

The Orchard Garden Expanding the LFS Garden

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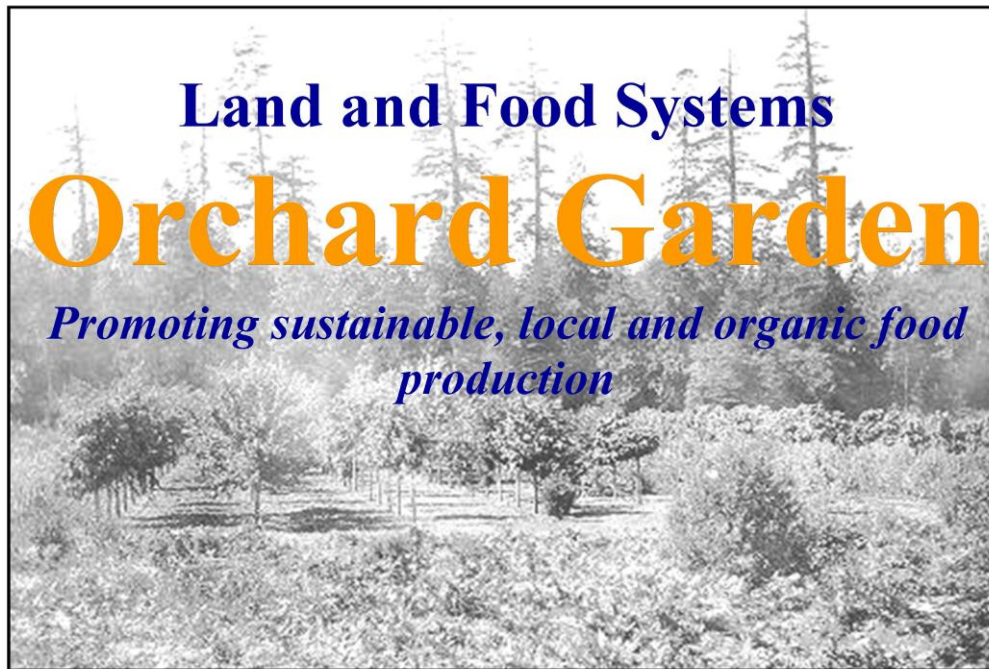
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UBC Food System Project

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The Orchard Garden

Expanding the LFS Garden



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Faculty of Land and Food Systems
Grounded in Science | Global in Scope

Group 7: Scenario 5

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I. Abstract

The goal of the University Of British Columbia Food System Project (UBCFSP) is to create a sustainable UBC food system with the collaboration of multiple partners as well as the involvement of students from AGSC 450. For our scenario, our targets are to create a garden using sustainable practices to be used as a model for urban Agriculture and a space for learning as well as to provide food that can be used in the LFS community. In order to create a greater sense of awareness of LFS values, we worked in partners with UBC Farm, Agora Café, AgUS, Friends of the Farm and Faculty of Land and Food Systems to create a connection between the LFS faculty and the greater UBC community.

During the planning process, our group has reviewed some literatures and websites on community gardens to obtain more background information on developing the LFS garden. This led us to understand the steps and reasons for garden expansion. In order to create a production and distribution plan, we went about interviewing and emailing ones that know well about the types and amount of crops that Agora and AgUS want as produce. We have also created a harvesting plan and layout with the help of faculty members as well as professionals. In addition to interviews, we also met up with we visited Stewardship of the garden is very important. We achieved this by setting up a committee that comprise of faculty, staff and students to oversee the maintenance, financial management and enhancement of the garden. In particular, a manger position is created to control the operations as well as to report to the committee. In order to make use of the garden for educational opportunities, we made a list of possible courses and contacted professors who would be interested in incorporating the garden into their curriculum. We prepared a budget list for start-up costs associated with plant materials, tools, and the pathway and finally, have made some recommendations for the future of the garden.

II. Introduction

The University of British Columbia Food System Project (UBCFSP) is a collaborative, community-based action research project that seeks to harmonize the diverse visions of campus sustainability maintained by various stakeholders. Through the implemented projects and initiatives, the UBCFSP seeks to demonstrate practical and successful opportunities for sustainable and secure food systems and to provide a comprehensive model that can be extended to other institutions. This project exists as a continuation of the research and recommendations made by previous student-groups and stakeholders and builds upon the foundation these groups have constructed (Rojas, Richer, & Wagner, 2007). The specific purpose of this project is to augment sustainability efforts in the UBC food system and to recognize obstacles that hinder the UBC food system from making the transition towards food sustainability (Rojas et al., 2007).

III. Problem Definition

Our group was assigned to Scenario 5, which involves the integration of the LFS garden into the Faculty of Land and Food Systems. This project entails assessing the opportunities to showcase the urban initiatives that would increase regional food security and sovereignty. With the encroachment and conversion of agricultural land into commercial and residential development and our burgeoning population, local means of agricultural production have been compromised. This generates food security vulnerabilities due to our growing dependency on foreign food systems. In order to alleviate these pressures, food security and sovereignty movements have enacted policies that conserve and maintain

ecologically sensitive agricultural land in the rural periphery. Furthermore, these movements have recently turned their attention towards urban areas and are focusing on opportunities to bring food production inwards to the city centre. Here, new opportunities for food security have emerged with a significant interest in *urban agricultural production* - a food security initiative that demonstrates the intricacies that link production and consumption through its level of scale.

As such, urban agriculture/gardens play an integral role in the greater issue of food security and clarifies the urban/rural dependencies by exemplifying food production on a level people can understand - i.e. raising awareness. Furthermore, one of the most important and effective characteristics of urban agriculture is that the opportunities - the gardens - it creates are accessible to everyone. Urban agriculture raises the food security of a community by directly increasing the nutritional status, mental health, and social and physical qualities of urban environments (Bellows & Brown, 2005). Essentially, urban agriculture initiatives and the gardens they create bring a variety of benefits to communities through the social, nutritional, and educational opportunities they provide.

In spite of the fact that The University of British Columbia is a leading educational institution and directly proposes that it is at the forefront of sustainability, there are no urban agricultural garden models here on campus. We believe that it is important to rectify this inadequacy and to reconnect the campus community with its food system by bringing urban agriculture into and onto our campus. Several universities in North America have developed gardens to supply learning, teaching and research opportunities; to increase their biodiversity by creating green spaces; and to contribute to campus nutrition by providing fresh foods to on-campus facilities (Sustainable Endowments Institute, 2007). These successes should direct and motivate UBC to do the same.

At UBC, there is a garden existing outside the south entrance of the Faculty of Land and Food Systems Macmillan building. The garden covers an area of approximately 70 m² where some vegetables were planted in 2007 (Steedman, 2007). Our goal is to expand this garden to be able to supply organically produced food for the LFS community to use, as well as to provide educational resource for teaching and learning among our faculty, staff and students and, lastly, to increase awareness of food security and sustainability.

IV. Vision Statement and Values Assumption

We believe that the UBCFSP vision statement clearly encompasses the values and the vision that we have for the development of the garden. We want the garden to create a connection between the LFS faculty and the

greater UBC community, in order to create a greater sense of awareness of the values and vision of a sustainable campus. Our value assumptions through this project are based on our shared weak anthropocentric paradigm derived from our experience in the series of Land, Food and Community courses over the past 3 years. We adopt a more holistic paradigm, encompassing ecological and social sustainability, as well as providing economic sustainability to our buyers, such as Agora and AgUS. These values affect our outlook on this entire project. For example, we believe by expanding the LFS garden, we are providing easier access to fresh, local, nutritious food to students, either directly or by way of Agora and AgUS meal planning. Furthermore, the ecological impact of the provision of fresh, local foods is evident as we are reducing food miles and consequentially, the environmental degradation generated through transnational and unnecessary transportation networks. As we are focused on sustainability, we are also trying to make the garden a closed-loop system. Another value assumption that is core to our group's methodology is the basis of community-based action research (CBAR). CBAR focuses on social, structural, and physical environmental aspects through active involvement of community members, organizational representatives, and researchers in all aspects of the research process. Partners contribute their expertise to enhance understanding of a given phenomenon and to integrate the knowledge gained with action to benefit the community involved (Israel, Schulz, Parker, & Becker, 1998). We believe this is the best way to conduct research on this type of a project.

V. Methodology

A. Literature Review

Before beginning this project and making plans, the first thing our group did was review the research paper written by Lin Steedman as a directed studies project based on the creation of an LFS Garden (2007). The concept of the LFS garden was initiated by Lin to increase awareness about local food production and consumption on the UBC campus. This directed studies research paper was an important first step for our group to gain the background knowledge needed for planning this garden and its expansion.

