the summer?

Community and Food system related

We predicted that the people that are interested in Agronomy garden are confident in their level of Food system knowledge as well as knowledge about community garden. These questions are asked to allow us to see the demographic of the community's members that the garden attracts.

- How well do you know the UBC Food System?
- What is your first thought when thinking about community garden?

- This question is asked so that we could see the perception of the participants on community garden in general. It was listed earlier in the survey before going into detail about the Agronomy garden itself to avoid and bias of the answers.

Specific to Agronomy garden

Questions related to Agronomy garden are asked so that we are able to gather data that can support and help us construct the deliverables for the permit. These questions help us extrapolate the future activities that will be happening at the garden as well.

- How did you learn about Agronomy Garden?
- What interests/ might interests you in getting involved at the Agronomy Garden?
    - This question is an essential part of the survey as it demonstrate the benefits of the Agronomy garden
    - This question will also provide us with information that will help us expand the garden in a way that gain more interest.
- Are you interested in getting involved with the Agronomy Garden?
- For our information, we would like to know more about why you are not interested in participating in the community garden?
    - This question is important as the answers provided can help the Agronomy garden team expand the garden while consider the reasons that they are not interested in.
- The Agronomy Garden is planning on expanding their space, what kind of space are you interested in?
    - This question is important in designing the layout plan that benefits the community the most.
- What types of plants are you interested in?
    - This question is essential as a part of our production and harvest plan

- If you are interested in being involved at Agronomy Garden, how many hours would you be willing to commit?
- What would you like to do at the garden during this time?
- Additional comments or suggestions in the expansion of the Agronomy Garden?

Research Method: Interview

In conjugation with the survey, we conducted interviews. We wanted to get an idea of what the Agronomy Garden Committee think that the Agronomy Garden needed for its expansion as they are the ones who have worked the most in the garden.

In order to get the information, we first contacted Julian Diaz through email, the creator of Agronomy Garden, to start off the interview and then used the snowball method to find the other 3 interviewees. We created a semi-structured interview to obtain qualitative data to allow for open discussion rather than simply a question and answer exchange between participants and researchers. The questions were kept to minimum and were semi-structured to maintain an open environment that promoted discussion. Questions can be found in Appendix B.

The interviews were with 4 of the Agronomy Garden committee members which comprises of 80% of the committee. The Face-to-Face interview completed by March 9th and Ethical Conduct and Consent Form completed and sent to Liska Richer. We choose face-to-face interviews as it allowed us to improvise additional questions that are build upon the answers of the standard interview questions. The interviewer can ask questions that are personalized for each interviewee to gain more insight about the Agronomy garden. We realised that each interviewee are very knowledgeable and the standard questions alone may not cover all the information we needed.

Results

Literature Review Findings

Through consulting literature about plant growth and gardening found using the Google search engine and UBC summons, we were able to find information about planning community gardens and plants that are best suited for the West Coast climate. There are many methods and techniques to growing vegetables, each with their own unique benefits and challenges.

In Vancouver, we found that raised beds would be the best option for growing vegetables in the wet cool region. Raised beds are beneficial as they prevent soil compaction, provide good drainage, and can warm up faster in the sun. It is recommended to be three to four feet wide by six to eight feet long so one can easily reach into the raised beds from the side without having to step into the garden and risk soil compaction (Nolan n.p.). Having rectangular shaped-beds would be easier to maintain and care for (Nolan n.p.).

There are many factors to consider when designing the garden and deciding the type and placing of plants. The most important principle to keep in consideration is that it's important to keep plants that have similar needs together (University of Illinois Extension n.p.). For example, eggplants, peppers, and potatoes are part of the Solanum family and prefer more acidic soils at pH 5.5-6.5 and should be planted together while Brassicas such as collards and kale want more neutral soil at pH 6.5-7.0 (Macdonald, "Companion Planting" n.p.). Additionally, perennials and annuals should be located in separate beds. Nevertheless, having contrasting plant growing together can be beneficial, for example, the chervil which is an excellent companion for Brassicas, lettuce, and radishes as it can repel slugs and attract parasitic wasps (Macdonald, "Companion Planting" n.p.). Another example pole beans, bush

beans can be a companion plant with Brassicas, carrots, radish, strawberries, and more as they fix nitrogen in the soil, however, pole beans and beets should not be planted together as they can stunt each other's growth (Macdonald, "Companion Planting" n.p.). There needs to be careful consideration of plants that can be planted well together and those that can not.

Determining the timing of when to plant is also important and dependent on the climate of the region. In Vancouver, the last average frost date is around March 28th (Macdonald, "Frost Days" n.p.). Therefore, vegetables that are frost -hardy such as carrots and cabbage can be planted earlier around February/March when the soil is no longer saturated. When the frost is over, squash and pepper can be grown. Thus, successive crops can be planted into the summer, with frost hardy vegetables planted in June or July, to be harvested into the fall, and kept for winter.

Survey Findings

Within the 81 participants, the community members, that took the survey, 72 are from UBC undergraduate which mostly comes from the Land and Food Systems Faculty and Applied Science (School of Architecture and Environmental Design). Many of the participant do not live on campus but usually commute less than 30 minutes to campus.

In the summer, the month that most people will be on campus is June and secondly, August. Using a cross tabulation analysis method from Qualtric Software, we found that people who live off campus are more interested in being a part of the Agronomy garden (figure 1). However, the people that are interested are mostly those that commute less than 30 minutes. The most preferable duration that the participants are willing to spent in the garden are less

than 2 hours.

