

## **The Colgate Community Garden**

A Feasibility Report of a Community Garden at Colgate University

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ENST 480

December 11, 2009

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## **Introduction**

Large-scale agriculture in the United States is an unsustainable industry, associated with a variety of pertinent environmental issues. The industry is environmentally problematic due to its heavy reliance on the consumption of renewable and non-renewable natural resources (Horrigan et al. 2002). Authorities report that food production contributes to 20% of all fossil fuels produced in the United States, an output comparable to the annual emissions of 141 million automobiles (FWW 2009). Agriculture facilitates ecosystem degradation by deteriorating soil and water resources. Although soil and water resources are considered to be renewable, agricultural practices deplete their services faster than they can be replenished, contributing to soil erosion, desertification, and salination (Horrigan et al. 2002). The earth's resources cannot sustain modern agricultural practices, and alternative solutions must be explored in order to secure an ecologically, economically and socially sustainable future for agriculture.

Agricultural sustainability would incorporate the reduced consumption of both renewable and non-renewable resources. Reduced consumption can be achieved through the implementation of alternative agricultural practices, including decreasing fertilizer and pesticide usage, as well as the average distance food travels before reaching the consumer (Vandermeer 1995).

As relatively large-scale consumers, colleges and universities have an opportunity to alter the agricultural industry and pioneer a more sustainable future. Some universities have already implemented programs such as organic farming, composting, community gardens and an agricultural based curriculum in their campus greening initiatives. These universities decrease their environmental impact, encourage good community relations, and foster a land ethic and sense of place within students. For example, at the College of DuPage, students enrolled in an

interdisciplinary course on the study of food – which includes a hands-on gardening component – have reported a sense of accomplishment and a newly perceived connection to the food process. (Adelman and Sandiford 2007)

Community gardens contribute to ecological and economic sustainability, by reducing both greenhouse gas emissions and food prices (O’Hara and Stagl 2001). Further, community gardens promote social sustainability by encouraging participation in the food production process, which contributes to a productive and healthy community (Holland 2004; Schmelzkopf 1995). The Food and Water Watch encourages localized agricultural practices, emphasizing the importance of decreasing food mileage and increasing the frequency of ecologically friendly farms (FWW 2009).

Colgate University, in compliance with the 2009 American College and University Presidents’ Climate Commitment, should implement sustainable agricultural practices, as they encourage carbon neutrality, reduction of waste, sustainable purchasing, and a sustainability curriculum (ACUPCC 2009). A community garden at Colgate will also conform to Colgate’s integrated framework for sustainability. According to Colgate’s Sustainability website, “we welcome our civic duty and embrace our responsibility to be good community partners and stewards of the environment” (CU Sustainability 2009). The garden will foster a culture of sustainability and encourage students to consider the environmental impacts of their actions.

The presence of a community garden will benefit the Colgate community in both the short and long terms. The garden will serve as a place where both prospective and current students can conceptualize sustainability theory in practice. A community garden will help Colgate attract the type of student who is critically involved in his or her own community and also foster this same sentiment in admitted students. The benefits of the garden are aligned with

Colgate's mission of fostering the academic and social growth of well-rounded, informed global citizens. Therefore, the garden is an effective way to demonstrate the way in which Colgate is actively pursuing a liberal arts mission as well as adapting it to the changing global environment.

**The mission of the Colgate Community Garden is to**

- **Serve as an educational medium and expose the campus community to food production and sustainable agriculture**
- **Provide campus members with first-hand experience of working on land through job and volunteering opportunities**
- **Encourage the purchase of locally and organically grown food**
- **Participate, along with the college compost facility, in the campus food cycle**

This paper outlines the factors that must be considered in order to pursue the Colgate Community Garden. The following sections address site choice, garden plan and management, crop selection, irrigation plan, intended use of produce, composting, materials and tools, publicity, budgeting, and timeline. We conclude by providing our recommendations for the ideal garden at Colgate.

**Site Selection**

Site selection is based on specific criteria essential for a successful garden plot. The American Community Garden Association, as well as a number of similar garden start-up organizations, recommends several planning details, four of which are pertinent to Colgate property: sunlight, soil, water, and traffic.