Another imperative elementary step for taking on this project was to conduct background research on other community and campus gardens to learn what is being done and how they are successful. We looked into some other universities, such as University of California: Santa Cruz, to find out what has worked when they implemented campus gardens. We

also researched UBC prospectus on the UBC Farm and urban agriculture. To understand the true purpose of this project, we looked in to an article pertaining to benefits of urban agriculture.

B. Interviews

After researching other community gardens we set about looking into who would be interested in the garden expansion. We wanted to know who would use the garden, both for the produce it would produce and for the educational aspect the garden could provide, and who would maintain the garden. We also wanted to get input as to the best way to set up the garden, what produce should be planted to make it usable, how the crops should be rotated throughout the year, what we should do with the waste from the garden and how the garden was going to be maintained throughout the year.

In order to get this information we went about interviewing and emailing individuals that we felt would give us the best information possible. This was done through collaborations with other groups also working on Scenario 5, so as to not be too repetitive with the people we were interviewing. First we wanted to know what crops should be planted in the garden. For this we emailed and interviewed Sophia Baker-French who is the general manager of Agora Café in the McMillan building. Because Agora would be the main beneficiary of the produce the garden produced, we wanted to know what produce they use, how much they use per week and how much they spend on produce. We also contacted and interviewed Pearl Yip, the president of the Agricultural Sciences Undergraduate Student Society (AgUS), to see what produce they could possibly use at the Wednesday night barbecues that they put on every week.

After getting a sense of the types and amounts of produce people wanted the garden to grow we moved on to find out about how to lay out the garden. For this we interviewed Jeff Nulty who is a landscape designer that works for the UBC Plant Operations (Plant Ops). He was able to give us an idea of how the garden should be laid out and what the University regulations are on certain aspects of campus planting. Martin Hilmer, a LFS staff member, also provided extensive information and ideas on how to manage and cultivate a successful garden. Furthermore, we emailed Megan Halstead, the secretary of Friends of the Farm, to get information on how they maintained the current garden last year, what supplies they would need to maintain the garden and if they would be interested in helping in the maintenance of the new garden once it is planted. Lastly, we were in constant contact with Professor Art Bomke who guided us throughout the process of assessing and constructing a framework for the LFS Orchard Garden.

C. Elections for Committee Members

The plan for this garden is to be student run, however we decided we needed to create a committee that consisted of both students, faculty and UBC staff in order to make the garden run more smoothly. Although there were many candidates that were suitable for a role on the LFS Garden Committee, not all had the interest or time to become involved with this project. During our research into the feasibility of implementation of the garden, various people from faculty, plant operations, and students were asked about their interest in becoming a member of the Orchard Garden Committee. The people we choose to ask had prior experience in growing plants and had close ties to faculty and operations so that they could benefit from the garden in the future. Although, through collaboration with other Scenario 5 groups, we were able to contact the majority of the people that would have been ideal to join the garden committee, there were some individuals that we were unable to contact due to unavailability or time contrasts. Once we began to discuss the goals and purpose of the garden to those that we were able to come into contact with, mixed feelings were shown between the people we interviewed. It was due to the work involved from the members which needed to be integrated into their currently busy working schedule that make the deal less appealing. There were a few people who were interested in working with the garden despite the effort required by committee members. These people are listed in the findings section.

D. Creating Manager Position

The process of creating the managerial position involved all members in all of the Scenario 5 groups as well as some faculty members. Brenda Sawada (personal communication, March 2008) gave us some advice regarding the importance of stewardship as well as constraints that include money, time and holidays. Art Bomke and Mark Bomford (personal communications, March 2008) also gave us some insight into recommendations on the characteristics of a potential manager. In addition to the professional advice, suggestions were collected at the prospective garden during our group meetings with all the members in this scenario. We then organized the ideas and created a job posting. The draft was posted in the discussion board for everyone to edit. Lastly, the final copy (refer to Appendix ?) was sent out to students in the Land and Food Systems with the assistance of Cathleen Nichols.

E. Creating Educational Opportunities and Tools

One of the goals for this garden is provide educational opportunities for students, faculty and staff. We want to incorporate the garden as a learning component to provide an opportunity to apply what is learned in the classroom. We researched and chose a list of academic programs within the Faculty of Land and Food Systems that we felt would have an interest in incorporating the garden into their curriculum. Under these academic programs, we have come up with a list of courses that we feel is appropriate to incorporate the garden into. Because there are a lot of courses available, we limited our choices down to courses that currently have laboratory activities. When deciding which courses to integrate, we looked into the objectives of the courses of our interest. After we came up with our final list of courses, we sent our emails to all the instructors who would be interested in participating. The list of courses that we thought should incorporate the garden, as well as the email we sent to instructors is included in Appendix ?.

We also wanted to create some educational tools that would go into the garden. In order to create one specific signage for the garden, all Scenario 5 groups gathered together to come up with the name and design for the signage. In order to make the sign, we tried to salvage scraps of woods that we could use. One of the groups has graphically designed the background of the signage on computer. The signage also has contact information, as well as the vision and goals of the garden. We also felt that the garden needed signage that would tell us what each plant was and give us some nutritional information about that particular plant. For this we felt that a Food, Nutrition and Health class could be involved and create signage through a course activity (The garden sign design template is located in Appendix ?.

F. Budget

Before trying to determine the cost the garden would incur we first had to decide what type of garden we will be creating. We agreed that a community garden was very similar to our plan, since the size and layout of a community garden is very similar to the LFS garden. As well, like a community garden, we decided that the LFS garden will have separate beds and pathways. However the LFS garden will not have a fence, instead we decided to use berry bushes, for aesthetic reasons. We found a website created by a non-profit organization called Urban Harvest that was useful in our research.

Urban Harvest also described the tools needed to maintain a garden, however only a few tools were mentioned. Through our discussion with Mark Bomford, manager of the UBC Farm, we were able to find out additional information

on the materials needed to keep a garden. In order to find the cost of the given utensil we used the Canadian Tire website because they have the cheapest products.

In order to determine our budget we first needed to find the initial cost associated with building a garden. We first searched for any type of source that will relate to the type of garden we are making. We found a website (What is this website called) which explained the methods and cost of building a community garden. The 4 Scenario 5 groups also discussed the garden budget with Art Bomke, Pearl Yip (manager of AGUS), Sophia Baker-French (manager of Agora), Lin Steedman, and Mark Bomford (manager of UBC Farm). They were able to help us determine the crops we needed to grow, the supplies we needed, and the price we should sell the crops at. We mainly focused on Lin's paper to determine the crops that we wanted to grow. Due to the constant costs that arise when managing the garden it is important to generate some profit to keep the garden running. We determined that asking for a price for produce would be appropriate. In order to set a fair price for the crops we viewed the UBC farm prices.

Last year Lin Steedman applied for a grant so that the garden she created will be able to remain and grow after her project was over. Due to her application we had a starting budget of \$500. Although this was a great contribution we did not feel that \$500 was sufficient for building a garden which was planned to keep for the years to come. Following in Lin's footsteps the Scenario 5 groups decided that we should apply for the 2008 Graduation Gift. The 2008 Grad Gift is a grant provided from the Grad Class Council (GCC) given to the program they and the graduating class decide needs it most. The GCC has \$25,000 to give and they give up to \$12,000 to a single program. In order to get a large grant the groups decided to apply under the UBC farm, this would help the garden be associated with the farm and as well provide extra money for the farm. Because the grant was made for the farm, we worked with Mark Bomford to come up with a budget for the proposal.

G. Compost Research

Finally we realized that an important part of the garden expansion is finding a sustainable way to manage its waste. We wanted to know more about what to do with the waste from the garden and the waste Agora and AGUS produced from garden products. For this we interviewed Nick Gallant who works for UBC Waste Management. He was able to give us some information on UBC's current organic waste system and about small scale composting. We also were able to go on a tour of UBC's compost facility located on South campus. While the information gathered from out

interview and the tour were very useful and interesting they didn't quite meet our needs as far as small scale composting. Nick Gallant suggested that we check out the Greater Vancouver Regional District (GVRD) in order to get more information on backyard composting.

