

**Practicing Urban Agriculture Right Here: Integrating the LFS Garden with the Faculty of
Land and Food Systems Community**

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Scenario 5

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Community*

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Abstract

The earth's escalating human population and subsequent resource consumption levels are posing increasing pressures on global food security and environmental sustainability. Urban agriculture can be viewed as one tool to help cities alleviate the ecological, social, and nutritional challenges associated with rapid urban growth (Halweil & Nierenberg, 2007). The University of British Columbia Food Systems Project (UBCFSP) is a collaborative, community-based action research (CBAR) project, which aims to implement sustainable practices within the university campus food system, thus softening the campus' impact on natural resources. As one component of the UBCFSP, this paper outlines student attempts to initiate urban agriculture (UA) in the form of an edible campus garden. Methods of data collection include interviews with stakeholders, online and literature review, and soil sampling. Achievements include a garden design, production/harvest/distribution plan, temporary garden sign, partial committee formation, soil tilling, and potato planting. Based on our research and concurrent actions, the potential for the Land and Food Systems (LFS) Garden to be a successful initiative has been acknowledged and various recommendations for UBCFSP stakeholders and future AGSC 450 students have been created for future consideration and implementation.

Introduction

The University of British Columbia Food System Project (UBCFSP) is a collaborative, community-based action research project completed by fourth-year students in Agricultural Sciences 450: Land, Food, and Community III. The UBCFSP aims to assess the feasibility of transitioning toward a sustainable UBC food system (Richer & Project Partners, 2008) by involving multiple partners and collaborators, which include UBC Food Services (UBCFS), Alma Mater Society Food and Beverage Department (AMSFBD), UBC Sustainability Office (SO), UBC Waste Management (UBCWM), UBC Campus and Community Planning, Sauder School of Business classes, Centre for Sustainable Food Systems at UBC Farm, UBC Social Ecological Economic Development Studies (SEEDS) program, and the Faculty of Land and Food Systems (FLFS) (Richer & Project Partners, 2008).

Scenario five of the UBCFSP in 2008 seeks to promote urban agriculture (UA) at UBC by enhancing and expanding a garden started through an undergraduate student-direct study. The guiding vision is to create an edible landscape that enhances FLFS community, provides a functional micro-model of sustainable food procurement, and offers a setting for hands-on

education. Such a garden would contribute to sustainable urban food system development by showcasing the three pillars of food sustainability (UBCFSP Model). Decreasing food-miles by providing food to the community address the ecological aspect. Ensuring the land is valued through the purchasing of vegetables and herbs addresses the economic aspect. Bringing individuals from across campus to create awareness, utilize the land for learning, or simply enjoy green space addresses social sustainability.

This paper creates an action plan for the LFS Garden in the form of recommendations and specific tasks to be carried out. These recommendations are hope to bring about the realization of the expanded LFS Garden such that it can function as an educational resource for all UBC students and purvey herbs and vegetables for Agora Café and the Agriculture Undergraduate Society's (AgUS) community. Cumulatively, the LFS Garden will enhance the UBC Point Grey campus contributions to sustainable urban food systems (Richer & Project Partners, 2008).

This report begins by outlining the main goals of our project, discussing how our research is connected to broader issues in the food system and reflecting on the UBCFSP vision statement. The report will describe the methodology used to address questions related to landscape design, garden maintenance, waste management, educational collaborations, and partnerships with Agora Café and AgUS. Finally, this report will include findings and offer recommendations to UBCFSP partners and future research groups who will further bring this project forward.

Problem Statement

Population growth, urban sprawl, and escalating consumption levels are shrinking the world's agricultural land resources, jeopardizing the earth's ability to feed the planet (Richer & Project Partners, 2008). Urban agriculture can be viewed as a tool to help cities cope with a range of ecological, social, and nutritional challenges associated with rapid sprawl and urban migration,

however; intense competition for land has decreased green space and subsequent food production (Halweil & Nierenberg, 2007). The lack of urban food production is associated with a multitude of problems such as, decreased local food availability, disconnection between consumers and producers, increased food miles, and climate change.

UBC is often perceived as being a role model for environmentally friendly campuses, which is why we have the responsibility to lead by example. For that reason, our main task for the UBCFSP 2008 is to integrate the LFS Garden with the FLFS community so that it can act as a demonstration site of a small-scale local, organic food production system in addition to serving as an educational tool. The LFS Garden has the potential to create awareness and start a ripple effect of knowledge and empowerment. Our group believes the development of the LFS Garden will provide a micro-scale local model for addressing global issues surrounding health and sustainable land and food systems.

Vision Statement

As a group, we originate from diverse fields and backgrounds; however, we share the same value assumption – weak anthropocentrism. Although we place human satisfaction above all things, we understand that the well-being of human beings is ultimately dependent on the health of the environment. We also acknowledge that our group is biased towards a predominately ecological humanist approach due to the nature of our education in FLFS, which strives to address global issues surrounding health and sustainable land and food systems (FLFS, 2008). In evaluating the seven guiding principles of the UBC Food Systems Project, our group agrees with the vision statement developed by the project partners (Vision Statement for a Sustainable UBC Food System 2002-2005, 2002). Goals for the LFS Garden encompass each of the guiding principles for a sustainable food system.

Research and Methodology

Collaboration with the other Scenario Five groups has proven to be instrumental for the completion of this project. In the beginning it was difficult for different groups to agree with one approach to accomplish this project and therefore, each group decided to explore individual ideas, but share information gathered from stakeholders and other resources.

The research proposal was first started by compiling a list of information already known about the project and information that would need to be gathered. To gather the necessary information interviews were conducted with faculty members of UBC who are already involved with Agora Café, the UBC Farm, and associated people. Information was gathered directly by means of in-class conversations and outside class time interviews. Insightful class conversations took place with Brenda Sawada, SEEDS manager and Mark Bomford from the UBC Farm regarding connections between the LFS garden and the UBC Farm. Personal interviews were conducted with: Art Bomke on the subject of soil sampling, nutrient content and viable crop varieties (personal communication, February 13, 2008); Lin Steedman to ask questions regarding her directed studies LFS garden paper and Agora Café's food supply needs (personal communication, March 4, 2008); Stacey Friedman of the UBC Farm's Land Learning Programs with questions involving the educational component of the LFS garden (personal communication, March 26, 2008); Gwen Chapman to address the possibilities of attaining course credits for volunteer work done at the garden (personal communication, March 5, 2008); Nick Gallant for information about how waste is managed and the composting procedures (personal communication, March 7, 2008); Jeff Nulty from UBC Plant Ops about hard landscape architecture (personal communication, March 18, 2008); Ashley Peterson, current LFS Garden Directed Studies student, relating to the LFS garden (personal communication, March 4, 2008); Pearl Yip with inquiries relating to the AgUS community dinners (personal communication,

February 13, 2008); and Chrissie Ohlund, a Wednesday Hot Lunch Coordinator for Agora Café (personal communication, February 9, 2008). Additionally, interviews were conducted via e-mail with Sophia Baker-French regarding the Agora Café's needs and functioning [REDACTED] March 3, 2008) and with Megan Halstead about information on Friends of the Farms and their role in the LFS garden project (March 5th at [REDACTED]).