When considering sun exposure, the ACGA recommends that a garden receives at least 6 hours of sunlight a day. Further, the level of sun exposure and intensity should be considered when determining plant placement. Surrounding trees and buildings should be noted, as they may prevent crops from receiving appropriate sunlight. Soil quality will also have a strong impact on the success of particular crops and should be considered when selecting a site. As noted in the Soil Survey of Madison County by the US Department of Agriculture, the

composition of the soil is necessary information for determining appropriate crops and fertilization. Possible hazards pertaining to soil quality include erosion and drought. However, with proper tillage, drainage, and irrigation these concerns can be eliminated. For our project, general information has been gathered on soil type; however, a physical soil test must be completed to assess pH levels and possible contamination.

The final criterion for site selection is garden accessibility and public movement in and around the garden. We want the garden to be easily accessible by foot or bike traffic and also visible to students. Ease of accessibility and visibility will encourage participation of students who would otherwise be unaware of the opportunities the garden has to offer. Further, in case the garden requires irrigation or some sort of supplemental water system, easy accessibility will improve the efficiency of the system.

With these criteria in mind, we located five garden sites on Colgate's campus that best fulfilled these requirements. Those site locations include an unused plot of land behind Tyler's Field; a small area next to the Townhouses, on the Earlville side; the bottom of the ski hill behind Base Camp; a plot on the Old Golf Course; and Colgate-owned farmland outside of town on Lebanon Road. Below is a detailed description of each site.

#### *Tyler's Field Plot*

The potential garden site located behind Tyler's Field is exactly 1 acre in size. It is situated off the road, away from living facilities, and receives at least 8 hours of sun a day. The area does not have any public traffic, decreasing the likelihood of possible vandalism. While the location is somewhat isolated, it is easily accessible for people and trucks delivering supplies and/or equipment. If selected crops require irrigation, water can be gathered and transported from the water source of the nearby stadium.

The soil composition of the Tyler's Field location is suitable for cultivated crops and has a record of minor temporary wetness. Use of cover crops and minimum tillage will help to maintain good soil health. The close proximity to a wetland could cause wet spots, so well-placed drains would benefit the soil.

#### *Townhouse Plot*

The Townhouse plot, slightly smaller than the Tyler's Field site, is 0.3 acres. The plot is visible to the public and easily accessible, which may serve as good publicity for Colgate's greening initiatives. One drawback from this, however, is the high rate of activity among students and community members in the area. The constant action could increase risk of vandalism.

The soil composition is similar to that of the Tyler's Field site. It is well suited for cultivated crops and the use of cover crops would help to maintain productive soil and prevent erosion. Drought may occur midsummer calling for particular attention to irrigation.

#### *Ski Hill Plot*

A third potential garden site, close to the Townhouse site location, is the bottom of the ski hill. The ski hill provides a fairly flat 1.2-acre space that is visible to the public and easily accessible, again serving as positive publicity for Colgate and the promotion of local food production and consumption. The soil is suitable for cultivated crops, particularly early-season and deep-rooted crops. Like other plots, there is a possibility of runoff and of erosion, which can be prevented by the use of cover crops.

The site's close proximity to campus could be beneficial, but also have negative consequences. It is easily accessible for students and close to possible water sources from nearby facilities. However, similar to the Townhouse Plot, it is located near active facilities, such as

Basecamp and Huntington Gym, which may increase non-garden member traffic on or near the garden grounds and, in turn, the likelihood of vandalism.

#### *Old Golf Course Plot*

The Old Golf Course, like the three previously mentioned sites, is appropriate for cultivated crops. This plot is accessible by foot or vehicle roadway and approximately four acres of this area are suitable for growing crops. The incline of the plot may be a possible area of concern. However, a suggested method to deal with this is strip farming. Strip farming is a technique used for steep soil, as it helps to prevent soil erosion and avoid drought. Further, it creates natural dams for water so that important soil nutrients are not washed away.

#### *Colgate-Owned Farmland*

The final potential garden location is located 1.5 miles from campus on Lebanon farmland. The property is over 400 acres in size, which would allow for possible expansion of the community garden and also for a large and productive compost site. While the acreage and fertile soil are encouraging elements for a potential garden, the plot is not easily accessible, particularly for students, and out of sight of the general Colgate public.

### **Garden Plan**

Once our site has been approved it will be measured, a map will be drafted, and the plot area will be outlined. Based on recommendations from Hamilton College garden interns, as well as Chris and Amy from Common Thread Farm, our plot will be approximately a half-acre. A garden of this size will require infrastructural elements such as a fence and a small tool shed. The fence should have a minimum height of six feet, to fend off deer and rabbits. The tool shed should be built or placed next to the plot and contain tools, instruction books, seeds, and any

other necessities for the garden. This shed will also serve as a storage area for harvested produce waiting to be taken to Campus Dining Services or used for other purposes.