VI. Findings

A. Literature Review

i. Lin Steedman (2007) Directed Studies

Through Lin Steedman's directed studies project she acted on the plans designed by students in Landscape Architecture for a courtyard area and food garden next to the MacMillan building (Steedman, 2007). Steedman (2007) first evaluated the garden site by determining the micro-climate and the health of the soil, as well as the effect of the surrounding trees and inherent slope on water availability and shade. A soil sample was sent for analysis to a commercial laboratory (Pacific Soils Analysis Inc., Richmond, B.C) and it was determined that the soil plot needed organic matter and lime to increase the pH (Steedman, 2007). Steedman (2007) proceeded to build the garden plot by tilling the soil and adding compost and lime. The organic matter of the soil was increased by planting white clover and creeping root alfalfa as a cover crop (Steedman, 2007). Steedman (2007) planted a few food plants, such as zucchini, lettuce, and herbs, and developed a three-year crop rotation schedule.

Along with the crop rotation schedule for the garden, Steedman (2007) left behind eight important recommendations. The first was to establish a closed-loop system where the garden waste goes into the compost and the compost goes back to the garden to fertilize it. The second recommendation was to form a student group as the Friends of the Farm are currently overseeing finances and maintenance. A student group who will be responsible for supporting, continuing maintenance and overseeing finances of the garden is needed. The next recommendation was to expand the garden and incorporate it into the university education system by involving students from all disciplines in the Faculty of Land and Food Systems (LFS). The fourth recommendation was to create signs for the garden such that the campus community is informed of the visions and goals for the edible garden. The fifth and very important recommendation was to emphasize that the garden is an extension of the UBC Farm, acting as a "pronounced demonstration," and not intended to replace it (Steedman, 2007). This should encourage more people to visit the farm. The sixth recommendation is to research on building a pathway using sustainable material so that people can access the

garden easily, making it more inviting. The seventh recommendation was to conduct additional soil tests to determine if the compost and cover crop indeed improve soil quality. And lastly, Steedman (2007) suggests investigating campus gardens on other universities to get ideas (Steedman, 2007). She mentioned that the UC Santa Cruz is an example of a successful campus farm and garden extension (Steedman, 2007).

ii. Health Benefits of Urban Agriculture

In an article by Bellows, Brown & Smit (2005), we learned about the importance of urban agriculture on the impact of the mental and physical health of individuals and communities. Bellows et al. (2005) states that if people have more experience with growing food, then it is more likely that they will consume it, leading to a positive impact on health. Gaining practical experience with fresh food positively impacts dietary habits because people become more knowledgeable. Vegetable consumption is higher amongst people who grow them, leading to increased intake of nutritious foods allowing people to meet their required vitamin and mineral needs. Freshly picked vegetables have approx 30-50% more nutrients than vegetables that have been transported for 5-10 days. Gardening also supports practical nutrition education as well as providing a higher level of food security (Bellows, Brown & Smit, 2005).

It was also determined that urban agriculture supports community health on many levels. Gardening supports healthy active lifestyles, as the physical activity can be good exercise. Additionally, it is good for mental health as gardening tends to be a relaxing activity (Bellows et al., 2005). Urban agriculture in schools provide for non-traditional learning labs for students, where they become familiar with healthy foods that are typically missing from their diets. It provides a strong linkage between nutrition, education, and learned behaviors (Bellows et al., 2005). Community gardens contribute green environments for an urban area, which is typically missing, leading to improved air quality and increased biodiversity. They also contribute to creating safe communities as it brings people together as gardens tend to link different sectors of a city—youth, elders, and diverse race, ethnic, and socioeconomic groups (Bellows et al., 2005). After reading this paper it gave us a better understanding of the reasoning behind this garden expansion project.

iii. Other Universities

While we did research on gardens implemented on other university campuses, we decided not to include the information in this report. This is because the information that we did find was not very relevant to the garden we are trying to create. We looked into the garden implemented at UCSC and also the garden implemented at Evergreen State

University in Washington. While there was some information on the UCSC garden and farm, it did not really give us any insight into what we should do for our garden due to our dramatically different climates. For Evergreen State University we were unable to find any information on the internet so we contacted the garden manager through email. We thought we would be able to get information on a garden in an area similar to our climate, however the people from Evergreen State were uncooperative and the email went unanswered. Therefore, we decided to use the information gathered from Lin Steedman's directed studies report and also information on the UBC farm.

iv. Re-inventing the UBC Farm: Urban Agriculture and Forestry

The goals of the LFS garden are similar to those of the UBC Farm. However, it is extremely important to note that the Garden is not intended to replace the UBC Farm, but to act as an extension of it instead, serving the purpose of enhancement of campus landscapes, which is a goal of the UBC Farm (UBC Agricultural Sciences, 2000). The goals of the UBC Farm are divided into three categories: education, research, and extension. The educational goals of the farm are to provide opportunities for experiential learning and research, to involve students in enterprise management experience, to pursue opportunities to evoke regional botanical knowledge by working with First Nations and other ethnic groups, and to demonstrate and practice sustainable land management methods (UBC Agricultural Sciences, 2000).

Research goals comprised of generally exploring the various ecological, nutritional, socio-economic, environmental and policy-related dimensions of agriculture, forestry and alternative food systems (UBC Agricultural Sciences, 2000). Extension goals of the UBC farm are several. The primary goal is to be able to serve as a demonstration of urban agriculture. The farm is also serving the purpose of increasing biodiversity on the farm, producing food sold at the farm market and various UBC campus food outlets, and serving as a site for collaboration and exchange with other research institutions in Canada and internationally (UBC Agricultural Sciences, 2000).

UBC Agricultural Sciences (2000) go on to describe the "MacMillan Precept" as a component of the UBC Farm. They elaborate on the goal of redesigning the MacMillan Building landscape to act as a "storefront" for the UBC Farm and to offer an immediate landscape for more practical, applied teaching and learning experience for both faculty and students (UBC Agricultural Sciences, 2000). A few of the intend projects of this farm extension in MacMillan include the development of a demonstration or community garden to be used by faculty, students, researchers, the UBC Food Co-op, and residents of Thunderbird Residences, as well as to assess and restore the old UBC orchard to augment on-

site production of fruit and nuts. The proposed design would be within the management framework of UBC Plant Operations (UBC Agricultural Sciences, 2000).

B. Interviews

From our interviews we were able to gather a lot of useful information to be used in the planning of the new garden. Through our interviews with Agora and AgUS, we found that they would like to see tomatoes, cucumbers, lettuce, kale, chard, winter squash, peppers, red onions, peas, corn, zucchini, garlic, sprouts, avocados, various berries and apples in the garden (Sophia Baker-French and Pearl Yip, Personal Communication, February 2008). They also would use herbs such as parsley, rosemary, sage, thyme, and cilantro (Sophia Baker-French and Pearl Yip, Personal Communication, February 2008). We also found that both AgUS and Agora would be interested in being involved in the garden expansion and would also be able to give their organic waste to any compost system that the garden would have (Sophia Baker-French and Pearl Yip, Personal Communication, February 2008).

From our interview with Plant Ops' Jeff Nulty (personal communication, March 2008) we were told that we should involve campus community planning in the garden expansion. The garden should have clear definitions and boundaries and fruit bushes could be used for fencing (Jeff Nulty, personal communication, March 2008). Jeff (personal communication, March 2008) also told us that bark mulch is not used on campus because studies have indicated that it leaches into the soil, so an alternative would be to use wood chips to create pathways in the garden. We should also leave at least a 6 foot perimeter around the outside of the garden and around trees to leave room for a lawn mower (Jeff Nulty, personal communication, March 2008). Jeff also suggested talking to CUPE 116, the trades union, because they are another community stakeholder and he also would be willing to be involved in the garden expansion, especially on the subject of garden design (personal communication, March 2008).

Friends of the Farm were another useful resource with regards to the garden expansion. From the email communication with them we found that they were involved with the original garden and they gave us a good indication of the problems they had with the garden last year (Megan Halstead, personal communication, March 2008). They told us that there should be some tools and a sprinkler that Lin bought and received by donation last year (Friends of the Farm, personal communication, March 2008). There is also concern from Friends of the Farm that the garden may take the focus of the UBC farm in the eyes of the UBC administration (Personal communication, March 2008).

C. Committee Foundation

In the most idealistic scenario, the committee would be founded by permanent members consisting of members from Faculty, Plant Operations, and also student run positions. However, only a few positions were able to be filled at this point in time. Art Bomke (personal communication, Feb 12, 2008), an LFS faculty member, has agreed to work with the Orchard Garden from its creation and coordinate with students with the garden process. With his extended experience at UBC as well as expertise as a Land and Foods professor, Art would be an invaluable asset to the garden. Another Faculty member that was interviewed that expressed interest in future development of the garden would be Martin Hilmer (personal communication, March 10, 2008). Working within the Land and Food Systems faculty, Martin has a wealth of knowledge in terms of working with gardens and sustainability of such projects. Although there are other faculty members who posed interest in the garden project, these two people would satisfy the proposed faculty member listings.