West Coast Seeds Catalogue was used to search for possible crop varieties that would be suitable for the soil type and nutrient content of the garden's current soil, as well as, consulting the viable crop variety chart in Lin Steedman's paper. A variety of school garden projects/community gardens were researched to gather information about funding and management plans for operating a garden. To address the composting issue, the Greater Vancouver Region District (GVRD) proved to be a viable source of information about various composting methods and compost designs. Assessment of the garden's soil was evaluated through soil analysis with Art Bomke and information gathered from the book "Designing and Maintaining Our Edible Landscape Naturally" (Kourik, 1986).

To contribute to the faculty's vision of integrated education, educational tools and opportunities for the LFS garden were explored. Potential courses that could benefit from the use of the LFS garden were searched and a list was compiled for both courses offered by FLFS and other faculties at UBC.

Due to a lack of funding, an application for the 2008 Grad Class Council Gift was put forth, which could potentially pay for the salary of a summer garden manager. An email with a job description for a garden manager position was forwarded to all LFS students by Cathleen Nichols, community partnership manager [REDACTED]

Findings

The interviews conducted were in regards to food distribution, the long term maintenance and operation of the current and proposed expansion garden, waste management, educational opportunities and connecting the garden to the UBC Farm.

Preliminary Research

The online literature research focused on other university campus gardens, and seasonal crop production in British Columbia. Many of these campuses meet much of the criteria we would like to infuse into the LFS Garden such as; using the gardens for learning and teaching, providing accessible organic foods to the campus community, and utilizing urban agriculture to move a campus towards a more sustainable food system. One of the most notable gardens is the F.H. Student Organic Garden at the University of Wisconsin (UW). This garden provides several food outlets on the campus with produce. In addition, the garden donates a substantial amount of produce to food pantries on an annual basis (UW-Madison Center for Integrated Agricultural Systems, 2008). Several courses at UW, such as Rural Sociology and Environmental Studies use the garden for instructional purposes. Workshops are also offered throughout the year on topics such as seed starting and crop rotation (UW-Madison Center for Integrated Agricultural Systems, 2008).

Seasonal crop production in British Columbia proved to be a limiting factor in the creation of a university garden. Produce grown for campus food outlets would need to be ready to harvest through September to May of the academic year. West Coast Seeds online catalogue proved to be a valuable source of information for what can be grown in the BC climate in addition to which crops will work well in cooler climates. Vegetables and herbs that were identified that would work well with the menus of Agora Café and the AgUS community dinners include: kale, tomatoes, onions, lettuce, squash, cucumbers, carrots, basil, rosemary, thyme, mint,

sage, and lavender. One main concern with growing vegetables in BC is the short growing season. Various methods enable the extension of the growing season such as mulch use and protective (Gilkeson, 2005).

Interviews & discussions

Lin Steedman – 2007 Directed Studies: In a meeting with Lin Steedman, who worked on the development of the LFS Garden through a directed studies project in the summer of 2007, she outlined the process of starting and maintaining the garden. Much of this information was previously garnered from her study's final paper, however; personal communication led to insight and suggestions for the continuation of the project. The majority of the plants growing in the existing garden were donated by the UBC Farm and by Sudoa Farm located in Sorento, BC. Other resources, such as tools and compost, were provided by Martin Hilmer and the UBC Farm. Landscape design was previously completed by a landscape architecture class; upon completion Lin transformed the area into a food garden. Vegetables currently growing in the garden include tomatoes, lettuce, winter squash, zucchini, cucumbers and herbs (basil, sage, oregano). The produce was distributed to various members of the faculty, Lin herself, visitors, and various other members of the community. With the opening of Agora Café in September, the garden supplied basil, squash, and zucchini to the existing menu (C. Ohlund, personal communication, Feb. 10, 2008).

Information gathered from Steedman's directed study paper indicates important features of the current LFS Garden. The current garden covers an area of approximately 70 m², sloping westwards. Soil is sandy, and has a pH of 5.8. Subsequently, Steedman added 0.0056kg/m² of phosphorus, and 0.01kg/m² of potassium to the soil. Upon tilling, 7 kg of lime was added, in addition to organic fertilizer with a ratio of 1:1:2 of N:P:K; this was provided by the UBC

Farm. UBC Plant Ops provided 0.4 m³ of organic compost (Steedman, 2007). See Appendix A for complete soil analysis.

Agora & AgUS – Campus Food Providers in Macmillan: The information obtained through the interviews with Sophia Baker-French, manager of Agora Cafe, and Pearl Yip, AgUS president, were imperative in considering the future distribution of garden produce. Both expressed interest in the opportunity of sourcing herbs and vegetables from the garden.

AgUS requires produce once a week to prepare for their Wednesday night community dinners, however; they were not specific in their produce needs due to a constantly changing menu. Despite the fluctuations, weekly staples include garlic and onions. Ideally, AgUS would hope for potential produce to be harvested and delivered on Tuesday. Preference is given for fresh over frozen produce. AgUS would be willing to dispose food waste into garden compost bins. Importantly, AgUS would be willing to assign a Garden Liaison to coordinate with a garden manager on produce orders (Yip, 2008).

Agora Café is open for breakfast and lunch Monday to Friday, with one day of the week serving a hot lunch special. Not including the lunch special, Agora Café's weekly produce needs applicable to the garden are: 30-50 tomatoes, 12 cucumbers, 5 heads of lettuce to create salads and sandwiches. Furthermore, Agora Café makes three quiches per week that often include rosemary, kale and occasionally winter squash; however, the ingredients are flexible and can vary due to seasons and available ingredients (Baker-French, 2008). Agora Café's current Wednesday lunch coordinators are very pleased with the accessibility of the garden and would like continue to use garden produce as needed (Ohlund, 2008). The coordinators did express that it would be very difficult to depend on the current LFS Garden to supply all of the produce for a certain recipe, since the garden can only supply a small amount of certain products.

In autumn of 2008, Agora Café is planning on providing two hot lunch specials and making eight to ten quiches per week. The sandwiches and salads will no longer be available every day, but instead become a weekly feature. Therefore, the demand for tomatoes, cucumbers and lettuce will decrease, while increasing demand for kale, chard, squash and herbs. As lunch specials are planned prior to the beginning of the semester, there is opportunity to coordinate ahead of time with the garden for sourcing ingredients. Sophia expressed flexibility in choosing recipes, providing even more opportunity to incorporate garden produce.