The garden design will be very simple. It will have a square shape consisting mostly of straight rows, with ample space between them for several workers to easily maneuver around the garden at once (roughly two feet). However, approximately 1/6 of the garden will be dedicated to 10' x 10' private garden plots. These plots will be for individuals, groups or classes to reserve and manage themselves. These 10' x 10' spaces can be easily manageable, but we are willing to dedicate only a small portion of the garden to this project until we know the level of interest that the campus community will have in managing the plots. These square 10' x 10' plots will be separated from one another and the rest of the garden by wooden partitions, such as stakes or grounded planks.

Additional elements that could be added to the garden for aesthetic and informational purposes will be welcome. Benches could be placed around corners of the garden for people to rest and socialize. Signs could also be placed on the fence or shed to inform visitors of the purpose and name of the garden.

### **Garden Management**

There are three plausible methods of managing Colgate's community garden. The options are 1) having a part-time garden manager, 2) employing students to tend the garden during the summer while relying on volunteers during the academic year, 3) employing students to tend the garden for the entire calendar year. While these options are described below as separate management plans, they are adjustable and could certainly be effective if they were combined.

The most effective way to manage the garden would be to hire a part-time garden manager who is a knowledgeable and experienced gardener or farmer. This manager would be hired to tend the garden and teach students about specific crops and farming techniques for the full calendar year. He or she could do so in a classroom-type setting when the garden is out of season and offer hands-on guidance when it is fully functioning. This individual would be responsible for creating volunteer schedules, overseeing the garden, enforcing the crop harvest program and garden rules, communicating with Campus Dining Services, planning garden related events, and any other managerial duties. A manager would be particularly instrumental in harvesting and tending the community garden and individual plots during the summer months when student aid is minimal.

Another management option would be for the University to hire students as summer interns to tend the garden while most other students are on their summer break. Garden managers from Hamilton College suggested that two or three interns would be sufficient to maintain the garden during the summer months. This strategy would require that volunteers run the garden during the academic year. Currently, there is growing interest among the student community in gardening and agricultural issues. This is illustrated by a student group called “Green Thumbs” that originally formed to start a campus garden and their members are very supportive of the project. For this reason, management of the plot by student volunteers could be a viable option. One obstacle in this management system would be finding enough people who are familiar with agriculture and gardening practices that would be capable and willing to teach and oversee these volunteers. Additionally, some leadership structure would have to be established.

A final option would be for the University to hire or give course credit to student interns during the academic year to ensure that the garden is properly managed. These students would

have the duties of the part-time garden manager described above and would indeed act as the primary garden managers and planners for the subsequent year. They would solicit volunteers from the student body as well as the larger Colgate and Hamilton communities. In addition to these duties they would have to become knowledgeable farmers in all aspects from gardening techniques to understanding crop characteristics and their relationships with soils.

In addition to these options there will also be structural forms of garden management such as written rules and instructions. We have drafted formal bylaws for the garden that would be posted near the plot and enforced by the managing body or individual (see Appendix IV). Standards for garden maintenance and methods for composting will be developed with the help of the garden manager(s). Locks will be placed on the shed and potentially on the fence during hours when the garden would be closed to prevent theft and vandalism.

#### *Management of Individual Plots*

These plots would be made available to Colgate community members for the fall months only, unless the individual or group is able to tend it in both the late spring and summer months. They would have to sign an agreement stating that they will follow the rules set for the garden as a whole as well as those targeting their specific plots. These individuals will also have to pay a small deposit fee that would be returned to them at the end of the season if their plots were regularly weeded and tended to. They would have to work with the garden manager if they would like assistance or advice on planting their crops. This would most likely be the case for many students or students groups, as crops would need to be planted in the later spring or summer months when they may be away from campus.

## Crops

It will be best if the garden is started with a relatively small number (10-12) of crops and herbs, including the most generic ones, which would not be hard to grow. This will allow time for adjusting other garden operations, such as management, workforce, irrigation, garden care, etc. and ensure success of the first harvest. Later, when more experience is gained, the variety of crops can be expanded. The list of crops and general information can be found in the Appendix. This decision extends to the communal part of the garden; for the individual plots whoever is in charge of them will choose the crops, although the garden manager(s) can facilitate seed purchasing.

Gardening in Central New York is characterized by a short growing season, late harvest, and a long harvest of cool-weather crops. Therefore, most planting occurs in late spring to early summer (May-June) and most harvesting takes place in the fall, often extending into November. Hence, there should be enough work force available for harvesting, as students will be on campus, and planting can be aided by starting more perennial (growing more than two years) crops, although we do not recommend it in the first year.