From Plant Operations at UBC, Jeff Nulty agreed to work with the garden in the future in terms of being a part of the committee (personal communication, March 18, 2008). Working as the Landscape Designer of Plant Operations, Jeff would have the necessary connections as well as knowledge to play a crucial role in the survival of the Orchard garden. Although it was originally proposed to have two members from Plant Operations to seat in the committee, we are still looking for another member to fill the particular spot.

Christina Ohlund a student that is also part of Scenario 5 is currently part of Agora (Christina Ohlund, personal communication, March 2008). In terms of next year, Christina however would be graduating and would suggest confirming with a new coordinator with Agora. Unfortunately, since Agriculture Undergraduate Society is consistently changing, we were unable to get a stable commitment from a member so as to work as a contact with the garden. However, since new elections occur every year, it would be crucial to bring awareness to the next election to gain some commitment from AgUS.

The final member of the committee would consist of the Orchard Garden Manager which would be rehired each year.

D. Job Posting for Manager Position

After collaborating with all Scenario 5 groups, the final copy of the job posting consisted of a job description, general duties, and requirements. Due to limited funding, we have stated that the manager position will be a volunteer arrangement and that the duration will continue throughout the year. The job description begins by defining ourselves as

the students from the AGSC 450 class who are planning to expand the LFS Community Garden and the goal is to create a garden using sustainable practices to be used as a model for urban Agriculture and a space for learning & research. The overview describes the responsibilities of the manager position and states that these are to maintain and manage the development of the garden. Also, an important characteristic of the managerial position is that it is necessary to be able to work as a team. In order to attract more volunteers, the manager will also have to communicate with the Garden Committee to facilitate the incorporation of Garden work and projects into a Directed Studies program. A detailed description of the duties are listed as follows: assist in scheduling of and the supervision of volunteers; participate in at least one meeting per-month with Orchard Garden Committee members; provide progress reports; maintain the garden and support the sustainability of the garden; and organize food distribution, delivery, and budgeting. The ideal candidate to perform the managerial position must fulfill the following requirements: background knowledge in farming techniques, enthusiastic in agriculture, excellent interpersonal and team building skills, excellent time management skills, able to work independently and strong commitment. At last, reasonable working hours are stated as 10 hours/week for garden work and 4-5 hours/month for committee meeting.

Although the current manager position would be on a volunteer basis, we did work with Mark Bomford on the grad gift in the hopes of getting the funding to create a paid manager position who would be hired by the farm and would act as a link between the farm and the LFS garden. If this grad gift money comes through, we believe that this would create a greater incentive for a student to want to manage the garden.

E. Creating Educational Opportunities and Tools

We are very fortunate to have Dr. Krzic and Dr. Bomke's interest in incorporating the new LFS Garden into their courses, AGRO 402 and SOIL 502, which currently focuses on the UBC Farm and urban soil management. Dr. Riseman, who is currently teaching Applied Agroecology, Plant Breeding and Biotechnology, and Plant Science has also expressed interest in participating and he would like to know if there would be any organizational meetings.

We have chosen the name "LFS Orchard Garden" for the garden because the area where the garden is used to be an apple orchard. Our vision and goal is: "Promoting sustainable, local and organic food production". On the signage, we have put LFS garden manager email address that we created as contact information, as well as the UBC logo and

the UBC farm logo. The graphical imaging for the garden sign was created by another group also doing scenario 5.

(Graphical imaging of the sign can be found in Appendix ?)

F. Budget

The urban harvest website (2008) was very beneficial to our project. By giving us the cost of building a bed and pathway, we were able to neglect unnecessary material (Urban Harvest, 2008). For example, concrete blocks cost approximately one dollar for each block and since a bed is just used to create separation between the plants we felt concrete blocks are not needed.

We also found that fencing could be very expensive depending on the type of materials that are used (UH, 2008). Fencing can be beneficial since it provides a barrier from many animals, however we felt that there was another way to go about this (UH, 2008). Along with the cost of building a fence, we felt that a fence would repel people away and make them think that the garden is off limits.

We found that in order to maintain a garden you must have the following tools; long handled spade, garden fork, rake, hoe, pruning shears, loppers, saws, shovels, hoses and wheelbarrows. The following table describes the cost of the essential tools needed for the garden:

Table F.1

Item	Cost
Long Handled Shovel	\$14.99
Long Handled Pitch Fork	\$29.99
Garden hoe	\$19.99
Bow Rake	\$29.99
Lopper/Pruner Set	\$13.99
Hand Back Saw	\$16.99
50 ft hose	\$14.99
6 cu. Ft. Wheelbarrow	\$49.99
Total	190.92

In order to set a price for the crops we felt that we should use the price set of the UBC farm. The following table has the price of crops set by the farm. However, one of the garden's main principles is to exist as a non-profit project, so the prices are strictly used to maintain an idea of the scope of the Garden's 'business' and to construct a budget.

Generally, the produce the garden grows will either be given to the farm to sell or given to Agora and AgUS in exchange for their continued coordination in maintaining the Orchard Garden.

Table F.2

Broccoli	lb	\$0.75	\$3.00	\$2.90
Grapes	lb	\$3.50	\$4.00	\$3.75
Carrots, dragon	lb	\$1.25	\$1.25	\$1.25
Strawberries	pint	\$3.00	\$4.00	\$3.91
Raspberries	Each	\$0.53	\$4.00	\$2.84
Tomatoes	lb	\$1.50	\$3.75	\$2.75
Beans	lb	\$2.00	\$9.00	\$2.58
Zucchini	lb	\$1.75	\$3.00	\$2.13
Cabbage	lb			\$1.71
Radishes	bunch	\$1.00	\$1.50	\$1.44
Spinach	lb	\$0.00	\$7.00	\$4.94
Carrots	bunch	\$1.50	\$2.50	\$2.07
Cucumber, English	Each	\$1.25	\$3.00	\$2.37
Garlic	lb	\$0.83	\$10.00	\$6.97
Kale	bunch	\$1.20	\$3.00	\$1.50
Leeks	bunch	\$2.00	\$2.50	\$2.34
Lettuce	lb	\$1.00	\$6.00	\$5.31
Mushrooms	lb	\$3.50	\$4.51	\$4.40
Onions	lb	\$2.00	\$2.50	\$2.49
Pac Choi	Each	\$0.30	\$2.00	\$1.44
Rhubarb	bunch	\$1.50	\$2.50	\$2.06
Rosemary	bunch	\$1.00	\$2.00	\$1.08
Sage	bunch	\$1.00	\$2.00	\$1.33
Swiss chard	bunch	\$1.25	\$2.00	\$1.83
Winter squash	lb	\$0.95	\$1.50	\$1.17
Zucchini	lb	\$1.75	\$3.00	\$2.13

In order to apply for the Grad gift a budget had to be formulated. The budget included the wages of the summer and winter coordinator, outreach materials, tools, equipment, and administration. The total budget for this project is \$17,600, however only \$9,000 was asked for since the UBC farm would provide \$6,150 and \$2,450 is provided through generous donations from the public.

G. Compost Findings

Through the interview with Nick Gallant from Waste Management we gathered some useful information on composting. UBC has its own composting facility that started in 2004 and is run out of South Campus (Nick Gallant, personal communication, March 6, 2008). Waste management does not have enough compost to supply all of the soft landscaping done on campus so they will not be able to accommodate the garden (personal communication, March 6,

2008). They also do not have a license to sell the compost, so if the facility does expand, which they are hoping to do, they will not be able to sell to the garden (Nick Gallant, personal communication, March 6, 2008). The garden should be able to have their own composting system as long as there are no bad odors or gas produced from it (Nick Gallant, personal communication, March 6, 2008). Nick also told us that the best composting for our needs would be Windrow composting, which means that it is turned with a pitchfork by hand (personal communication, March 6, 2008). While the garden tour that Nick took us on was very interesting, it is not the type of system that fits the needs of the garden, so we decided not to include it in this paper.