Mark Bomford – UBC Farm Program Coordinator: During a presentation to the AGSC 450 students, Mark Bomford illustrated his experience with the UBC Farm in purveying vegetables for food service outlets on the UBC campus. Previous AGSC 450 classes had approached the farm with respects to providing vegetables, particularly squash for Pie R², located in the UBC Student Union Building (SUB). This opportunity was not able to be realized until the 2006/07 school year due to the lack of ability to guarantee the demand required for a consistent menu feature. The proposed Squash Pizza came to fruition as a result of intentional efforts by the UBC Farm to ensure the required volume of squash was met. This highlights the importance of knowing and ensuring one's capacity as a food provider prior to engaging and committing in contractual agreements.

One of the most important concerns expressed by Bomford and various other interviewees was that the garden be showcased as an “extension” of the UBC Farm and not as a “replacement” (Bomford, 2008; Bomke, 2008; Steedman, 2008). The UBC Farm land is currently under pressure to be developed into housing. If the garden is seen as a replacement, the future of the farm may be jeopardized. Some suggestions provided were to showcase the garden as a small-scale model of the farm, using it as a promotional tool to bring awareness and value to the UBC Farm. Further suggestions for the garden included a concentration on growing foods the farm is

unable to, for example potatoes. Bomford mentioned that the UBC Farm may be able to provide tools, fertilizer and labour.

Art Bomke – Soil Quality: Art Bomke has been a key resource for the current garden project, providing history of the expansion land use, instructions on soil assessment, and overall guidance for the creation of the expansion LFS Garden. Upon meeting with all 2008 Scenario five groups, Bomke elaborated on the history of the land, highlighting the expansion site’s original agricultural use as an apple orchard. During the 1940s, this land was developed. Eventually, mobile units were installed on the land. These buildings were removed in 2007 and the area was replaced with a “constructed soil” consisting of yard trimmings, compost and sand thus creating a “non-native” soil (A. Bomke, 2008)

During the taking of soil samples from the expansion garden, Bomke highlighted qualitative features of the land that he deemed important. The native soil, free from structure development, contained earthworms and some rocks in its soil mixture of sand, silt, clay and gravel. Sloping westwards, away from Macmillan, the depth of the non-native soil was ~35-40 cm deep at the eastern edge of the garden and ~15cm deep towards the western edge. The slope of the land caused wood particles to be washed downwards, which has resulted in sandier soil over time (Bomke, 2008).

The results of the completed soil assessment indicated the non-native soil had a neutral pH level of 7.0. Framing the non-native, the native grass-covered soil has a more acidic pH of 5.8 (Appendix A). Levels of potassium, magnesium and nitrogen are low in both the native and non native lands. Art Bomke had previously planned to have potatoes grown in this plot of land as they were a good crop to “test” the viability of the soil. The potatoes were donated by Helmer Farm (Bomke, 2008).

Brenda Sawada, Martin Hilmer, Jeff Nulty – Stewardship, Logistics & Garden Design:

Throughout our research it became apparent one of the major challenges facing this project was ensuring stewardship. Brenda Sawada emphasized the need to maintain and manage the garden throughout the year particularly in the summer months when very few students are on campus (Sawada, 2008). Martin Hilmer suggested it would be ideal if a summer job could be created or a directed studies project could be used to operate and maintain the garden throughout the summer and school year. Further stewardship suggestions included creating a garden committee comprised of faculty, students and staff.

Suggestions were made during these interviews regarding the layout and the importance of the aesthetics of the gardens. The most common suggestion was to make the garden a place where people can relax in an aesthetically pleasing environment and develop a true sense and appreciation for urban agriculture. Some of the more insistent suggestions include defining the garden using fencing or hedging. Creating a clearly defined boundary will give the garden presence and ownership (Sawada, 2008; Nulty, 2008; Hilmer, 2008).

The logistics of the expansion garden development have brought forth potential leads for resources. Hilmer has offered the use of various tools and a storage space at the back of the MacMillan building. Upon consultation with Nulty, he encouraged the use of a recto-linear (rectangular lines) perimeter to create visual impact, giving the garden definition and boundaries. Hedging, pathways and garden beds are critical in this respect. Any permanent boundary will need to allow at least six feet around the current apple trees to ensure UBC Plant Ops is able to cut the grass around the trees. Nulty suggested woodchips over processed bark mulch or crushed granite for the pathway because they are lightweight and can be packed deep to prevent weeds. Bark mulch is no longer used on the UBC campus due to chemical leeching. Crushed granite is expensive and is not as effective as woodchips in preventing weed growth (Nulty, 2008).

In addition, Hilmer and Nulty recommended contacting UBC Botanical Gardens for potential plant donations. Though initially Nulty believed UBC Plant Ops could donate hedging, further investigation proved this would unfortunately not be possible, however; Nulty did recommend approaching UBC Properties about donating lumber to construct raised garden beds.

Nick Gallant – UBC Waste Management: Compost is an essential component to a closed loop garden, recycling the nutrients back into the soil to promote healthy plant production. Nick Gallant has indicated that there is currently not enough compost for the UBC campus, therefore; UBC Waste Management will not be able to provide compost for the gardens. Gallant suggested that developing our own compost system would be the most effective methods to meet our needs. The compost would provide fertilization to the gardens in addition to opportunities for research.

Gallant advised Windrow composting systems to be an effective method of composting and may be suitable for the garden. Worm bins and black bins were deemed useless and the construction of our own compost system would be most beneficial. Upon further research of composting systems through the Greater Vancouver Regional District website, we came upon construction plans for a Home Built Rodent Resistant Three Bin Compost System. This system enables the composting of 2000 kg of organic waste, producing 700 kg of organic fertilizer every 6 months. (GVRD, 2002).

Gwen Chapman – Educational Opportunities: Various educational opportunities exist for the LFS gardens. Gwen Chapman indicated that course credits could not be offered in lieu of volunteer work on the LFS Garden project, but suggested incorporating it into pre-existing courses. Directed-study projects in addition to student directed seminars are potential means for undergraduate students to interact with the gardens in an academic setting. Bomke believes using

the garden for education and learning would be crucial to the long term growth and sustainability of the garden.

Meagan Halstead – Friends of the Farm: Steedman identified UBC AMS club, Friends of the Farm (FoF), as a resource group for the continual maintenance of the gardens. Through contacting Megan Halstead, the role of FoF has not been clarified. Though FoF had plans to administrate the garden through their club, using volunteers from AGSC 100 and Agora Café for work parties, and club members, faculty and staff for day-to-day operations, none of these actions have been realized. FoF expressed similar concerns regarding the stewardship of the garden, however; increased student involvement from AGSC 450 has blurred the lines of responsibility.

Discussion

Garden Vision: The development of productive and edible landscapes surrounding the H.R. Macmillan building provides a real and unique opportunity to showcase the many benefits of urban agriculture and sustainable food services on campus. The opportunity to provide herbs and vegetables for Agora Café and AgUS localizes these realities for the LFS community.