### *Preparing the Soil*

After the site is approved a set of three or four soil samples (taken across the site) will be sent to Cornell Cooperative Extension in Ithaca, NY for testing. It should be indicated that the soil is for growing vegetables; In a few days results will be returned that include soil acidity, nutrient composition and overall recommendations on making the soil more suitable for vegetable gardening. According to the information received, the soil will be prepared. If the pH is lower than 6.5 (very likely for this area), a liming agent will have to be spread over the site. Soil texture and nutrient concentration can be modified by adding organic matter from the

campus compost facility or the garden compost pile. Before planting, soil will need to be tilled. For that, someone from the local community who owns a motor- or electro-powered rototiller can be hired, or a rototiller can be rented from Parry's.

### *Planting*

For each crop, planting time is calculated based on the last frost date for the region. In Hamilton, it is May 31 – June 1. According to general practices and recommendations from local farmers, it is best to first plant seeds in a greenhouse around the third week of March. Transplanting into the ground occurs, depending on the crop, in April through June. Peas, onions, spinach, carrots, and beets can be planted directly into the ground with seeds because they can withstand frost. The Colgate greenhouse can be used to plant the garden crops or, if that does not work out, some space can be rented in the greenhouse of the Common Thread Farm; Chris and Amy were generous to offer this option to us. We can also participate in their joint order of soil for the greenhouse (along with local farmers; contact Chris and Amy by mid-January if interested). In line with the principles of organic gardening, crops should be rotated every year and planting crops from the same family on the same plot should be avoided. Before the garden is started, Chris and Amy will share with us their crop rotation plan as well as review our planting plan and choice of crops.

### *Care for the Crops and Harvesting*

The general maintenance care that the crops will require includes watering on average twice a week depending on the weather (see the Irrigation section for more details), thinning to provide more growing space for individual plants, weeding to eliminate competition with undesired plants, and adding compost to ensure nutrient supply to the roots. Garden staff will perform the previously listed tasks as well as the harvest.

## **Irrigation**

Water, along with sunlight, is essential for plant growth and the garden will need to receive adequate water supplies on a regular basis. Ideally, water for plants comes from rain or other precipitation and from underground sources. In reality, extra watering is often necessary for a healthy harvest. How often the garden will need to be watered depends on several factors: how often it rains, how long the soil retains moisture, and how fast water evaporates in this climate. In terms of precipitation, Hamilton is a rather wet place. Its average annual precipitation is 42.67 inches and the rainfall is evenly distributed throughout the year. The wettest month of the year is September and the driest months are April through May (<http://www.idcide.com/weather/ny/hamilton.htm>). Summers, especially lately, have been wet. The soil at the sites should not have a problem of excessive drainage. Too much moisture could be a problem at the Tyler's Field site but drains can be inserted. In either case, adding organic matter to the soil would help by giving poorly-drained soils lightness and air and well-drained soils something to hold the water. Increased evaporation rates can be a challenge on hot days, which in Hamilton occur usually in the summer, especially in July. Most vegetables and herbs we plan to grow require on average 2 inches of water a week.

Based on everything discussed above we think that installing a full-blown irrigation system is unnecessary at this point. Instead, we propose having a rainwater collection tank on the territory of the garden, from which garden workers could carry water to plants in buckets. Additionally, we can run a garden hose from the closest water source (the building closest to the site or, in the case of the Tyler's Field site, the stadium). If there is ever a lack of water, it can be transported by truck from a nearby water source.

How often the plants are watered will depend on the weather and the specific water demands of the plants grown. Vegetables and herbs are listed in the Appendix and in the Crops section of this Report. Most watering will be needed in April and May, the driest months. However, at this time students are around and workforce availability should not be an issue.

Once the garden is up and running, there may be a need for a more efficient irrigation system in which case we propose drip irrigation. It has been approved by the U.S. EPA as the system that conserves water best. Water drops right near the root zone of a plant in a dripping motion ensuring a reduction in the water loss through evaporation and runoff. A rather low-tech version of it can be installed in the garden. The following video provides a simple guide to it: <http://video.about.com/gardening/Installing-Drip-Irrigation.htm>.

Our approach to irrigation advocates water conservation and efficiency through reduction in losses to evaporation and run-off and maximal utilization of natural processes such as precipitation.