Since our area of interest was more toward backyard composting we looked into the GVRD website and found information that would suit our needs. We found that the best way to compost was to have a layering system by starting with a base layer using straw, leaves or woody brush to promote air circulation (Metro Vancouver, 2007). Then the bin should have alternate layers of green, nitrogen-rich material, such as organic waste, followed by a brown, carbon-rich layer, such as leaves, newsprint and dry grass clippings (MV, 2007). The bin contents should be mixed every 1 to 2 weeks and the moisture level of the bin should be kept to that of a "wrung-out dishrag" (MV, 2007). Rodents and rain can be kept out of the compost bin by building it to include a lid on the bin and not putting dairy products, meat, fish or bones in the compost (MV, 2007). The GVRD also has construction plans on their website to show the best way to make a backyard compost bin (Greater Vancouver Regional District, 2002) (See Appendix ? for link to construction plans for a 3-bin rodent resistant backyard compost system).

Through information received from Mark Bomford, we would be able to use the compost from the UBC farm, we would just have to find a way to transport it from the farm to the garden (personal communication, March 12, 2008)

VII. Discussion

A. Committee Founding

In order to sustain the Orchard Garden throughout the years, a foundation is required to support the garden. This foundation is essentially in charge of finding suitable resources in order to sustain the growing operation involved with the Orchard Garden. What is unique about the Orchard Garden is that the students who maintain the garden will eventually graduate and move on to bigger things in life leaving the garden in any state. This poses a challenge for the creation of a Garden in which there is a consistent change in the labour and operations of the garden. A solution to this ordeal is

creating a board of committees who scout the required people to work with the garden in order to sustain its practices. In researching about this committee, it was important to include people with the required skills and knowledge about growing and sustainability of a garden. Furthermore these people/position need to remain unaffected by graduating classes and remain on campus even after the year. Finally, a level of genuine interest is needed from these people on the committee so that an expected level of involvement is maintained with members of the group.

Considering the criteria outlined above, the positions will have to be generated from people directly involved with UBC operations and not merely students. Two positions that will definitely be required to join with the committee would be "Agora management" and "Agriculture Undergrad Society." Since Agora will be directly using the products generated by the garden, a senior staff member will be needed to cooperate with the Garden to coordinate an effort. The Agriculture Undergrad Society (AgUS) is a direct link to the students and will be a fundamental key to getting involvement from students from the faculty of Land and Food systems. These two positions although consistently changing, will be filled by a student each year and will have a direct impact sustaining the garden. Faculty members are ideal candidates in joining the committee of the Orchard Garden. Not only will the faculty staff be present at UBC for their duration of career, faculty will have a direct influence over students whom may have an interest in communal gardens. Finally a person in Plantation Operations would a great asset to have on the committee. Not only does Plant Operations have a great deal of resources in terms of maintenance of the UBC landscape, the staff in Plant Operations can assist with basic maintenance of the garden. Both Faculty member and Plant Operations members will be difficult to recruit due to the amount of work they are already involved with, however, they are essential for full functionality of the committee.

Ideally, the more people we have involved with the garden, the greater chance of success we will have in terms of sustainability of the garden. However, all these people are from different organization around UBC and may or may not have the full commitment as a single person working with the garden. This is why a final position should be created to manage the Garden. This manager position would coordinate with the different committee members to get their input as well as directly be in charge of operations at the garden. This position would be similar to AgUS or Agora whereby it will be by volunteer basis for students or people interested from the community.

Essentially the Orchard Garden committee will consist of a person each from AgUS and Agora, two Faculty members, two Plant Operations members, and the Manager of Orchard Garden. Currently, most of these positions have

been filled and a degree of commitment with the people confirmed for those positions. However there are still seats left in the committee, one from Plant Operations, one from AgUS, and finally the Orchard Garden Manager. These obvious limitations would hurt the development of the garden especially with the lack of a managing position. Further effort should be oriented into forming a solid committee that will help the garden both in the background and in the foreground.

B. Recruiting Volunteers and Manager

In order to maintain the stewardship of the Orchard Garden, a team of the best players are needed. This definitely includes a manager who is excellent at supervising and running the garden. We have sent out an email regarding the position of manager to students in LFS who may be interested, however, we have not heard from any candidates yet. This may be due to some limitations that induce barriers for recruitment. For instance, summer is the time when many people are out of town, which makes it difficult to recruit volunteers, thus, the manager may have to work extra hours. On the other hand, a paid position for manager may be an incentive for students to work in the garden during the summer, however, we are unlikely to do so due to limited funding. Besides limitation, students from our faculty who do not have their own gardens may have the interest in helping out in the Orchard Garden.

C. Creating Educational Tools

For the garden, we also want to have specific signage to identify the crops as well as to provide nutritional information. However, we would like to propose additional education opportunities for high school students as well as students who are studying nutrition by inviting them into our new LFS Garden to help us create signage for the crops. These signs could identify what the crop is as well as list any nutritional information and benefit that come from eating these foods. The garden could be a prospect of applying what is learned from the classroom as well as possible hands-on experience from the farm to reconnect the students with the land and food systems.

D. Budget

A large amount of the costs in the first year are fixed costs. For instance, once we purchase tools we can use them for the years to come. The only major reoccurring cost that will remain is the wages for the manager. In order to provided the budget that is needed to pay the wages we have concluded many methods of generating income, which are listed in the following list:

- Grad Gift application and the UBC Sustainability Environment Center application

- A form of payment from Agora and AgUS
- A portion of class fees for any class using the garden are asked to go to the garden

We suggest that once the manager is appointed he/she should apply for the Grad Gift and the UBC Student Environment Center fund every year. The budget for this proposal involves the participation the council as well as the UBC farm since the application will be made under their name. By using the UBC farm crop prices as a guideline we are able form prices that can be asked from Agora and AgUS. Another option is to work with Agora and AgUS and work out a payment system in which they provide any profit that they receive, however this requires more extensive planning that, under the time constraints, could not be considered.

E. Composting

For the garden, we feel that the best option for compost would be to either create our own composting bin or to get the compost from the UBC farm. While they are both great options, they both have their drawbacks too. Getting the garden compost from the farm would mean that we would have to find a way to transport it from the farm to the garden. This would require a pick-up truck that we do not have at our disposal; however, we could try to work out a deal with UBC Plant Ops. where they would transport the compost for us in one of their vehicles. If we were to build the garden its own compost system, this would require money for materials, a place to put it and a person to take care of it. We would also have to worry about keeping out rain and rodents and the possibility of a bad odor coming from the compost bin. We believe that the best way for the garden to get compost would be to work out a deal with Plant Ops and get the compost from the UBC farm.

F. Production in the Orchard Garden

The actual cultivation of the Orchard Garden is a complex undertaking and must consider the involvement of numerous stakeholders, their specific interests, and their unique visions of the garden itself. The culmination of the Garden Plan is a result of the information and expectations we acquired through our findings. Before we could establish a definitive plan for the Garden, we had to account for its multiples uses: as a centre for participatory education, social activity, and food production. The Orchard Garden itself has been designed to meet four principles that reflect this diversity of expectations and realize its potential as a model of urban agriculture: 1) aesthetic appeal; 2) educational opportunity; 3) agriculturally productive; and 4) participatory.

The aesthetic appeal of the Orchard Garden relates to the following priorities in that the garden must be orderly and attractive while showcasing the effectiveness of urban food production. Organization and aesthetic clarity is equally important for production and education, and garners legitimacy in the eyes of the university. Clearly, this principle influences how we manage the garden and may be the most difficult and most important priority to maintain.

The garden, as a model of urban agriculture, should have educational value. Beyond providing educational opportunities for university courses, there are numerous simple, small educational projects that can demonstrate the value of the Garden and provide outreach activities. These activities should be primarily visual and promote participation by students, faculty, and community members. Some examples of educational projects include (Stacy Friedman, Personal Communication, March 2008):

1. A phenology calendar.
2. Themed plots – such as a butterfly garden or pizza garden.
3. A display case for that month's 'theme' - various seeds, insects, etc.
4. A plant catalog list of what's in the Garden.
5. A recipe book that uses only garden goods.
6. Work/learn days for volunteers.
7. Signs that identify plants and/or describe what's going on in specific beds, plots, rows, etc.

Educational opportunities are extensive and they require separate outreach mechanisms and management resources. This component of the Orchard Garden will be easier completed with effective and successful cultivation and management. As such, initial focus will be on achieving and establishing a manageable production strategy.