		If you are interested in being involved at the Agronomy Garden, how many hours would you be willi...					
		Less than 2 hours a week	2-4 hours a week	5-7 hours a week	7-10 hours a week	More than 10 hours a week	Total
Do you live on campus?	Yes	10	5	2	0	1	18
	No	27	10	2	0	1	40
	Total	37	15	4	0	2	58
How long do you commute?	Less than 30 minutes one way	15	6	0	0	1	22
	30 minutes - 1 hour one way	6	3	2	0	0	11
	Longer than 1 hour one way	6	1	0	0	0	7
	Total	27	10	2	0	1	40

Figure 1: The correlation between student commute time and their interest in being involved with Agronomy Garden.

More participants are interested in the Agronomy garden in the initial phrase of the survey. Aspects of the garden that get participants to be interested are access to fresh produces, community engagement, save money on groceries and design project opportunities (figure 2).

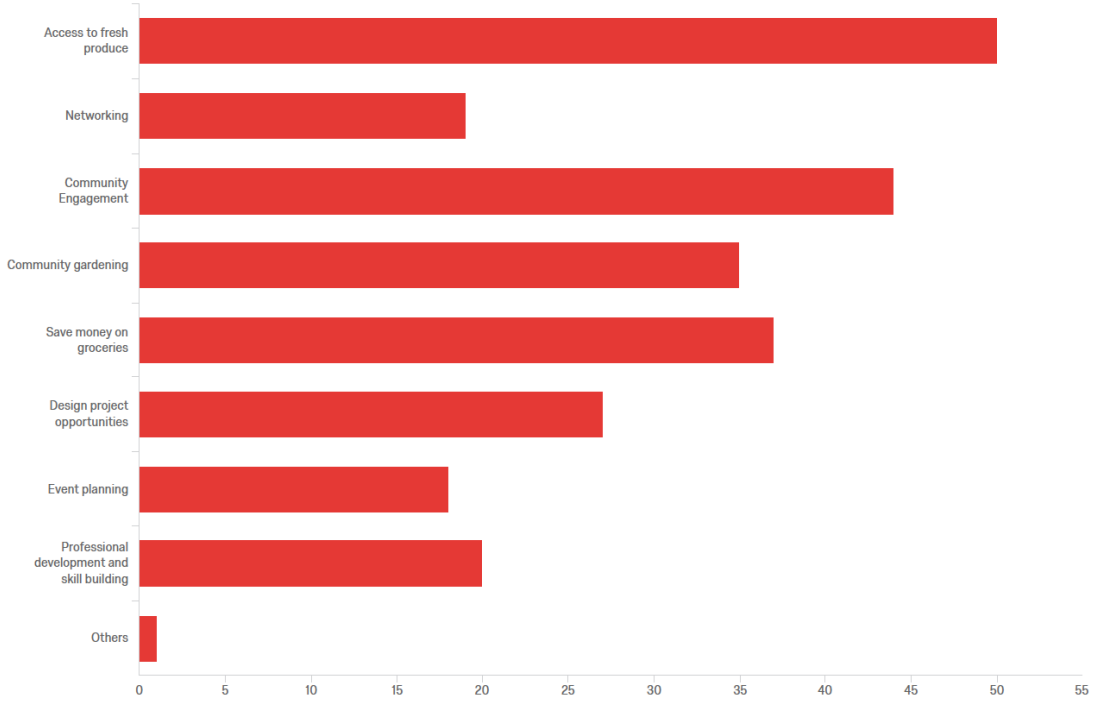


Figure 2: What interests people in getting involved at the Agronomy Garden.

However, distance or inconvenience and lack of time are the two main reasons many participants chooses not to engage with the garden. Another important reason is that many participants are already involved in another form of social activity ot community.

When asked what is the first thought when thinking about community garden, most answers are very positive, expressing the necessity of the community garden and highlighting the benefits it will bring to the community (figure 3). Words that are used most by participants are Community, Greenery, Local, Necessary, Social and Friendship. On the contrary, one person has viewed community garden as being unorganised.

Figure 3: Word cloud on people's first thoughts on community gardens.

After meeting with the Agronomy members team, we have come up with some expansions for the Agronomy garden will benefits the garden, reflecting on the garden's objective and purpose while also being cost effective. The expansions that interest the participants are firstly shared plots, and secondly with equal interests are picnic table, seating under shades and swings (figure 4).