Garden Development - Production and Distribution: Actualizing this opportunity will take time and small steps towards understanding the needs and capabilities of both food service outlets and the gardens. Bomford's insight on meeting contractual agreements in terms of providing an agreed amount of produce highlights the need to focus on allowing the existing garden to produce small amounts of useful crops.

Due to Agora Café's menu shift towards increased quiche production, using kale, rosemary, and squash, a strong production of these crops is warranted. This focus on Agora Café is more realistic due to the consistency in the menu, a quality that the AgUS community dinners lack, however; given the future success of the expansion LFS Garden, supplying produce to

AgUS may be realized in the future. The creation of a working relationship with Agora Café, meeting their needs for certain vegetables, such as kale, is important for establishing a virtual buyer-seller relationship, bringing economic sustainability to the LFS Garden.

Produce should be acquired from the gardens as needed by Agora Cafe and AgUS to ensure the freshest possible produce. The amount of produce can be recorded in logs where upon the Café will be invoiced at a pre-determined time. This proposed system should be monitored by the Garden Coordinator to ensure the smooth execution of the system. Given the nature of the infancy of this pilot project, uncertainties need to be factored into the agreement. It is hoped that the garden can become economically sustainable through this manner and can avoid being reliant on financial grants for its operations. With respects to start up costs, grants should still be pursued by the LFS Garden Committee.

Kale, herbs and squash are three viable options for crops that can be harvested during the academic year. Kale exists in multiple varieties, including those that can be harvested well into October. Kale also grows well in a pH of 6.0 - 7.0 (Denckla, 2003). Rosemary, a good growing companion for kale, requires a soil pH of 6.0 - 7.5 (Denckla, 2003). Given the last reported pH of 5.8 in the south side lot, slight soil pH adjustment may need to occur for optimal yield for these two crops (Steedman, 2007). Another herb that may be valuable to Agora Café is basil and should continue to be grown. Although the size of squash from last year's harvest was identified as small, the inclusion of squash and other herbs into the garden does bring increased biodiversity and variety to food menus (Ohlund, personal communication, 2008). Please refer to Appendix B for production plan and harvesting schedule.

A spectrum of development possibilities exists for the expansion garden on the west side of the Macmillan building. Current advances include soil sampling, tilling and the planting of spring potatoes. The spring potatoes provide insight into the soil's quality and production

potential (Bomke, personal communication, 2008). The spring potatoes are to be harvested in late May or early June and will be donated to the UBC Farm in an attempt to establish good relations.

Education - Opportunities and Tools: The FLFS emphasizes integrated education focused on problem-based and student-centered learning (FLFS, 2008). In addition to its primary role of providing vegetables and herbs for aforementioned food service outlets, the LFS Gardens present opportunities for professors and students to utilize the space for demonstration sites and/or provide hands on learning. The FLFS offers many courses that can incorporate the garden into their curriculum (a full list of courses can be found in Appendix C). For example, the garden can be used to practice pest management applications or to demonstrate horticulture techniques. Plots could be set aside specifically for student research purposes. Furthermore, the gardens can be used to illustrate the role of urban agriculture in a local food system through visits to the sites. To inform faculty members and professors of this opportunity an email can be sent out stating the garden's vision and inviting them to use the space. In addition to academic pursuits, the LFS Gardens can be used for community education throughout the summer and fall. Programs and workshops, such as the AMS Mini-school Series, can be organized by the LFS Garden Volunteer Coordinator for people interested in learning about gardening and composting.

Various educational tools can be created for the garden. It is important that the gardens are able to provide an educational experience to all visitors and be given credibility as an established place of learning. Various tools can be used including crop identifiers and information regarding the nutritional profile of the various plants. Crop identifiers can include not only the common name of the individual plants, but also the scientific and Latin names. Each crop's place of origin can also be included. Nutritional profiles that highlight vitamin and

mineral content of each crop is another tool that can be employed to incorporate education into the LFS Gardens. These nutrition tables can be posted alongside the crop identifiers or on a poster in the MacMillan building near Agora Café. A Food, Nutrition and Health class could incorporate the LFS Gardens into its course curriculum by creating and utilizing these nutrition profiles.

Stewardship - Creating a Committee & the UBC Farm Connection: Stewardship of the garden is one of the most important components of garden establishment. The political nature of campus-land development, in addition to community value differences, necessitates the formalization of a committee. A committee will help to enable the direction of operations to flow in a smooth manner. By incorporating faculty, staff, and students in the committee, a spectrum of insight and input will be ensured. Through discussions and interviews with various stakeholders, a list of individuals was developed who would be willing to be a part of a formal committee. Please see Appendix H for the complete list of committee members.

The overall operations of the gardens should be carried out by a student representative, ideally, in a coordinator position. Pending the results of an application made to the Grad Class Council Gift Fund, in addition to funds from the UBC Farm (see Appendix D for application proposal & Appendix E for budget), paid summer and fall/winter “Farm Awesome Volunteer Coordinator” position may be established. If funding does not come through, this position will be offered on a volunteer basis. Further motivation for this position may arise through academic credit gained from a directed study, following the example of Steedman and Peterson. In addition to overseen operations of the LFS Gardens, including distribution of harvest, these liaison positions will act to create connection between the LFS Garden, Friends of the Farm, and the UBC Farm. There are concerns that as the application for the GCC fund is under the UBC Farm, not the Garden Committee, the importance of the LFS Garden will be diminished. It is hoped

that further communication and negotiation with the UBC Farm concerning the vision of how the LFS Gardens will fit into the current picture of campus food production will occur. Discussions concerning the practicalities of funding, labour, and resources for the Gardens, will prove to aid the gardens to achieve their full potential.

An identified area of concern is the future use of the land. The current permit lasts only six months. Forming the committee and illustrating stewardship as an active component of student learning and community, will aid in the pursuit of an established garden for the LFS community and create legitimacy to the space.

Waste management & Soil quality: The management of the garden waste (plant trimmings, and other organic waste) is important for the creation of a close-loop system, recycling the nutrients absorbed by crops back into the soil. Essentially, waste management of a garden is about naturally sustaining the soil quality. By achieving this, LFS Gardens can become a model for sustainable practices, encouraging other faculties and the University to act upon its discussion of sustainable practices. Food waste from Agora Café and AgUS can also be incorporated into the LFS Garden's proposed compost system, thereby increasing the potential fertility of the soil. Small compost containers can be set up in the Agora Café kitchen and eating area and emptied daily into sealed plastic garbage bins covered with sawdust or soil to control odours. Food scraps from AgUS community dinners and weeds from the garden can also be added directly to the plastic garbage bins. When enough waste has accumulated it can be added to the first compost bin.

The proposed three bin composting system will allow a greater volume of waste to be composted relative to the GVRD-supplied black bin composter. The construction of this composter is a component of the garden that should be constructed this summer with funds either from the money obtained by Steedman, or potentially from the UBC Farm. Materials to be used

can potentially be reclaimed or as in-kind donations. The future LFS Garden Volunteer Coordinator should commence this project as soon as possible (Consult GVRD Website for full compost construction plans-see references).