### **Intended Uses of Produce**

We have spoken with Dan Fravil from Sodexo Food Services, who has told us that Sodexo would fully support a community garden on campus. He told us that Colgate Dining Services would gladly purchase the garden produce or would, alternatively, financially support the project in exchange for vegetables. This would only be possible if the garden were insured (see the “Objectives that Need to Be Accomplished” section). He envisioned produce from the campus garden being used regularly in a “feature” dish that would be made mostly using ingredients from the garden. This information would be advertised on a small sign next to the serving station, in an effort to spread awareness of the garden and potentially other local food initiatives.

The garden produce would also be used for other purposes such as community garden dinners, where individuals involved with the project cook meals using garden produce. Many of the vegetables could also be donated to the local food cupboard or food drives, especially during the summer months when they will be plentiful and Colgate Dining Services may have less need. The garden manager(s) in conjunction with Colgate Dining Services would determine the amount of produce designated for use by Colgate Dining Services and other potential purposes.

### **Compost**

Composting is a relatively simple and easy way to reduce the garden's ecological footprint. Composting entails collecting and recycling organic garden waste to use as a rich source of important nutrients for crop growth. Composting reduces garden fossil fuel emissions, by reducing the amount of waste that must be transported from the garden site to a landfill or other holding facility. Further, composting is economically feasible for Colgate because it ensures that garden waste will not add to the landfill fees that Colgate must pay per pound of waste. Along with reducing waste, composting reduces the amount of inorganic fertilizer that might be added to increase crop productivity. Reduction of inorganic fertilizer input has both ecological and economic benefits.

A composting site for garden waste would be relatively small (approx. 10X10 ft) and would ideally be located in close proximity to the garden. Considering the possible sites, a small composting project would be most feasible at the Tyler's Field site, as it is safely out of site and at least 500 ft from residential and academic buildings. The compost site need not be permitted or regulated by the New York Department of Environmental Conservation (NYS-DEC), because

it will be located on Colgate property, and will only be used for the Colgate community. Other requirements for the compost site include a slightly inclined plot to encourage drainage.

As the compost project will be relatively small, it will be managed by Green Thumbs, an environmental group on campus that has agreed to accept responsibility for the project.

Maintenance will be manual and include regular aeration of the pile to encourage decomposition of the waste. Therefore, composting requires little economic investment, as the only necessary tools are shovels.

## **Materials and Tools**

### *Garden Tools*

For work in the garden manual labor philosophy will be applied and machinery will be used only when absolutely necessary, for example in the beginning to till the soil. A set of communal gardening tools will be stored in a tool shed along with instruction books, seeds, and any other necessities for the garden. The tools that will need to be purchased initially include the following (see the Budget section for quantities and prices):

- Spades
  - *spade with a sharp edge* (for turning soil and incorporating organic matter)
  - *round-pointed shovel* (for mixing a compost pile)
- Rakes
  - *bow rake* (for smoothing out soil, removing stones, and breaking up clods)
- Hoes (for preparing the seedbed and for cultivating the soil to mix in fertilizer and control weeds)
  - *square-bladed filed hoe* (good for most garden jobs)
  - *scuffle hoe* (cuts weeds off under the soil surface and breaks up the crust layer on top of the soil)
- Trowels (for transplanting vegetable plants)
- Long-handled cultivators (for breaking up large clods and refining the seedbed)
- Hand-cultivators (for working around vegetable plants and breaking up soil clods for light replanting)
- Wheelbarrow (for moving soil, stones, tools, and harvested vegetables)
- Hand-seeders (for more efficient planting)
- Garden pruners

When the tools are borrowed from the shed, they will need to be signed out. In case of loss or damage, set fees will be applied. The list above is very basic and can be modified by managing staff. The purchase of the tools can be facilitated by Colgate Buildings and Grounds (contact Mike Jasper).

#### *Tool shed*

A tool shed will be built on the territory of the garden, most likely close to the garden entrance. The size of the shed will be 8x15 ft and it will include a covered extension. The design we suggest is called Woodshed built with Duratemp siding (see <http://ssheds.com/> for details). Inside the shed, there will be shelves for tools and instruction books. The shed will be locked and the managing staff will have the key.

#### *Fence*

A 6 ft high wood stockade fence with wooden posts built on the perimeter of the garden will designate the garden limits and shield the garden from wild animals and vandalism. The fence will consist of 8 ft-wide pieces with posts in between (contact Curtis Lumber in Hamilton, NY for details). This type of fence has been recommended by local gardeners as most effective for the purposes outlined. Depending on the shape of the area the maximum possible length of the fence would be around 450 ft.