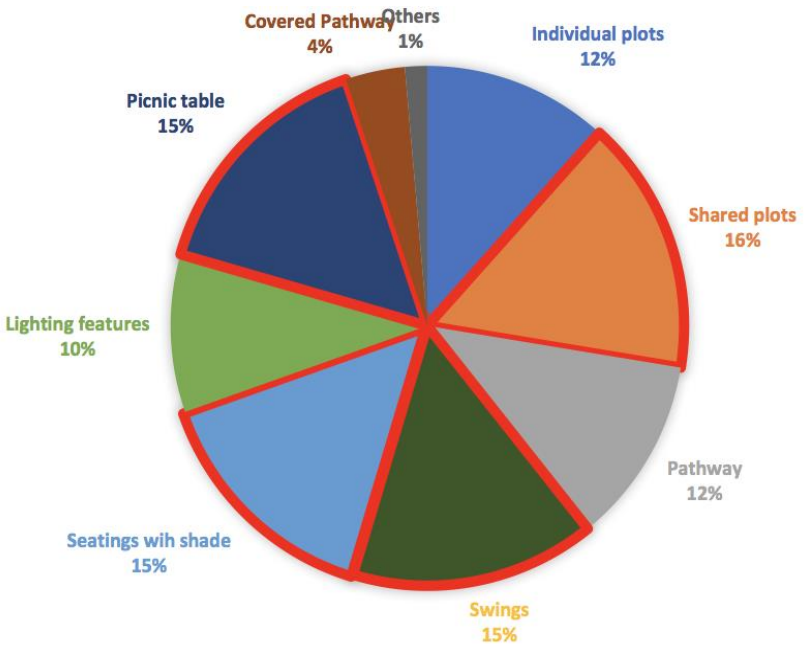


Figure 4: The type of expansion that participants are interested.

Root Vegetables and Herbs are the most preferable plants that the community want to be included in the garden (figure 5).

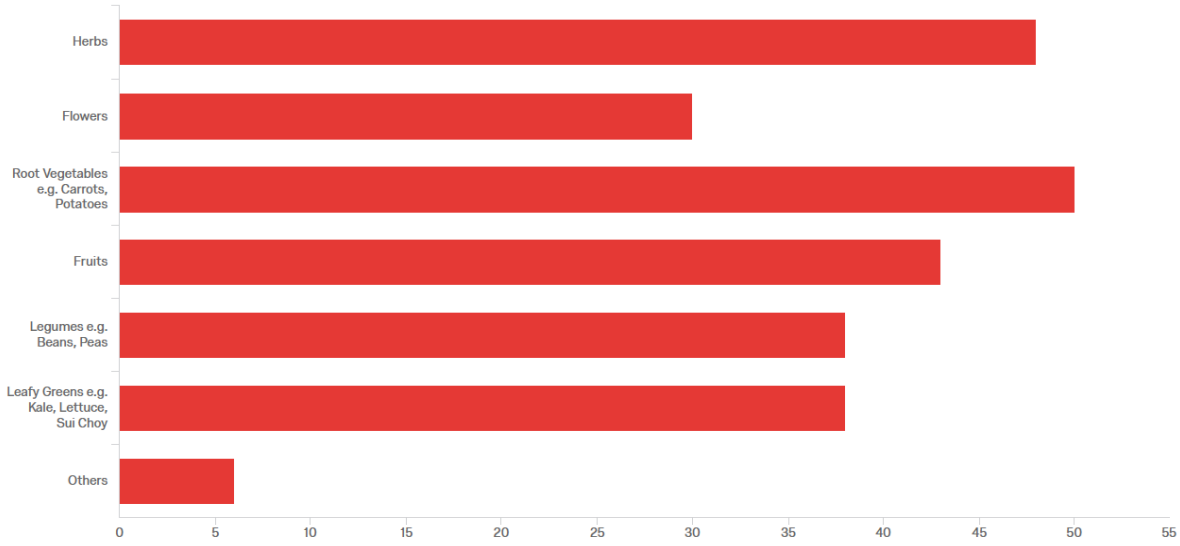


Figure 5: Types of plants that Agronomy Garden should harvest.

The participants are asked for additional comment that would contribute to the expansion of the Agronomy garden. Inclusion of signage is something the community want to see. Another comment is the need for accommodation of wheelchair accessibility.

Interview Findings

There were two major talking points in the semi structured interview, firstly was a review of the major strengths and challenges of the Agronomy Garden, and secondly a discussion of how the garden should be expanded (compiled interview answers can be seen in Appendix C). The expansion visioning questions focused on the functionality of the garden, the atmosphere, and student engagement to help guide discussion.

After conducting these interviews common answers were grouped and the most prominent and common answers were recorded as the consensus.

When asked about the about the greatest strengths most participants discussed these three main points. The most frequently mentioned strength was the passionate and dedicated community surrounding the garden, almost every interviewee gave mention to the dedicated planning committee and the continual efforts put in by them. The second major strength was consistent garden usage. Many participants talked about how the garden was always busiest and most notable when it was in use. Many of them even joined after seeing the garden in use and meeting some of the students using it. Finally the last strength is the gardens welcoming atmosphere and high visibility. The garden is a very public space and it attracts many curious passersby into the space.

When asked about the challenges of the Agronomy Garden most answers discussed engagement and usage issues. The first challenge is the desynchronization of the growing season from the busiest school semesters. There are far fewer students on campus during the summer and it makes it difficult to grow community around the garden. Another challenge is ensuring the succession of roles over time. The Agronomy Garden is very new and has not dealt with change yet, because of this many interviewees identified knowledge sharing and

assumption of responsibilities as areas of concern. Finally, some interviewees found it difficult to assign new members responsibility or ownership in the club due to the size. With few shared plots there was not always enough work to keep a large group consistently engaged. This was not a major challenge this past year, however it is important in the context of further expansion.

When participants were asked to imagine their ideal Agronomy Garden expansion they were lead to focus on three main areas. The first area was production and functionality, this area focused on physical facilities and structures at the garden. The major desires in this category were more shared plots, trellises (or a vertical component to the garden), and more compost bins. The next area of focus was atmosphere, this included the sentiments that the expansion should evoke as well as fixtures to facilitate it. The major idea was to emphasize the welcoming nature of the garden, to do this many interviewees proposed a shaded seating area, as well as a lighting fixture. A tree swing has also but would need to be structurally approved beforehand. Finally, the last area was student engagement, this includes programming and physical items to help the Agronomy Garden communicate more with the community. The major ideas included a path through the garden (diagonally between Main Mall and Agronomy Road), increased social media presence, enhanced signage, and additional programming and outreach. In all these semi structured interviews allowed our team to get a more comprehensive understanding of what stakeholders valued most in the expansion plans.