The complete soil assessment of the LFS expansion Garden warrants soil nutrient adjustment. Compost, a commercial fertilizer called, sol-po-mag, and lime need to be added to the soil (Bomke, personal communication, 2008). It has been mentioned that among the resources able to be garnered from the farm, compost and sol-po-mag are available. As a compost system for the garden has yet to be established, this is logically advised. With respects to dolomite lime, which raises the pH of the soil, it is uncertain if this is able to be acquired from the UBC Farm. Further investigation into this matter is required. The compost, sol-po-mag, and lime will need to be added at an approaching date, and may in fact be completed by Peterson in her current directed-studies project.

Design/Aesthetic: The vision of the current LFS Garden on the south side of the MacMillan building is to create a herb and flower garden. Current food production can be shifted over to the expansion garden, enabling the area to showcase a variety of herbs available for Agora Café, AgUS, and the UBC Farm. Wooden ladders, running parallel to the walkway can be laid down to create distinct and attractive mini-beds for herbs and flowers. Edible and non-edible (with signs to identify) flowers can also be used to create a boarder for the garden. Herbs that should be planted include rosemary, basil, oregano, parsley, cilantro, thyme, chives, mint and dill, however the garden need not be limited to just these.

With the harvesting of the spring potatoes at the end of May and beginning of June (A. Peterson, personal communication), the proposed committee will be able to move forward to establish a formal garden layout and design. A proposed layout has been provided (see Appendix F), however; the committee should formalize a design format with input from other proposed

designs, and advise Landscape Architecture, and various other community stakeholders who have expressed interest. Ideally, this should be completed in preparation for the actualizing of the garden landscape this upcoming June 2008.

The proposed garden design incorporates the creation of quadrants, providing a physical map to be developed and carried out over time. Two quadrants will focus on food production for Agora Café and AgUS, with the remaining two available for directed studies and a free-flowing ornamental landscape. The sectioning of the garden enables each quadrant to be developed as time, money, and labour allow. The first quadrant is to be developed immediately with the goal of producing vegetables for Agora Café and perhaps AgUS for the fall semester. Approximately four beds can be built parallel to MacMillan, two of which should be developed during the summer of 2008 to grow varieties of kale, chard, and varieties of lettuce, among other vegetables. The crops can be seeded in late July/early August (Gilkeson, 2005), giving a good amount of time for the building of raised beds in which they can be grown. If there is sufficient capital, the remaining two beds can also be developed during the summer of 2008. Rotating beds through a cycle of production and fallow would be a manageable plan for ensuring soil fertility. A cover crop should be planted on the bed which is being uncultivated to prevent erosion and fix nitrogen back into the soil. In addition to the beds, a pathway of woodchips has been advised (Nulty, personal communication, 2008), and could work both with and between quadrants; however, until funds are sufficient, a clover cover crop may also work. The border of the quadrant can be created out of calendula (marigolds) and nasturtiums (both edible flowers) with breaks for entrance into the quadrant. This border will give spatial distinction to the area as well as aesthetic appeal. The second quadrant can be developed similarly to the first. It has been assumed that logistics will prohibit the development of the garden to proceed beyond this first quadrant.

For the long term development of the garden, all that can be provided here is a vision. A central spherical shape, encircled with benches and perhaps a fruit tree in the centre, has been envisioned to invite people into the garden, as well as provide a gathering area for classes. With respects to the third and fourth quadrant, cover crops should be planted until there is a well developed plan for the area to move forward. Potential plans could involve directed studies, a course laboratory site, a native plant section, a berry section available for garden visitors, or other creative use of land. These ideas should involve research and envisioning from future AGSC 450 groups.

Ensuring the infrastructure of the garden – a sign, perimeter, pathway, benches, and a properly delineated composting area – is visually clear and aesthetically pleasing is vital in garnering support. These aspects of the infrastructure have been identified as a priority through consultations with Jeff Nulty (Plant Ops), Nick Gallant (Waste management) and Brenda Sawada (SEEDS).

Signage in the LFS gardens is important as it will not only help identify the space as well as contact information for persons interested in learning more about the LFS Garden and/or how they can be involved. The inclusion of a temporary sign is currently posted in the expansion garden (see Appendix -- for LFS Garden sign design), however a permanent and attractive weather proof sign needs to be installed. In addition to a sign, a perimeter with crisp lines will outline and give presence to the garden as well as act as barrier for roaming Totem Park residents. Possible materials suggested have included hedging, a cob wall, and blueberry bushes. Plant Ops have mentioned the possibility of obtaining hedging from them in the future, however this year they are unable to do so (Nulty, personal communication, 2008). The construction of pathways after the removal of the potatoes may take time. Currently the tilled soil has no path, and may

require a cover crop such as clover to settle the soil before a woodchip pathway is able to be installed.

Finally, a secure and clearly marked area for composting is important for preventing rodents and promoting the practice of composting. The area should be fenced-off and separate from the garden. The compost site has been proposed for the north side of the garden, easily accessible to Agora Café, AgUS and community members. It is critical to create a sense of permanence in both gardens if their longevity and community value is to be advocated and supported by stakeholders.

Recommendations

The following are recommendations for the LFS Garden Coordinator for summer 2008 including specific tasks to complete:

1. To ensure maintenance of the garden, a 'Garden Committee' consisting of students, faculty, staff and representatives from Agora Café and AgUS should be implemented.

Specific Tasks:

- Consult Appendix H for a list of individuals who have shown interest in participating in a formal LFS Garden committee.
 - Design job descriptions for committee members (secretary, treasurer, volunteer coordinator, etc.).
 - Committee should be organized prior to Fall semester, 2008.
2. Develop the LFS Garden education component through developing crop identifiers, nutritional profiles for crops and inviting instructors to incorporate the garden into their lessons.

Specific Tasks:

- When harvest production plan has been finalized, develop appropriate crop identifiers.

- Contact Food, Nutrition and Health faculty to propose to have FNH students develop nutritional profiles for the crops.
- Contact instructors to share the vision of the gardens and showcase the opportunities of incorporating them into their lesson plans.
- To further engage interdisciplinary education, courses in other faculties such as, biology, geography, forestry, etc. can incorporate garden learning component as part of their course syllabus.
- Contact Andrew Riseman to incorporate the garden into AGRO 490 lessons.
- Contact Art Bomke and Dr. Krzic, who co-instruct AGRO 402/SOIL 502, to incorporate the garden into their lessons.

3. Develop professional buyer-seller relationships with Agora Cafe's and AgUS liaison.

Specific Tasks:

- Contact Agora Café and AgUS liaisons' to finalize contractual agreements and to determine weekly produce needs starting autumn of 2008.
- Establish an agreed upon price and system of procurement with Agora Café and AgUS (e.g. record produce taken from garden, price either by weight or amount, and date of invoice).
- Determine harvesting date for spring potatoes and recruit volunteers (contact farm) to help with the harvest.
- Contact Mark Bomford to coordinate delivery of spring potatoes which will be sold at the UBC Farm Saturday Farmer's market.