The following section covers the intricacies of cultivation in the Orchard Garden and follows a logical order that will describe the site, the soil, and the overall production plan. As a preliminary note, organic guidelines and principles underline all production strategies and activities within the garden.

i. Site Assessment

The Orchard Garden is located to the south-west side of the McMillan building and is bordered by two parking lots and the Natural Resources Conservation hut/portable, thus, putting it in a prime position for full-sun access. The garden site sits on a gradual slope to the south-west that defines water availability and movement characteristics for

the site. As of now, it is unknown what effects cultivation will have and to what extent the lowest point in the Garden may become inundated due to water flow. Beds should be placed perpendicular to the slope to discourage erosion and slow water movement. The Garden is roughly 395 m² in area and follows a recto-linear shape that shows clear ownership and presence (Jeff Nulty, Personal Communication, March 2008). Three corners of the Garden are marked by old UBC Orchard trees (two apple and one cherry) that give the Garden its namesake. A minimum 6ft wide berth has been left to accommodate the trees drip-line and to prevent competition. Presently, the trees are included in the garden plan, even though Plant Ops would like to retain their 'maintenance' responsibilities (Jeff Nulty, Personal Communication, March 2008).

ii. Soil Assessment

The biophysical characteristics of the soil were analyzed through initial observations and tested soil samples. The periphery of the site is made of primarily native soil covered by a layer of sod. The physical properties of the soil were made up of sand and silt with a gravelly, ferrous B-horizon varying between 10 and 15 cms deep. The interior of the site was noticeably bare and the soil was darker and contained bit more humus in comparison – non-native soil. However, the overall texture remained sandy and the B-horizon could be found at a deeper level at the top of the slope (up to 35 cms) and almost immediately at the bottom of the slope, with a gradient between the two extremes. Soil samples were taken and the resultant tests demonstrated a difference in mineral/chemical and nutrient composition between the native and non-native soils (see Appendix E). The differences can be attributed to the unique site history with the interior of the site having been amended with a mixture of sand and UBC compost after the portables were removed.

The chemical properties of the soil were determined by various soil samples taken on the site and sent to Pacific Soil Analysis Inc. (PSAI) in Richmond. From the soil test results and a discussion with Professor Bomke, we determined that an ideal amendment to increase soil fertility would be to augment the concentrations of sulfur, potassium, and magnesium (Art Bomke, Personal Communication, March 2008). This was accomplished by applying an organic fertilizer/mineral called langbeinite that is sold as sul-po-mag with a ratio of 0-0-22 (nitrogen-phosphorus-potassium). There were two applications of the sul-po-mag broadcast at a rate of 100 kg/ha.

Furthermore, the pH of the native soil was considerably acidic at 5.8 and PSAI recommended that we apply dolomite lime at a rate of 1lb/1000sqft to achieve an ideal pH of 6.5 (PSAI, 2008). However, this could produce scabbing problems amongst the early-potatoes we planted. As such, the lime was not applied, though it should be considered for future application –after harvesting the potatoes – in areas where blueberry bushes are not planned on being planted. Lastly, the nitrogen composition was also determined to be low and we are recommending that a fish emulsion fertilizer be applied either through a foliar spray (UBC farm technique) or diluted and applied through irrigation (PSAI, 2008 and Art Bomke, Personal Communication, March 2008).

iii. The Orchard Garden Plan

The Current Situation:

The Orchard Garden was plowed, fertilized with sul-po-mag, and then tilled in on April 2. It is currently planted through with two varieties of early potatoes – Cal-white and Pontiac – that were donated by the Helmer Farm in Pemberton. The potatoes may be harvested in early June and they will be given to the UBC Farm this summer to be sold at their Saturday Markets. Potatoes were planted because the UBC Farm’s soil ecology includes a high number of wire worm pests that could severely damage any potato crop. As such, they could not provide their market customers with potatoes and the garden has the potential to fill that gap. The potatoes will also provide a good indication of any soil fertility problems that may exist in the Garden. Furthermore, the potato planting has catalyzed/initiated the development of the Garden while allowing for future production flexibility; thus, the potato planting can be aligned perfectly with a cultivation strategy that emphasizes late-season production.

The Future:

The Orchard Garden will be separated into six plots oriented around a central rectangular space (See Appendix F). Each plot will have a specific use or theme. Plot A, B, and C will be used to cultivate crops for Agora, AgUS, the UBC Farm, and other on-campus food facilities. Plot D located in the middle of the garden will be a theme garden that seeks to demonstrate perma- and poly-culture production techniques. The bottom two plots of the garden (plots E and F) will be cover-cropped to conserve resources and to delegate time and work to be focused on the development of the four other sections of the Garden. This last section will allow for much needed flexibility and responds to the impermanency of the planning process. The selection of plots for production is flexible and may need to be resituated depending on soil quality.

Plots A, B, and C:

The designated on-campus food production quadrants will be divided into a system of raised beds that will be managed to account for a crop rotation system (plant family characteristics determine nutrient use). The beds in sections A, B and C will be three feet wide and have path ways one-and-half feet wide. This spacing optimizes growing area and respects the limitations of human reach. The main pathways that bisect the three sections will be two feet wide to accommodate greater foot traffic. The number of rows per bed is dependent on the vegetables grown, however, two to three rows is recommended. The raised beds will be built from 2 x 8 wood planks pegged in vertically to keep the garden organized and the soil level homogenous, to designate growing spaces, and to increase soil temp (talk to UBC Properties about donating lumber for building raised beds in garden). Planting/cultivation should proceed even if the lumber cannot be provided to contain the raised bed system as this is not a critical factor and can be completed once the resources are available. Plots A and B will have five beds, and plot C will have seven beds.

A general plot rotation strategy will designate a minimum of one bed left as fallow and cover-cropped with a combination clover, vetch, and rye/winter wheat (the UBC Farm system) to restore and maintain the soil ecology. Pathways could be cover-cropped as well with a combination of clover and alfalfa to further support the Garden's soil ecology; allowing for the bed and pathway location to be inverted as a long-term rotational strategy (Steedman, 2007). The pathways could also be mulched with donated bark-mulch or fallen leaves collected from UBC's annual street cleaning. However, the effect this will have on the soil is unknown and may create a barrier to longer-term management. As such, any mulch should be examined and selected for its capabilities to help build soil mass and structure.

Planting specifications – timing, depth, spacing, transplants or directly-seeded – within each bed will vary depending on the crop/cultivar. Crops will be selected according to the needs of the on-campus groups the Garden will be providing – such as Agora. Furthermore, the framework of the garden – and therefore crop selection – will determinably focus on late-season production and over-wintering strategies. We highly recommend Linda A. Gilekson's book *Year-Around Harvest: Winter Gardening on the Coast* as an incredibly strong resource that describes ideal crops and planting dates for winter production. This years planting will begin as soon as the potatoes are harvested and the basic Garden structure can be created. Furthermore, the planting plan should reflect future crop rotation strategies and

should acknowledge the vulnerabilities to disease and pests and nutrient demands crop families have. Please refer to Appendix D for a complete list of crops and a three-year crop rotation plan.

The Central Space:

This central area will serve as the social space for the Orchard Garden and will provide room for groups to convene. The dimensions of this social centre are ten feet wide by thirty-five feet long and will have three, freestanding apple trees planted with a minimum spacing of ten-fifteen feet from each other. Cultivar variety as well as all other aspects of production should refer to the UBC Farm or the UBC Botanical Gardens for support and information.

Plot D:

Plot D will be a free-form garden that models poly- and perma-culture production strategies. This plot will help maintain garden biodiversity and help introduce new cultivation styles and crops without compromising the food procurement potential of the garden as a whole. Furthermore, the increased diversity and variety of plants will attract pollinators and wildlife necessary to complete the ecological system. Also, this plot can serve as a space for those crops that may not meet the non-summer production requirements (such as tomatoes, cucumbers, zucchini, etc); or are simply valuable for their educational value (such as grain varieties). Ideally, this plot will showcase native varieties and also provide a home plot for flowers and perennials. Some recommended plants include wild strawberries, huckleberry bushes, artichokes, asparagus, rhubarb, perennial herbs, walking onions, sunflowers, Jerusalem artichokes, nasturtiums, mint, borage, and numerous flowers that could be selected for services they provide (companion plants, pest control, herbal use, etc). The plan for this plot has yet to be established.

Lin's Garden:

The Garden originally designed and cultivated by a former student exists as a periphery from the main Garden and creates a problem of continuity and resource diversion. Since the original plot is considerably smaller, integrating it into production plans presents a problem. As such, we suggest that the original Garden be transformed into a low-input herb garden to conserve resources and energies for production on the main site.