Discussion

Survey

Most people that are interested in the Agronomy Garden are living off campus. This could be because participants living on campus may already have many opportunity to create a community of their own such as in student housing, while it may be slightly harder for

commuter. It is also expressed in the findings that one of the reason many participants choose not to engage with the garden is due to the fact that they are already engaged in another form of social activity. Moreover, many commuters are not first years, as many first year choose to live in student housing especially international students. The housing do not have kitchen which may be why fresh produces will not appeal to them. As a result, when constructing a harvest plan, we will include many plants that can be consumed or prepare without needing a kitchen.

An average time that participants are willing to spend are usually less than 2 hours and most people that are interested only commute within 30 minutes. This illustrated the need for expansion such as seating platforms that encourage participants to engage with one another as well as providing resting place. Many participants lack time for engagement, which may be as a result of the commuting as well. It is therefore important that the expansions are unique to the Agronomy garden, making the time spent there valuable for the community.

Opinions about community gardens in general are very positive, with words like community, social, local, necessary and friendship. These words reflect the needs for social activity from the community members. Additionally, many of the expansions that interest the participant such as seating under shades and picnic tables also encourage social interaction. This emphasises how the Agronomy garden can contribute to the social sustainability of the UBC campus. However, one person has expressed concern over the garden being unorganised, reflecting on the problem due to lacking the engagement for long term for maintenance of the garden that we need to keep in mind throughout the production and harvest plan.

The expansions shared plots and pathway through the garden as well as the word ‘Greenery’ expressed by many participants also reflect the participants’ desire to interact with nature and the environment. The garden therefore, will also contribute to environmental sustainability of the campus as well.

Interview

During the semi structured interviews there was a lot of discussion regarding the current state of the Agronomy Garden and how best to expand it. Many of the participants had already done some visioning and planning as a group earlier in the year and it was obvious that they had previously discussed some form of expansion. This was most obvious when discussing the production and functionality, as well as the atmosphere aspects of the expansion. The most interesting parts of the interview centered around the student engagement section of the expansion plan. This area directly addresses one of the major challenges for the garden which is engaging with the few students around in the summer and it was interesting to see different peoples ideas. Probably the most interesting conversations surrounding this question came when speaking to Julian Diaz the founder of the garden regarding the clubs organizational structure. He discussed how improving the organization of the planning committee to better define roles and expectations could help increase student engagement by making the Agronomy Garden more organized and efficient. The main argument was that the Agronomy Garden could provide more programming, skilled knowledge, and consistency to prospective gardeners by improving the internal organization and by creating specific portfolios and positions. After this discussion, Julian and I discussed the organizational structures of a few other student run community garden with the hopes of restructuring the Agronomy Garden in

the future. Overall most of the participants focused on building upon the Agronomy Gardens welcoming atmosphere and by addressing the need for more student engagement.

Conclusion and Recommendations

Summary

In conclusion, the central findings of this project are:

I. From literature, we consulted garden literature to figure what types of plants would best best grown in the Vancouver climate zone and the timing of the planting. This can be seen in the recommendations.

II. From the survey, we found that most people would like seating such as swings, picnic tables and seating under the shade as well as more shared plots.

III. From the interview, we found out that the garden is in need of having a vertical gardening component such as trellises, more compost bins/system, and more shared plots for increasing its productivity and functionality.

IV. The interview also indicated that building an atmosphere that is welcoming and inviting space is one of the main concepts that they are aiming for. A lighting fixture such as a lamp, lantern, or string fairy lights is a potential ways of doing it.

V. An increase of student engagement can be done through interactive signage, outreach and programmings or events, consistent social media presence and having an up-to-date website. Additionally, having a pathway through the garden can also increase the presence of the garden and can peak interest in it.

Recommendations for Future Research:

In terms of recommendations for research. We recommend that there needs to be a wider sample group for the survey. 42.25% of the people who answered the survey was from LFS

and to get a better understanding on what the campus needs. This can be done through more advertisements online in different faculty facebook pages or newsletters or another way is through in-person surveying at the different faculty buildings around campus.

Recommendations for Action and Implementation:

In terms of the garden layout, we recommend have more seating space as seating has a combined vote of 45% (15% for swing, 15%% for seating under the shade, and 15% for picnic table) on our survey. Having seating area throughout create the relaxing and inviting social space. Shared plots was also a top choice at 16% in our survey. Having shared plot would also create more of a sense of community engagement and it can also be a catalyst in creating new friendships for students. Raised beds, the same as the ones current used in Agronomy Garden, should be used for more plots. The low maintenance raised beds will be easier to care for by a rotating student membership. The raised beds will also easily provide designated separate sites for various plants and student groups.

Another recommendation we have can be seen as more of a community engagement section but the garden can be seen as an educational opportunity for students. Being close in proximity to campus classes, the garden is a directly accessible production system for students to learn from. For example, students can take soil samples to determine the nutrient availability/soil assessment. Plant propagation and compost monitoring are also potential educational activities. Additionally, continuous collaboration and communication with other community and campus gardens are encourage. Having communication will open different resources that Agronomy Garden may not have that other gardens have and vice versa. This allows for the sharing of knowledge.