4. Establishing the garden in the LFS community by determining a garden name, signage and designing promotional resources, such as a LFS Garden website to provide access for people to learn more about the garden (its vision, location, events dates and contact information).

Specific Tasks:

- Establish the expansion garden name as the 'Orchard Garden' in recognition of the apple orchards that use to cover the expansion land.
- Design a LFS Garden website.
- Propose to the UBC Farm to include on their website an external link to the LFS Garden website.

- Search for a professional printing company that offers a reasonable cost to print the proposed LFS Garden sign. The material needs to be able to withstand outdoor environments such as, vinyl or corrugated plastic.
5. Implement production and harvest plan for established LFS garden (south MacMillian) concentrating it on growing kale, herbs (rosemary, basil) and winter squash:

Specific Tasks:

- In May/June begin planting new crops. Refer to proposed production and harvesting plan (appendix B) for a planting kale, herbs (rosemary, basil) and winter squash.
 - Contact UBC Farm and UBC Botanical Gardens for plant donations.
6. Establish a garden design and production and harvesting schedule for the expansion garden (West MacMillian) which will be implemented once the spring potatoes have been harvested. Expansion of this garden should be implemented slowly due to limited funding and resources, and uncertainties regarding the six month lease of the land the expansion garden sits on.

Specific Tasks:

- Further research into the expansion gardens soil profile is necessary to determine what produce will grow successfully.
- Consult with AgUS and Agora Café liaison to determine their produce needs.
- Consult Art Bomke and Andrew Riseman for developing experimental/educational plots.
- Review other proposed garden designs (AGSC 450, scenario five), consult Landscape & Design (Jeff Nulty), and various other stakeholder to finalize a garden design.
- Contact UBC Farm and Bontanical Gardens for plant donations.
- Construct a composter. Consult GVRD's compost plan for a Rodent resistance Three Bin Composter.

- Research avenues for fencing in the expansion LFS Garden. This fencing should be economically feasible and aesthetically pleasing.

7. Establish connections with various stakeholders who can provide resources and consultation for the LFS Gardens. Refer to Appendix I for contact information of the following:

Specific Tasks:

- Contact Martin Hilmer in regards to providing tools and supplies as well as access to a storage area at the back of the MacMillian building.
- Contact Mark Bomford for fertilizer, tools and labour needs, if needed.
- Contact UBC Farm and Botanical gardens in regards to plant donations.
- Contact Plant Ops about sourcing woodchips for expansion garden.
- Search for companies that may be able to donate woodchips and wood for raised beds.

8. Research bursaries/awards and other opportunities to receive further funding for the garden

Specific Tasks:

- Review and revise current proposed budget (appendix D)
- Develop action plan for garden fundraising in the future.

In the case this project is incorporated in the AGSC 450, 2009 scenarios, the following are recommendations to the students:

1. Consult with stakeholders early in the planning process to establish contacts and to begin collecting resources.

Specific Tasks:

- Follow up with stakeholders involved in the 2008 scenario.
- Research current progress in urban agriculture at other campuses.
- Conduct soil assessment to re-evaluate soil health.
- Re-evaluate current production and distribution with Agora Café and AgUS.
- Consider re-applying to the Grad Class Council Gift Fund.
- Research further opportunities for donations (plants, materials, etc.).

Recommendations for the AGSC 450 teaching team:

1. A majority of the students currently in AGSC 450 will be graduating this year. Considering these AGSC 450 projects are based on implementing projects on the campus, in an attempt to establish long term stewardship for these projects, the teaching team should consider the following AGSC course curriculum revision.

- *UBC Community Food Assessment Project* should be replaced with the AGSC 450 *UBC Food Assessment Project*. If AGSC 350 students can begin their projects in their third year level Land and Food Systems class, their research and recommendations can be continued and possibly realized in fourth year. AGSC 450 can build on the 350 projects and implement recommendations from previous years.

Conclusion

Through research and an in-depth investigation into the LFS Garden and the LFS community, countless opportunities are apparent. Although the garden is not yet fully operational and many aspects still need to be implemented, support from stakeholders, faculty and students make this an optimistic project. Suggested recommendations are important guidelines for future participants in this project. To successfully bring about our vision and ideas, changes must be implemented slowly. The road to the final stage has the potential to be lengthy and challenging; however, the benefits of the garden in its completion can have lasting effects in the UBC community and can ultimately promote and advertise the vision and goals of FLFS. Ultimately, the LFS Garden has the potential to be an attractive site providing both education and produce to the surrounding community while drawing public attention to UBC's innovative movement towards a better sustainable campus among other universities in North America.

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Appendix A: Soil Analysis

Feb 18/2008

PSAI

UBC Eric Cheng
+ Art Bonki.

SAMPLE	pH	Buffered pH Determine Limit To achieve pH 6.5 (10-1000 ft ²)	Carbon-Nitrogen Ratio	Salts (mmhos/cm) E.C.	Organic Matter (%) O.M.	Total Nitrogen (%) N	AVAILABLE NUTRIENTS (ppm)													
							Phosphorus P	Potassium K	Calcium Ca	Magnesium Mg	Copper Cu	Zinc Zn	Iron Fe	Manganese Mn	Boron B	Sulfate-Sulfur S				
LFC Hander																				
NATIVE	5.8	50	17.1	0.36	10.1	0.33	49	75	700	80	3.1	12	30	23						
NON NATIVE	7.0		27.9	0.40	9.6	0.20	51	145	3000	155	3.2	13	110	67						

Appendix B: Production and Harvesting Plan

Production Plan & Harvesting

- Roughly 30 cuttings from different varieties (Tuscan Red, Red Russian, Winterbor, Redbor) are to be acquired from the UBC, permission for this needs to be formalized.
- Cuttings need to be transplanted, potentially indoors, until the plant has matured enough to be planted outside.
- Cuttings of rosemary and other potential herbs need to be sourced from the UBC Farm or elsewhere.
- Squash seeds need to be purchased and/or donated.
- Start squash from seed 71 – 81 days before FFD for summer squash, and 111-141 days before FFD for winter squash (Denckla, 2003).

- Work parties need to be formed and a date set for the coming months.
- Herbs are able to be harvested and frozen or dried to preserve the herbs after they are ready.