VIII. Recommendations

A. For Future AGSC 450 Students

- *Increase funding for the garden so that more people can involve* -- Future AGSC 450 students should apply for grants and the 2009 Grad gift should also be applied for again to create more funds for the garden. They can also raise the money on their own by doing fundraisers.

- *Create a greater link between the garden and Agora* -- Since Agora is going to be the major beneficiaries from the Orchard Garden, we believe that Agora, and the garden manager, should be the main caretakers of the garden.

B. For the Future Orchard Garden Committee

- *Establishing members for the Orchard Garden committee* --This is an obvious first step for the garden committee. It is important that the committee is established for a unified management team and to make any future, long-term decisions. We recommend that the committee consists of one person from UBC Plant Operations, one or two members from AgUS, a key faculty member and a key LFS staff member, a directed studies student. and a hired, committed garden manager that will guarantee success with the garden. This task may seem trivial, but in order to find someone with the commitment and knowledge about gardening is a difficult task on its own. The person needs to be available for years to come to ensure the survival of the garden.

- *Create and reinforce educational links to the garden*--The garden manager or next directed studies student should follow up educational opportunities by organizing instructors that are interested in using the garden for the classroom via the emails sent previously. This would create more awareness of the garden and an opportunity for students to apply the knowledge learned in the classroom to the garden. Demonstrating greater educational need for the garden will also help ensure its survival.

- *Incorporate the garden into the curriculum of AGSC 100* -- If the garden is included in the AGSC 100 curriculum, first year students will gain an insight into one of the core values of the faculty, which is sustainable food systems. The students should be required to volunteer in the garden for a certain amount of time. This way the garden will benefit by having helping hands to manage it, and the students will benefit by obtaining volunteer credit and obtaining the opportunity to connect with their food.

- *Incorporate the garden into courses outside of the LFS Faculty* -- The garden manager should also look into other classes outside of the LFS faculty that would be interested in including the garden into their curriculum. By doing this the

LFS faculty could increase the awareness of their values of sustainability throughout the campus, helping create increased knowledge and, eventually, a more sustainable university campus.

- *Obtain a \$1 fee from students in courses that choose to incorporate the garden into the curriculum* --This fee would help pay for expenses of maintaining and regenerating the LFS Orchard garden.

- *Establish and maintain a relationship with Campus Community Planning* -- Because we only have a 6 month lease on the current garden land the garden committee needs to work with campus planning in order to keep the garden from being destroyed.

C. For the AGSC 450 Teaching team

- *To have this type of a project in third year, or hold the AGSC 450 class in the fall term* -- Since most of this course is made up of fourth year students, it is logical to assume that most of us would be graduating in the summer. If this project was designed for the third year students, or was held in the fall term, then students working on this project can see the results of labour.

- *Set aside a portion of the "photocopy fee" collected from each student towards the LFS orchard garden or similar funding* -- This year it was noticed that not very many photocopied hand-outs were given to students in AGSC 450. However, with 192 students and a fee of \$5 each, the revenue collected was \$960. One of the areas of concern for this project was obtaining funding. If even half of the fees were donated for garden maintenance and stewardship, then it would help the garden management committee greatly.

IX. Conclusion

As of this point, the Orchard Garden is in its initial stages with its first test crop of potatoes planted. Various signs and make-shift fencing has been setup to prevent illegal actions from damaging the crops. A basic structure of the committee has been made with a degree of commitment founded from each member. There is yet to have a Garden Manager in which responsibility for the aesthetics, as well as the functional being of the garden can be put forth, however, there are high hopes for the coming year for someone to step up and take on the role. A basic landscaping plan has been written so that it suits the numerous visions of the Orchard Garden. Furthermore, a crop rotation plan has been put forth so that sustainable practices can ensure the livelihood of the garden as well as maintenance of soil fertility. A crop rotation cycle proposal has been proposed that will ensure the fertility of the soil as well as produce sufficient produce for

usage. Guidelines for next year have also been set and hopefully within the next season an organizational structure can be placed so that the garden would be self-sustaining. All in all, the Orchard garden has set its foundations and has potential to be one of the most important offerings that UBC can provide students. It will provide Agora with necessary produce in which operations can remain efficient. It will provide academic hands-on experience for students that are interested in plant growth/maintenance. Although there are vulnerabilities in terms of the garden sustainability from both a business and physical aspect, it is up to the upcoming years of AGSC 450 students, the Garden Manager, and the Orchard Garden Committee to ensure the longevity of this project.

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XI. Appendices

A. Appendix A: Job Posting for Garden Manager Position

Job Title: Garden Manager

Timing of job: Summer * Possible Fall-Winter

Position type: Volunteer

Job location: Orchard Garden – McMillan Building

Job description: Students from the AGSC 450 class are planning to expand the LFS Community Garden. The goal is to create a garden using sustainable practices to be used as a model for urban Agriculture and a space for learning & research. The job will be managing the development of the garden and maintaining an aesthetically pleasing environment. This is a team operation, so it is not entirely up to the manager to control all garden operations. There is a network of resources available to you via the Garden committee. This work could be incorporated into a Directed Studies program.

General duties:

- Assist in scheduling and supervision of volunteers
- Participate in at least one meeting per month with Orchard Garden Committee members as well as providing progress reports
- Maintain the garden and upkeep of land
- Support sustainability of the garden
- Organize food distribution and delivery
- Budgeting

Job Requirements:

- Background knowledge in farming techniques
- Enthusiastic in agriculture
- Excellent interpersonal and team building skills
- Excellent time management skills, able to work independently
- Strong commitment

Work as needed; Garden work: 10 hours/week

Attend committee meetings: approximately 4 – 5 hours/month

B. Appendix B: Email to the Professors

Dear Land & Food Systems Faculty Members,

We are students from the 2008 AGSC 450 class striving to create a plan for the expansion of the LFS Community Garden located on the South side of the MacMillan building. Our vision for this garden is to create a social space with an opportunity to reduce carbon emissions by offering food to a local food outlet (Agora and AgUS Wednesday BBQs), as well as incorporating a learning component to provide a prospect of applying what is learned in the classroom. The LFS community garden will also allow student to reconnect with the food system.

We would like to present you with the opportunity to use this garden to incorporate into your course curriculum. For example, the garden could provide hands-on experience in pest management applications, or horticultural techniques could be explored using the garden as an example. The garden can also be used for simple field trip purposes illustrating to students the relationship between agriculture and food on the table. If you are interested in incorporating the garden into a classroom project or component, please feel free to email [REDACTED]

The planning of this garden is still in its early phases and any input or feedback that you may have will be greatly appreciated.

Sincerely,

2008 AGSC 450 LFS Garden Planners

C. Appendix C: Possible Classes to Incorporate Garden into

SOIL 200 Introduction to Soil Science

Physical, chemical and biological properties of soils; soil formation, classification, use and conservation. There are no prerequisites for this course, but background in Biology 12, Chemistry 12, and Physics 12 (or first-year university-level) is strongly advised.

Term 2, with 2 hr laboratory

Instructor: Maja Krzic

They can analyze the type of soil that we have in the garden and estimate what sort of plants it could thrive in it based on its properties based on its physicochemical properties.

FNH 325/326 Food Science Laboratory I

Integrated laboratory introducing techniques used in food processing and analysis. Enrolment restricted to Food Science students.

Terms 1/2, 3 hr laboratory

Instructor: Christine Scaman

Maybe they can compare certain nutritional components of some garden vegetables to conventional market vegetables. Also, maybe they can use the orchard apples for the Apple Leather lab—but we'd have to guarantee it for them.

AGRO 322 Horticultural Techniques

An introduction to horticultural practice in an experiential learning format. Plant identification, seeding, propagation, pruning, cultivation media, pesticide application and safety are examined in the context of integrated crop management. An additional fee may be required for the pesticide certification examination.

Term 2, with 3 hr laboratory

Instructor: Douglas Justice

They can practice their techniques on the garden. Maybe part of their course credit could be to put some man hours into the garden.

AGRO 328 Weed Science

Importance, identification, dissemination and biology of weeds; preventive, cultural, biological and chemical methods of control.

Term 1, with 2/3 hour laboratory

Instructor: Mahesh Upadhyaya

They can get reports on the soil quality and analyze best weed control methods for the garden without using Pesticides. They can present a report on the garden weed management as a project.

AGRO 402 Sustainable Soil Management

Application of fundamental, unifying, soil science principles in sustainable ecosystem management.

Term 2, with 2 hr tutorial

Instructors: Art Bomke, Maja Krzic

They can analyze ways to make the garden more ecologically and biologically sustainable.