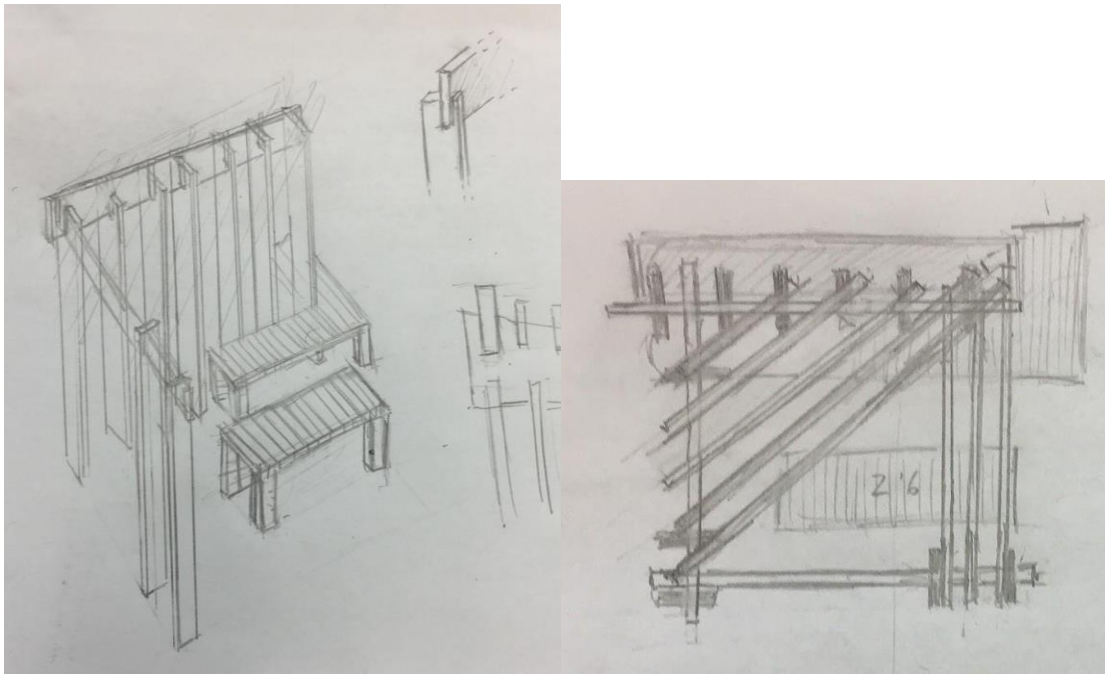
Lastly, this was a recommendation that we thought would be useful for the Agronomy Garden committee itself. For the future of the Agronomy Garden management team, we recommend that they have one faculty member and maybe one staff member to provide some stability, since the involvement of students will be rotating, especially when students graduate.

Layout of Expansion

Figure 6: Preliminary sketches of expansion

In the visioned Agronomy Garden expansion there would be 4 new raised beds, a seating area, and a large compost box (not pictured). Two of these boxes would be inline with the 4 that already exist while two more would extend out west from the southern row of boxes, make a weird ‘L’ shape. In the nook of this ‘L’ would be the proposed seating area.This pergola would include benches, a shaded or covered area, as well as trellising for vining and climbing plants. Included are some preliminary sketches of the proposed seating area (figure 6). It is likely that the large shrub between the garden and the annex building will need to be trimmed back to allow space for the pergola. Not included in this layout is the compost bin which would be closer to the annex building. These designs and sketches were created by

Ryan Bednar and Gavin Pattman, two of the Agronomy Garden organizing committee members and were based off of the results of our semi structured interviews and surveys. The exact design and layout could potentially change depending on the feasibility of building these structures, and approval by the land use committee. The final layout of the Agronomy Garden will ultimately need to be ratified by the organizing committee as they will have the final decision in terms of vision and preferences.



Resources Needed and Budget

The exact amounts of and types of each construction material is not exactly known currently however, a general budget based off of the costs of the original Agronomy Garden materials has been created to help estimate the approximate cost of the expansion.

Construction Costs	
Item	**Budget ($)**
Lumber for raised-bed planters, pergola, compost box and edging	1300
Power Tool Rentals	200
Hardware (screws, nails, hinges, etc)	40

Soil	400
Mulch	100
Mileage/gas fees for vehicle	100
Miscellaneous tools and services (landscaping/shrub removal)	200
TOTAL ($)	***2,340***
Running Costs (monthly)	
Seeds	50
Stakes, Trellises	20
Material replacement	20
Mygreenspace subscription	2.8
Mileage/gas fees	30
TOTAL	*122.8*
TOTAL for 3 months	***368.4***
GRAND TOTAL ($)	***2,708.40***

Production Plan

List of plants to be included in the garden

- Herbs
    - Basil
    - Chives
    - Cilantro
- Root Vegetables
    - Radishes
    - Beets
    - Carrots
    - Garlic (Over Winter)
- Other Recommended Vegetables
    - Lettuce
    - Peas
    - Baby Spinach
    - Bush Beans
    - Kale
    - Cucumber
    - Summer Squash

We take into account the survey findings, which shows that majority of the community members would like to see Herbs and Root Vegetables in the Agronomy garden. We, therefore, provided a list of climate suitable herbs and root vegetables as well as other diverse

recommendation that are nutritious and easy to grow and maintain. Easy to grow plants are important as it will not discourage first time volunteers if things didn't turn out the way they want. As many participants have stated, 2 hours or less is the maximum they would spend in the garden per week. Plants that are easy to plan will be beneficial during maintenance. Some of the plants we recommended (Carrot and Kale etc.) can be prepared or consumed without kitchen facilities which is suitable for first year students living in campus housing that lack kitchen. This not only encourage healthy eating in the student community but also provide platform for community engagement such as through exchanging simple meal preparation methods and educating each other on how to grow food, strengthening the social sustainability of the UBC Campus.