#### *Other necessities*

In addition to tools, the garden will need to have strings and stakes for row alignment; row covers for protection against cold, insects, and disease; wooden planks for plot designation; a generic trash bin; several sets of garden gloves for workers; two 48 in wooden benches (made out of cedar or tick); and a garden sign at the entrance. The garden sign will indicate that it is the

Colgate University Community Garden and include the mission statement, contact information of the managing staff, and emergency information (e.g. Campus Safety contact information).

## **Publicity**

Action to increase garden awareness can occur through club involvement, relevant academic courses, “Farm-to-Fork” events featuring local farmers, and in the dining hall where garden crops could be served. “Green Thumbs” is a student-led club on campus dedicated to the establishment and maintenance of a Colgate community garden and compost. The current Presidents of the club, who are a part of the class of 2011, have confirmed that club members will serve as gardener volunteers and can inform fellow classmates and faculty of the garden project by word of mouth.

Academic courses, such as the CORE distinction class, Food, could participate in the garden, similar to how the students of the Food course (Fall 2009) volunteered to work at the local community-supported-agriculture farm, Common Thread. Work on the farm is an educational and service opportunity. Students learn how to grow and cultivate certain crops and also come to understand the importance of local sustainable agriculture.

Collaboration with local farmers, such as Chris and Amy, the owners of Common Thread, also creates the opportunity for further education, as farmers could be invited to speak at “Brown-Bags” and share particular knowledge they may have on local agriculture. This again would help to raise awareness of community-supported agriculture and the school garden.

Lastly, the distribution of garden crops in the dining halls would itself be an advertisement. The crops could be labeled to inform students how and where they were grown,

which would hopefully spark some interest in students to either become involved in the garden or simply appreciate the locally grown food.

### **Timeline for Spring 2010**

January (Ideally)

- Test soils, purchase seeds and potting soil with help of Chris and Amy
- Make a detailed garden design
- Advertise individual plots

**February 10: Last day that garden plan can be approved by in order to implement it this growing season**

February

- Build shed, buy tools, rent out plots
- Begin hiring process for summer interns or part-time manager

March

- Buy necessities to plant in greenhouse (potting soil, seeding trays...etc).
- Begin planting some crops in greenhouse
- Look into renting a tilling device or hiring a local farmer

March/April

- Till soil, implement garden design, recruit more volunteers
- Continue planting crops in greenhouse

May

- Garden opening event
- Plant crops

### **Budget**

Cost estimates are based on the prices at Curtis Lumber (15 Eaton Street, Hamilton, NY) and online research done in December 2009. Most tools can be purchased through B&G for wholesale prices. Most cost estimates are thus in the upper range and can be readjusted as needed. The websites used include

- <http://www.ssheds.com/> - for tool sheds
- <http://www.watertanks.com/rainwater-harvesting/> - for rainwater collection tanks
- [http://www.vegetable-gardening-gnomes.com/garden\\_lime.html](http://www.vegetable-gardening-gnomes.com/garden_lime.html) - for information on liming

- <http://www.gardenbenches.net/> - for the design of garden benches and <http://www.chrisharper.com/> for furniture orders
- <http://www.johnnyseeds.com/c-1-vegetable-seeds.aspx> for seeds (possibly wholesale with Common Thread)

The salary for a part-time garden manager is listed at \$10,000, which is a rough estimate based on the salaries of other part-time positions at the University. It should also be noted that if a part-time manager were hired, the presence of two summer interns might not be necessary, although it is preferred. The feasibility of having only one part-time manager and one intern would depend on the willingness of the manager to work long days in the summer months and the amount of support the garden receives from volunteers during the summer break.

Materials and tools:

- spades with a sharp edge - \$3.40 x 2
- round-pointed shovels - \$12 x 2
- garden pruners - \$8 x 2
- bow rakes - \$7 x 2
- square-bladed hoe - \$20 x 1
- scuffle hoes - \$19 x 2
- transplanting trowels - \$6.25 x 3
- hand-cultivators - \$3.35 x 3
- long-handled cultivators - \$15.05 x 2
- wheelbarrow 6 ft 3 (plastic) - \$66 x 1
- hand-seeders - \$40 x 2
- garden gloves - \$2 a pair x 10
- trash bin - \$17.35 x 1

**TOTAL: \$361.05**

Irrigation:

- Rainwater collection tank - \$120
- Buckets - \$4.80 x 3
- Water cans (2 gallon) - \$8.35 x 2
- Garden hoses (150 ft roll) - \$61 x 2
- Extra - \$100