Box 1.1 – Kale Starting Dates

First Seed-Starting Date

Germinate +	Transplant +	Days before LFD* =	Count back from LFD
3 – 10 days +	35 – 70 days +	14 – 28 days =	52 – 108 days

*LFD = last frost date

Last Seed-Starting Date

Germinate +	Transplant +	Maturity +	SD* Factor =	Days back from FFD*
3 – 10 days +	21 days +	56 – 63 days +	14 days =	94 – 108 days

*SD = Short Day factor (less sunlight during the days)

**FFD = First Frost Date

Source: (Denckla, 2003)

Box 1.2 Production - Harvest - Distribution Chart

Plant variety	Transplant	Plant in ground	Harvest	Distribution
Tuscan Red Red Russian Winterbor Redbor	June	July/August	September - October	Agora
Rosemary	May / June	June	September - October	Agora / AgUS
Squash		June	September - October	Agora
Other herbs	May / June		September - October	

Appendix C: Possible UBC Courses with Potential Garden Use

Faculty	Course	Course Title	
LFS	AGSC 100	<i>Introduction to Land, Food and Community</i>	
	AGSC 250	<i>Land, Food and Community I</i>	
	AGSC 350	<i>Land, Food and Community II</i>	
	AGSC 450	<i>Land, Food and Community III</i>	
	AGSC 490	<i>Topics in Agricultural Sciences</i>	
	AGRO 322	<i>Horticultural Techniques</i>	
	AGRO 324	<i>Plant Physiology I</i>	
	AGRO 326	<i>Introductory Plant Pathology</i>	
	AGRO 328	<i>Weed Science</i>	
	AGRO 340	<i>Soil Chemistry and Environmental Quality</i>	
	AGRO 341	<i>Soil Physical Properties and Behaviour</i>	
	AGRO 342	<i>Soil Biology</i>	
	AGRO 361	<i>Key Indicators of Agroecosystem Sustainability</i>	
	AGRO 401	<i>Soil Processes</i>	
	AGRO 402	<i>Sustainable Soil Management</i>	
	AGRO 403	<i>Field and Laboratory Methods in Soil Science</i>	
	AGRO 421	<i>Integrated Crop Management</i>	
	AGRO 423	<i>Ecophysiology and Horticulture</i>	
	AGRO 440	<i>Pedology</i>	
	AGRO 497	<i>Directed Studies</i>	
	FRE 302	<i>Small Business Management in Agri-food Industries</i>	
	SOIL 200	<i>Introduction to Soil Science</i>	
	SOIL 501	<i>Soil Processes</i>	
	SOIL 502	<i>Advanced Sustainable Soil Management</i>	
	SOIL 503	<i>Advanced Field and Laboratory Methods in Soil Science</i>	
	Science	BIOL 140/141	<i>Laboratory Investigations in Life Science</i>
		BIOL 209	<i>Non-Vascular Plants</i>
		BIOL 210	<i>Vascular Plants</i>
		BIOL 317	<i>Weed Science</i>
		BIOL 324	<i>Introduction to Seed Plant Taxonomy</i>
BIOL 343		<i>Plants and People</i>	
BIOL 351		<i>Plant Physiology I</i>	
BIOL 407		<i>Plant Ecology II</i>	
BIOL 433		<i>Plant Genetics</i>	
BIOL 443		<i>Plant Breeding and Biotechnology</i>	
Arts	GEOG 204	<i>Forest and Agricultural Climatology</i>	
	GEOG 309	<i>Physical Geography Field Course</i>	
	GEOG 350	<i>Introduction to Urban Geography</i>	
Forestry	FRST 311	<i>Plant Physiology I</i>	
	FRST 310	<i>Soil Biology</i>	

Appendix D: Grad Class Gift Proposal

Project Name: Farm Awesome: Urban Agriculture for Social and Ecological Justice

Context: Building upon the UBC Farm’s student-initiated emergence as a key part of a sustainable campus food system, a group of students have worked over the last year to create a new space outside the Macmillan building: The Land and Food Systems Orchard Garden. The goal of the garden is to provide a site for hands-on learning about small-scale urban agriculture in addition to supplying local produce and support for other student initiatives such as Agora Eats, the AgUS-run Wednesday night community dinners, and the UBC Farm. The LFS Orchard Garden creates a link between small-scale urban gardening and the production-scale agriculture led by students at the UBC Farm.

“Farm Awesome” is an exciting initiative that mobilizes student leaders to link the vision of the Orchard Garden into a sustainable campus food system, and spreads the academic and community benefits of locally-produced food throughout UBC.

Benefits: Many UBC students can benefit from “Farm Awesome,” using both the Orchard Garden and the South Campus Farm as a resources to research biological, social, environmental, urban planning, and economic dimensions of sustainable food systems. Such research produces a more dynamic learning environment for the University. These urban agricultural initiatives provide an ideal model for food security, connecting people with their food sources and demonstrating the connection between city and farm by linking the main campus Orchard Garden and the south campus UBC Farm.

Criteria

Creative – “Farm Awesome” enables creativity on many levels. Landscape design, developing seasonal food knowledge and skills, and working on small-scale food production technology, enables students to engage in outside-the-box thinking, creative problem solving and direct contact with the models they are working on.

Social Justice – Food is a basic human right. In order to uphold this right over the long term, society must ensure that it has a sustainable, productive, food-producing base, and that all people can access healthy, affordable, and culturally appropriate food. “Farm Awesome” engages students by challenging them to consider and participate in their food system in new ways, linking the importance of a sustainable production system with a holistic view of a socially just society.

Supporting Sustainability – Our food system is a major contributor to greenhouse gas emissions. There are immense opportunities to explore alternative, local production systems that mitigate the effects of climate change. “Farm Awesome” explores these climate-friendly production alternatives, visibly sharing their products through campus, and making the links between food and global ecological sustainability.

Supporting Volunteer Programs on Campus – A GCC gift would provide the “Farm Awesome” initiative with a volunteer coordinator to mobilize student and community volunteers throughout the year. With exciting new and highly accessible volunteer opportunities in the Orchard Garden linked with support for the south campus UBC Farm and the Friends of the Farm club, we anticipate at least 3,500 hours of new, meaningful, and rewarding volunteer work for the UBC community.

Appendix E: LSF Garden Proposed Budget

Start up & maintenance costs for summer 2008

Equipment

Shovels (3)	\$60.00 (3 @ \$20.00)
Rake (2)	\$50.00 (2 @ \$25.00)

Hoe (2)	\$40.00 (2 @ \$20.00)	
Irrigation Supplies		
2 - 100 ft. Garden hoses @ \$40.00 ea.	\$80.00	
4 - rotating sprinklers @ \$30.00 ea.	\$120.00	
Buckets (5 gallon)	\$14.00 (2 @ \$7.00)	
Pitch fork	\$30.00	
Wheelbarrow	<u>\$45.00</u>	
TOTAL		\$439.00

Landscaping

Raised bed perimeter	\$300.00	
Wood-chip pathway	<u>\$300.00</u>	
TOTAL		\$600.00

Compost (based on construction plans from GVRD three bin composter)

Wood (Rough cedar)	\$195.00	
Hardware	\$25.00	
Wire Mesh	<u>\$60.00</u>	
TOTAL		\$280.00

Signage

Plant identification signs	\$50.00	
Garden entrance (vinyl & print)	<u>\$50.00</u>	
TOTAL		\$100.00