Harvest Plan

Through our literature review and our survey, we recommend the crops which are suitable for Vancouver's climate as well as easy to grow. As the garden expands, there is an opportunity to to add more crops to the rotation. There is no specific rotation that needs to be followed in our recommendation, and the crops they decide to choose to plant will be up to the Agronomy Garden and what they deem as needed at that moment. This harvest plan will outline anticipated when specific crops should be planted and harvest dates.

Crop	**Timing**	**Harvest**
Lettuce	Sow in April Sow in August	June September/October
Peas	Sow in early March	July
Baby Spinach	Sow in March 1 to April 15 Sow in middle two weeks of August	Pick when the leaves are 7-10 cm for baby greens September/October
Carrots	Sow in April	July
Bush Beans	Sow in May	June-July

Kale	Sow in March to mid-July	Throughout the summer
Beets	Sow in late April Sow in mid-July	June September
Radishes	Sow in March/April Sow in August	June September
Cucumber	Sow in May	August
Summer Squash	Sow in late May or early June	September
Basil	Sow in late-May or early June	Throughout the summer/fall
Chives	Sow in May (late spring)	Throughout the summer/fall
Garlic	Plant in late October or early November	June/July

Distribution Plan

In order to implement an effective distribution channel, it's important to designate a point person who will manage work related to crops distribution. He or she will determine the harvest date, distribution date, the duration which crops are available for distribution and the type of crops available. He or she will then communicate these information to committee members and volunteers. Nothing should be taken from the plot until the point person has informed everyone that the crops have ripen and are ready to be harvested and distributed (RIT Community Garden 1-3).

Upon harvesting, crops from the garden should be divided into equal shares. Members and volunteers of the garden are only allowed to take one share at a time until the shares are gone. In addition, it's important to set a time frame regarding when shares can be claimed as some crops are highly perishable. When everyone has claimed his or her share, surplus crops can be made available for sale or for donation. To claim the crops, members and volunteers must report to the point person and prove that they have taken care of any work that needs to be done in their own plot(s) before they can claim the share. In addition, the point person must keep a record of distribution. These include the name of the person who has claimed the

share, how many shares are claimed by that person, as well as the date it happened (RIT Community Garden 1-3).

Surplus crops

Surplus crops can be made available for sale or for donation. Although it's best to transfer surplus harvest as soon as possible, this is not always possible. Before delivering the crops to the food bank, crops should be sorted and stored in the garden's storage room. Excess dirt on the crops should be shaken, rub, or brush off with a clean and dry towel instead of being soaked or sprayed. Then the crops should be separated into different containers with date of receipt (i.e.) Day 0) labeled to maintain the traceability of the crops. Fruits and vegetables like tomatoes, potatoes, and onions need to be stored in a cool, dry, pest- free, well-ventilated area. On the other hand, leafy greens like lettuce varieties and kales should always be refrigerated once harvested (Food Banks Canada 25).

Finally, crops should be stored and transported in food grade containers to prevent leaching of chemicals into the crops. A clear record of the harvest date, the type and quality of crop, name of the food bank, date of delivery, as well as the deliver and receiver's name should be kept (Food Banks Canada 24).

Donating surplus crops

A donor- recipient matching system needs to be set up to promote the use of surplus crops before it gets perished. The point person from the donor organization, the Agronomy Garden, should contact recipient organizations and request pick- up of the surplus crops. The Agronomy Garden committee can also post available crops on their social media along with the contact information of the point person. This way, if organizations are interested in a particular crop, they can contact the point person to arrange a pick up time. Similarly, organizations can email the point person to state their needs, if the crops become available, the point person could match the offers with needs. Note, it's important to ensure that the

amount of crops donated is appropriate for the recipient organization so that all the crops donated are used instead of going to the waste (Farahbaksh 113). Finally, obtaining feedback from partner organizations is important. Many organization do not like to give feedback as they fear the donor will discontinue its donations. However, feedback is important as it's a great way to gain understanding about the organization's' needs (Farahbaksh 114).

In the case where there may be insufficient demand for crops from organizations, other channels can be explored. This include selling the harvested crops in discounted grocery stores. This is beneficial as making surplus crops available in discounted grocery stores could de-stigmatize the experience of obtaining low- cost goods. Also, it's a great way to introduce more nutritious and sustainable produced food to low- income people.

Waste Management

New compost bin should be built next to Annex Building as the location close to the building will help captures the heat and speeds up the decomposition in the bin. The compost must be turned occasionally and then can be spread on the garden.