**TOTAL: \$371.30**

## Crops

- Soil testing - \$15 per plot
- Soil tilling - \$100
- Garden lime (5 lbs) - \$2.79 x 110 (for ½ acre)
- Potted soil (8 quarts) - \$4.79 x 10
- Seeds (10 crops) - \$3.50 x 5 packets x 10

**TOTAL: \$629.80**

## Miscellaneous

- Tool shed - \$1,830
- Fence - \$2,500 (with 55 posts) for the maximum perimeter
- String, stakes - \$10
- Plot borders - \$15
- Row covers - \$16 x 3
- Benches (wooden without a back) - \$210 x 2
- Garden sign - \$10
- Extra - \$100

**TOTAL: \$4,933**

## Management

- Summer Intern - \$350 a week x 15 weeks x 2 interns = \$10,500
- Part-time manager (full calendar year position) – \$10,000

**TOTAL: \$20,500**

To summarize, the estimated costs are as follows:

## Start-Up (first year)

- Soil testing - \$15 per plot
- Soil tilling - \$100
- Garden lime - \$306.9
- Irrigation costs - \$371.30
- Materials and tools - \$5,294.05
- Summer Interns - \$10,500
- Part-time Manager - \$10,000
- Seeds - \$175
- Potted soil - \$47.90

**TOTAL: \$26,810.15**

### Annual Maintenance (second and following years)

- Summer Interns - \$10,500
- Part-time Manager - \$10,000
- Seeds - \$175
- Potted soil - \$47.90

**TOTAL: \$20,722.90**

### **Conclusion**

Our first choice for garden location is the Tyler's Field site. The plot would be 1/2 of an acre, 1/6 of which would be designated for University clubs and organizations as well as individual members of the Colgate community. The remaining garden area would be utilized for the growth of vegetables, which would be purchased by the University dining services to be used in the campus cafeteria. A fence would be placed around the garden and a tool shed would serve as a storage unit for communal tools. A part-time manager would be the primary manager of the garden, and student interns would aid in necessary maintenance throughout the summer. Members of "Green Thumbs" would assist in garden maintenance during the academic year. This club and related academic courses, such as CORE Food, would be the primary channels for publicity.

Our report has shown that a community garden is a powerful educational tool that would promote sustainability practices in the Colgate community. An opportunity to connect back to land and learn about real food production would add value to the educational experiences of Colgate students. Moreover, such a sustainable agriculture initiative would help Colgate promote carbon neutral practices, in compliance with the American College and University Presidents' Climate Commitment.

## **Acknowledgements**

We would like to thank all of the people who gave us their time, knowledge, and support during the research component of this project, including Mike Jasper, Dan Fravil, Amy and Chris Babis, Peter Scull, Andrew Pape, Samantha Parry, Christov Churchward, Will Cushman, and Emily Sabo. We would especially like to thank John Pumilio and Bob Turner for providing us with much needed guidance and support throughout the entirety of the project.

## **Objectives that Need to Be Accomplished**

1. **Soil Testing.** Soil samples of each plot need to be sent to Cornell Cooperative Extension. They will test the soils for nutrients as well as heavy metals for a minimal charge. It is extremely important to test the soils for toxins especially, because such substances could easily contaminate the produce and possibly harm the individuals who consume it.
2. **Insurance.** Dan Fravil from Sodexo Food Services has made it very clear that in order for Sodexo to purchase or accept produce from the campus garden, it would have to be covered by an insurance plan. The garden could be insured either by the University plan or, at a substantial cost, by a private company. As Sodexo will be our largest supporter, we think that insurance is a key issue.
3. **Security.** Once the garden has been established Campus Safety should be notified about the garden. Depending on the remoteness of the site and the management type, the garden manager(s) may want to discuss safety concerns with representatives from Campus Safety.
4. **Greenhouse.** Many of the crops proposed for the garden require the use of a greenhouse in the early spring. The representative from the biology department that manages the greenhouse should be contacted and asked if space could be allotted for the Colgate

Community Garden. If so details concerning watering, planting, seed trays, and purchasing of potting soil need to be worked out.