Manager Salary

\$15.00/hr @ 10 hr/week @ 16 weeks		\$2,400.00
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Seeds & plants*

\$600.00

Fertilizer*

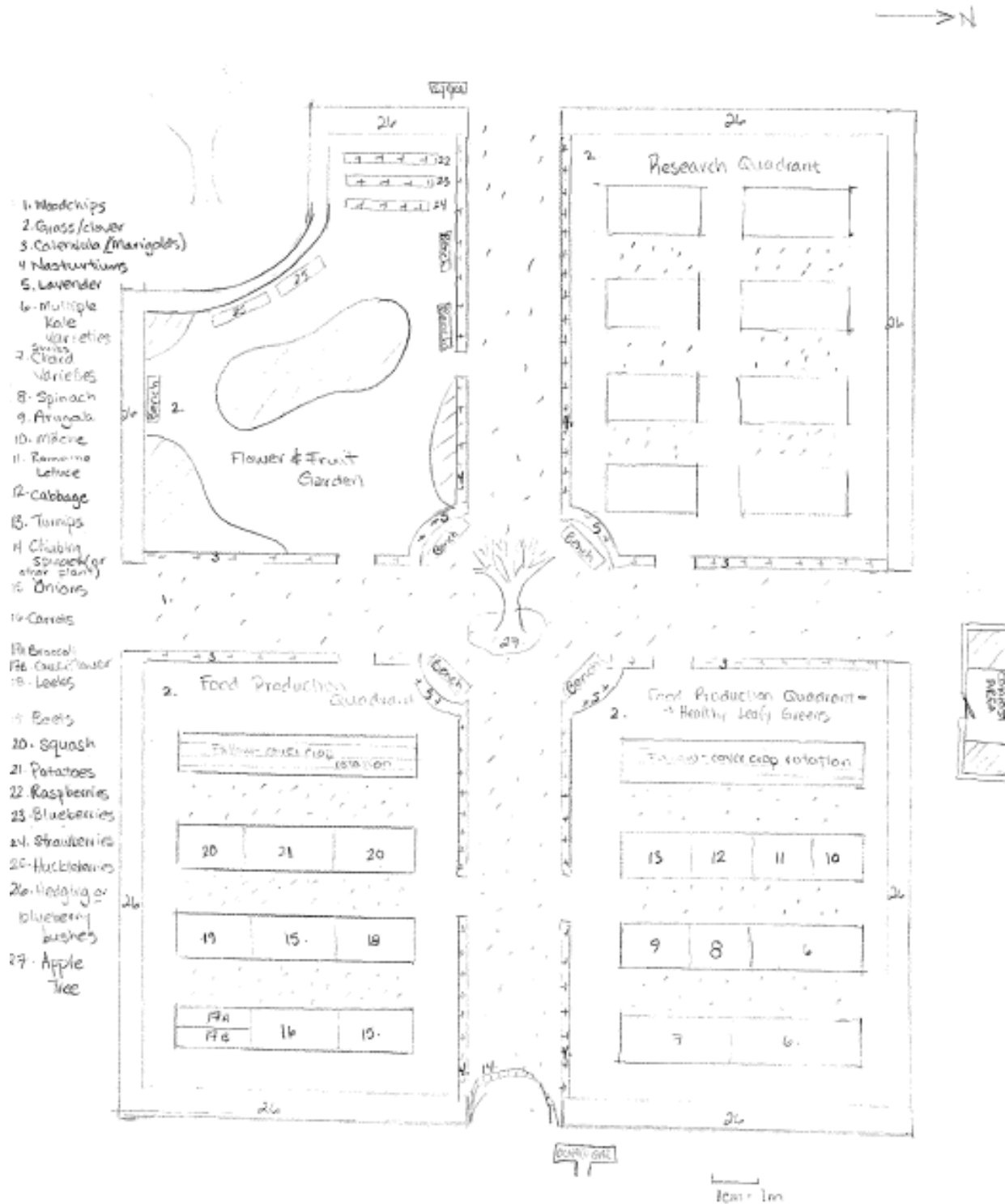
\$100.00

TOTAL COSTS

\$4,519.00

*These prices can only be approximated. Gifts and donations cannot be forecasted.

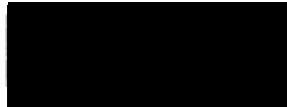
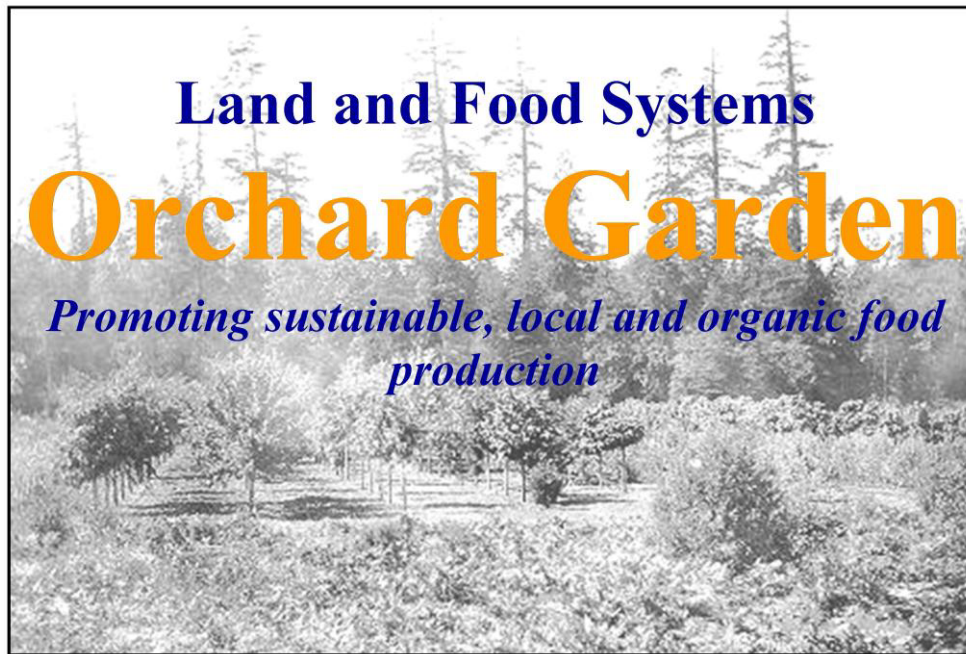
Appendix F: Proposed Garden Layout



Appendix G: Proposed Garden Sign

In an attempt to acknowledge the origins of the garden and the landscape of the original agricultural land, the Orchard Garden sign includes a photograph (UBC Historical Photographs) of the original UBC Orchard. Existing trees from the orchard can also be labelled to provide faculty, staff and students with historical information about the area.

Permission to publish this sign with the current photograph will need permission from University of British Columbia Archives [REDACTED]



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Appendix H: Interested Committee Members