The new compost should use the bin method as that is that would be the easily to obtain and maintain. The three-chamber bin or drum/barrel compost bin could be used. The three chamber is efficient and durable. The three-chamber bin works like an assembly line where there are three batches of compost that are in various stages. Usually the compost material will start at the first bin for around 3-6 weeks before being turned into the middle bin for another 4-8 weeks and lastly, the compost in the middle is turned to the end bin to finish composting before using at 6-16 weeks (University of Minnesota Extension, n.p.). The benefits of the three-chamber methods is that it allows for large quantities of compost to be worked with and it's easy to camouflage at the side of the building, however, it is not

mobile, manual turning is required and can be labour intensive. The barrel composter is an excellent choice for a small urban garden as it generates compost in a relatively quick time and it's very easy to mix and turn compost materials (University of Minnesota Extension, n.p.). It requires the compost to be mixed every few days to allow for air penetration and can make compost within two to four methods (University of Minnesota Extension, n.p.).

Initially, it is recommended that the layering system is adopted, layering the base layer with straw, leaves or woody brush material which help increase air circulation. Furthermore, another alternative layer is of green (nitrogen-rich) as well as brown (carbon-rich) materials should be added to promote healthy compost. This process can be repeated till the bin is full. Some examples of these materials are cardboard and fresh grass clippings. For best aeration and fast heating, the bin should be mixed every week or two. This in addition with the location of the compost bin, as mentioned, will help speed up decomposition. It is essential to make sure to add water to the compost if it is very dry after mixing. The compost will then be ready within 2-3 months. Cautious steps to take are to firstly, make sure there is no bad odor, if so, treated by adding coarse, dry material like straw and corn stalks into the mix. Secondly, if the compost is not heating up, mixing green materials such as grass clipping and blood meal can help increase the nitrogen and so the heating process. Lastly, to prevent pests around the bin, avoid adding meat, fats and other animal waste into the mix, as well as covering the mix as much as possible. To avoid flies, fruits and vegetables scraps are recommended to be put towards the center of the bin and cover with brown material, as mentioned, or with soil (MetroVancouver, n.d).

References

Blay-Palmer, Alison, et al. *Nourishing Communities: From Fractured Food Systems to*

Transformative Pathways. Springer, New York, 2017, doi:10.1007/978-3-319-57000-6.

Farahbakhsh, Amy. "The greater good: Integration in a surplus food management system." *Western University (2012).* PDF file

Food Banks Canada. "Community Gardens Toolkit". n.d. https://www.foodbankscanada.ca/getmedia/de53293a-2fc3-4e42-82e6-60da8fcb2558/Community-Gardens-Toolkit-v2.pdf.aspx.

Macdonald, Mark. "Companion Planting." *West Coast Seeds,* 28 May 2017, www.westcoastseeds.com/garden-resources/articles-instructions/companion-planting/.

Macdonald, Mark. "Working with Frost Dates." *West Coast Seeds,* 13 Sept. 2017, www.westcoastseeds.com/garden-resources/articles-instructions/working-frost-dates/.

MetroVancouver. Here's The Dirt, Backyard Composting. Vancouver: Services and Solutions for livable region. Print.

Nolan, Tara. "6 Things to Think about before Preparing a Raised Bed Garden." *Savvy Gardening*, 4 Apr. 2017, savvygardening.com/preparing-a-raised-bed-garden/

Paraskevopoulos, S., S. Padeliadu, and K. Zafiropoulos. "Environmental Knowledge of Elementary School Students in Greece." *The Journal of Environmental Education*, vol. 29, no. 3, 1998, pp. 55-60.

Richer, Liska. "Community-Based Action Research." *Canvas.* 10 Jan. 2018. https://canvas.ubc.ca/

RIT Community Garden. "Adopted Distribution Plan." 2010. http://www.rit.edu/affiliate/communitygarden/Proposed_Distribution_Plan_v1.pdf.

Stringer, Ernest T. *Action Research.* Sage Publications, Thousand Oaks, Calif, 1999.

University of Illinois Extension. "Successful Container Gardens." *Pick Plants with Similar Requirements - Choosing and Combining Plants - Successful Container Gardens - University of Illinois Extension,* extension.illinois.edu/containergardening/combining_requirements.cfm.

United Nations Department for Economic and Social Affairs. Sustainable Development Goals Report 2017. United Nations, 2017