AGRO 361- Key Indicators of Agroecosystem Sustainability (mandatory)

This course builds on the foundation of agroecosystems in AGRO 260 and AGRO 360, and the key indicators of sustainability in the faculty core (AGSC 350) with a detailed exploration of biophysical, economic and social ecosystem sustainability indicators for primary production subsystems.

Instructor: Bomke

Question: What is a “web-oriented course”?

Comment: Student can apply what they have learned regarding sustainability onto the garden.

AGRO 360 mandatory has three hour lab

Animals and Plants as Components of Agricultural Ecosystems. This second course in the agroecology core uses a systems approach to investigate the functions and interactions of plants and animals in agricultural systems. A fee will be assessed each student to cover field trip costs.

Instructor: Cowan Shannon

Where do these students go for field trips?

AGRO 322 Horticultural Techniques plus three hour labs

An introduction to horticultural practice in an experiential learning format. Plant identification, seeding, propagation, pruning, cultivation media, pesticide application and safety are examined in the context of integrated crop management. An additional fee may be required for the pesticide certification examination.

Instructor: Justice Douglas

What do the students do as lab activity for this course right now? Students can apply what have learned onto the garden.

AGRO 460 Advanced Agroecology

Focuses on the relationship between biological diversity and sustainability for the management of agroecosystems. It builds on the core agroecology courses and emphasises ecological interactions between natural ecosystems and agroecosystems, including connections between agroecology and conservation biology. A fee will be assessed each student to cover field trip costs.

Instructor: Sullivan, Thomas; Nichols, Canthleen

AGRO 461 Applied Agroecology plus 1.5hr lab

Analysis and solution of problems in agricultural production systems through the integration and application of agroecological knowledge and principles.

Instructor: Riseman, Andrew; Cheng, Kimberly M

Comment: Since the pre requisite of AGRO 460 and 461 needs AGRO 360, perhaps we can have a project that can be continued?

AGRO 428 Integrated Pest Management

Development and implementation of multi-disciplinary pest management programs in agricultural crops.

Instructor: Yakhtar, Yasmin

Comment: this course is a distance education course, so it would be a good chance for the student to have hands on experience for pest management, since there might be pest problems that students from other class might not be able to solve?

FRE 302 Small Business Management in Agri-food Industries

Builds on business management principles from the Faculty Core. Emphasizes the building of a business plan by exploring topics such as the planning process and financing, marketing and human resource concepts, as applied to an agri-food business. [3-0-1]

I know this course consists of learning how to write a business plan and I do think that the garden needs a business plan because in order for the garden to possibly sell the produce to other places, a business plan is essential.

Instructor: K.Wiseman

FRE 295 Managerial Economics

Economic Foundations of Managerial Decision-making. Organization of the firm, demand theory, cost and production, market structure, competitive strategy, welfare-economic foundations of business regulation. [3-0]

Instructor: J.Vercammen

The students can apply their managerial decision making skills to provide the garden a proposal regarding organization of the garden, cost and production, market structure and etc.

Appendix D: Crop Rotation Plan

Year 1 Crop Rotation			
Bed #	Plot A	Plot B	Plot C
1	Cover Crop	Cover Crop	Cover Crop
2	Carrots	Chard	Winter Squash
3	Beets	Kale	Garlic
4	Parsnips	Cauliflower	Leeks/Onions
5	Lettuce/Arugula/Mizuna/Spinach	Broccoli	Potatoes
6			Beets
7			Carrots

Year 2 Crop Rotation			
Bed #	Plot A	Plot B	Plot C
1	Winter Squash	Carrots	Potatoes
2	Cover Crop	Cover Crop	Cover Crop
3	Garlic	Beets	Kale
4	Leeks/Onions	Parsnips	Chard
5	Beets	Lettuce/Arugula/Mizuna/Spinach	Broccoli
6			Cauliflower
7			Broccoli

Year 3 Crop Rotation			
Bed #	Plot A	Plot B	Plot C
1	Broccoli	Winter Squash	Carrots
2	Cauliflower	Garlic	Beets
3	Cover Crop	Cover Crop	Cover Crop
4	Kale	Leeks/Onions	Parsnips
5	Chard	Potatoes	Lettuce/Arugula/Mizuna/Spinach
6			Lettuce/Arugula/Mizuna/Spinach
7			Leeks/Onions

Vegetables for Production Plots (A,B,C)

Squash; Pac choi; Radishes; Broad beans; Leeks; Onions; Spinach; Lettuce; Swiss chard; Cabbage; Potatoes; Kale; Garlic; Broccoli; Cauliflower; Parsnips;

Herbs

Mint; Cilantro; Rosemary; Dill; Parsley; Chives; Tarragon; Oregano; Lavender; Sage; Basil

Crops for Poly-/Perma-Culture Plot (D)

Strawberries; Rhubarb; Cucumbers; Tomatoes; Grains; Jerusalem Artichokes; Artichokes; Huckleberries; Gooseberries; Cranberries; Raspberries; Asparagus; Lovage; Sorrel; Walking Onions; and numerous flowers.

E. Appendix E: Soil Analysis

Feb 18/2008

PSAI

UBC

Eric Cheng + Art Bonke

SAMPLE	pH	Buffered pH	Dilute Soil To achieve pH 6.5 (hr./100g soil)	C/N Ratio	E.C.	O.M.	Total Nitrogen (%)	AVAILABLE NUTRIENTS (ppm)														
								P	K	Ca	Mg	Cu	Zn	Fe	Mn	B	S					
<i>LFC Garden</i>																						
<i>NATIVE</i>	<i>5.8</i>		<i>50</i>		<i>17.1</i>	<i>0.36</i>	<i>10.1</i>	<i>0.33</i>	<i>49</i>	<i>75</i>	<i>700</i>	<i>80</i>	<i>3.1</i>	<i>12</i>	<i>30</i>	<i>23</i>						
<i>NON NATIVE</i>	<i>7.0</i>				<i>27.9</i>	<i>0.40</i>	<i>9.6</i>	<i>0.20</i>	<i>51</i>	<i>145</i>	<i>3000</i>	<i>155</i>	<i>3.2</i>	<i>13</i>	<i>110</i>	<i>67</i>						
COMMENTS:																						

#5 - 11720 Voyager Way, Richmond, B.C. V6X 3G9 273-8226

G. Appendix G: Consent Form: Stacey Friedman

* All Other Consent forms can be found in the Appendices of other Scenario 5 groups

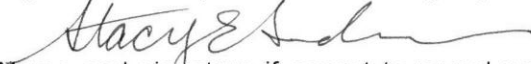
THE UNIVERSITY OF BRITISH COLUMBIA



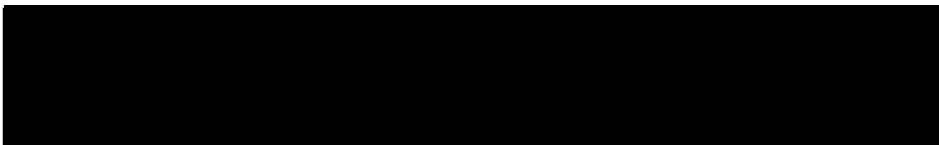
INFORMED CONSENT

I am agreeing to collaborate in the study on The UBC Food System Study conducted by students of the Faculty of Land and Food Systems within their course "Land, Food & Community III (AGSC 450) in collaboration with UBC Food Services, the AMS Food and Beverage Department, UBC Waste Management, Faculty of Land and Food Systems, Centre for Sustainable Food Systems at UBC Farm, the UBC Sustainability Office and its SEEDS Program (Social, economic and ecological development studies).

I have been informed of my right to interrupt any interview or questionnaire linked to this project, at any time that I consider necessary. Also, I have been assured that my answers will remain anonymous unless I provide written permission (below) to the UBC student to disclose my name, working position or any other information revealing my identity in any possible future use of the information I provide.

- Signature of the person volunteering to participate in the study:

- Name and signature if accept to reveal name, revealing my identity (or freely chosen name and signature, if you prefer): *Stacy E. Friedman*
- Contact information if accept to be quoted by name or position in public use of the information I provide to review the quotes:
(Name, Telephone #, fax#, email, mailing address)
- Date:
- Name of the interviewer:

If you have any concern about this study please contact Dr. Alejandro Rojas, Principal Investigator and Course Instructor or Liska Richer Co-Investigator:



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January 30, 2008 version

The Faculty of Land and Food Systems helps make **land, food & community** healthy and sustainable.