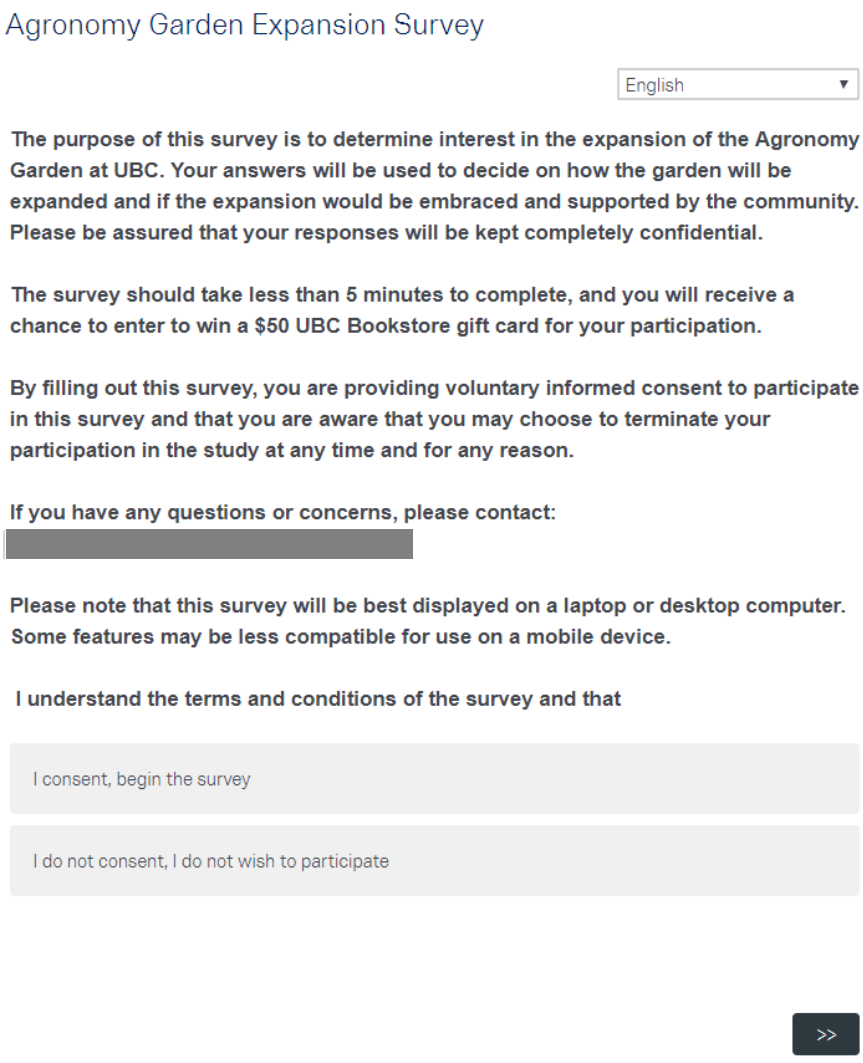
University of Minnestoa Extension. "Composting Structures." *Composting Structures: Yard*

and Garden: University of Minnesota Extension, www.extension.umn.edu/garden/yard-garden/soils/composting-and-mulching-guide/composting-structures/index.html.

"Vancouver Food Charter". Jan. 2007, vancouver.ca/files/cov/Van_Food_Charter.pdf.

Appendix

Appendix A: Survey Consent Form



Agronomy Garden Expansion Survey

English

The purpose of this survey is to determine interest in the expansion of the Agronomy Garden at UBC. Your answers will be used to decide on how the garden will be expanded and if the expansion would be embraced and supported by the community. Please be assured that your responses will be kept completely confidential.

The survey should take less than 5 minutes to complete, and you will receive a chance to enter to win a $50 UBC Bookstore gift card for your participation.

By filling out this survey, you are providing voluntary informed consent to participate in this survey and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

If you have any questions or concerns, please contact:

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

I understand the terms and conditions of the survey and that

I consent, begin the survey

I do not consent, I do not wish to participate

>>

Information has been redacted from this report to protect personal privacy. If you require further information, you can make an FOI request to the Office of University Council.

Appendix B: Interview Questions

Name:
Date:
Interviewer:

AG Interview Questions

Introduction Questions:

How did you first become involved with the AG and how do you interact with the space?

What does the AG mean to you, and why is it important?

What has been the AGs biggest success and greatest challenge in its first year?

Expansion and Vision:

What is your favourite part about the AG right now?

How would you describe the ideal AG garden (feelings, features, and interaction)?

What are some specific and realistic improvements that would like to see in the AG?

Production and Functionality:

Atmosphere:

Public Engagement:

Please prioritize which aspects are most imperative to you when planning an expansion

What aspects of the AG do you think impact people the most?

Wrap up:

What will ensure the AG long term success moving into the future?

Appendix C: Compiled Interview Answers

Name:
Date:
Interviewer:

AG Interview Questions

Introduction Questions:

How did you first become involved with the AG and how do you interact with the space?

- 2 Major forms of initial involvement:
  - Helped establish the garden
  - Saw people working in the garden and got drawn in by the community
- Interactions
  - Creative space (design/building)
  - Social gathering
  - Gardening
  - Example of proper usage of public space

What does the AG mean to you, and why is it important?

- Community and social space
- Education and Visibility for Food issues
- Sets precedents for students to use public space
- Space for experimentation and student initiatives

What has been the AGs biggest success and greatest challenge in its first year?
Successes: - It happened

- Collaboration across campus groups
- Passionate and tight knit community

Challenges: - Building a larger community

- Longevity (usage and organization)
- Growing Season does not align with student schedules

Expansion and Vision:

What is your favourite part about the AG right now?

- Visibility and accessibility of the space
- The platform!
- People just hanging out in the Garden (non food focused hangouts)

How would you describe the ideal AG garden (feelings, features, and interaction)?

- Welcoming/Inviting
- Innovative and Collaborative
- Trellises
- Shaded seating area
- Self Sufficient
- Joyous

What are some specific and realistic improvements that would like to see in the AG?

Production and Functionality:

- Trellises
- More Planters (Shared)
- Compost bins
- Shaded area (Pergola)
- Pollinators

Atmosphere:

- Lighting Fixture
- Shelter and Seating Space
- Welcoming/Inviting
- Home

Public Engagement:

- Path Through Garden
- Signage
- Chalk/White/Message Board
- Social Media/Website
- Scheduled Programming
- Outreach programs (schools/preschools)
- Public Events
-

Please prioritize which aspects are most imperative to you when planning an expansion

What aspects of the AG do you think impact people the most?

- Seeing plants/people in the garden generates lots of interest
- Strong Community
- Interactive and Innovative

Wrap up:

What will ensure the AG long term success moving into the future?

- Organizational Resiliency (already happening)
- Strong community of volunteers
- Knowledge Transfer and Succession planning