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## *Appendix A*

### **List of Contacts**

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## *Appendix B*

Vegetables and their growing season in Central New York  
(<http://localfoods.about.com/od/searchbyregion/a/nyseasons.htm>)

Asparagus, May and June

Beets, June through December

Blueberries, July and August

Broccoli, June through November

Broccoli raab, August through November

Brussels sprouts, September through November

Cabbage, June through October

Cantaloupes, August and September

Carrots, June through September (local harvest available from storage through March)

Cauliflower, August through November

Celeriac/celery root, September through November

Celery, August through October

Chard, May through November

Chicories, September and October

Corn, June through August

Cranberries, October through December

Cucumbers, July through October

Currants, August

Eggplant, July through October

Escarole, September and October

Fava beans, May and June

Fiddleheads, April and May

Garlic, July through October (stored year-round)

Garlic scapes/green garlic, May and June

Green beans, July through September

Green onions, May through September

Kale, June through November

Kohlrabi, June and July, September and October

Leeks, August through December

Lettuce, May through October

Melons, July through October

Morels, spring

Nectarines, August and September

New Potatoes, May

Onions, July through October (stored in winter)

Parsnips, April and May and again October through December

Pea greens, April through June

Peas and pea pods, July through October

Peppers (sweet), July through October

Potatoes, July through December (available from storage year-round)

Pumpkins, September through November

Radicchio, September and October

Radishes, May through September

Raspberries, July through September

Rhubarb, May through July

Rutabagas, August through November

Scallions, May through September

Shelling beans, September through November

Snap peas/snow peas/pea pods, June through September

Spinach, May through September

Spring Onions, May and June

Squash (summer), July through September

Squash (winter), August through December

Strawberries, June

Tomatoes, July through September

Turnips, August through November (local harvest available from storage through the winter)

Watermelons, August through October

Winter Squash, August through December

Zucchini, July through September

Zucchini Blossoms, June and July

## Appendix C

Herb Description, Culture, and Harvesting (modified from West Virginia University Cooperative Extension Services of the Northeast States  
<http://www.wvu.edu/~agexten/hortcult/herbs/ne208hrb.htm#Definition,%20Number,%20and%20Types%20of%20Herbs%20Available>)

### **Anise** (*Pimpinella anisum*)

#### **Description**

Anise is a dainty annual that grows from 1 to 2 feet high. It has finely cut, serrated leaves and very small, whitish flowers in flat clusters. The leaves and seeds have a warm, sweet taste that suggests licorice.

#### **Culture**

Anise grows rapidly from seed. Plant after all danger of frost has passed. If planted in rows, thin to 6 to 8 inches apart in rows 2 feet apart.

#### **Harvesting**

The green leaves can be cut whenever plants are large enough. Gather seeds about 1 month after flowers bloom.

---

### **Basil (Sweet)** (*Ocimum basilicum*)

#### **Description**

Basil is an attractive annual, about 18 inches tall with light-green, fairly broad leaves. The flowers are small, white, and appear in spikes. There are several species of cultivated basil, one having purple leaves.

#### **Culture**

Basil grows easily from seed planted after all danger of frost has passed. Pinch stems to promote bushy, compact growth. Avoid lush growth as it may reduce the flavor.

#### **Harvesting**

Green leaves can be picked about 6 weeks following planting. It is best to cut leaves for drying just before flowers open.

---

## **Borage** (*Borago officinalis*)

### **Description**

Borage is a decorative annual with coarse, hairy leaves and stems and beautiful sky-blue flowers in a star shape. The plant grows about 2 to 3 feet tall.

### **Culture**

Borage is easily grown from seed and will sow itself. This plant does best in dry, sunny places. Although it is difficult to transplant, you can stretch out the harvest by sowing three times at 4-week intervals.

### **Harvesting**

Pick blossoms as they open. Use leaves fresh anytime; they are seldom dried.

---

## **Caraway** (*Carum carvi*)

### **Description**

Caraway is a biennial plant that grows about 30 inches tall. The flowers appear in flat, white clusters and, like the finely cut leaves, resemble those of carrots.

### **Culture**

Caraway can be easily raised from seed. Usually, plants do not bear seed the first year they are planted, but if planted in the fall, they will bear seed the following year. This herb is not easily transplanted. If sown in rows, thin to 8 to 12 inches apart in rows 3 feet apart. Protect roots with mulch in winter.

### **Harvesting**

Seeds can be picked when ripe, about a month after flowering, when they are grayish-brown in color.

---

## **Catnip** (*Nepeta cataria*)

### **Description**

Catnip is a hardy perennial plant that grows 3 to 4 feet tall. The heart-shaped leaves are green above and gray below. The plant has purple flowers.

### **Culture**

Catnip is a hardy plant that will grow in sun or shade. It can be grown from seed or propagated by division. When young, the plants are decorative. As they grow older, however, they become scraggly. It's best to plant catnip as a background plant.

**Harvesting**

Cut and dry the mature leafy tops and leaves.

---

**Chervil** (*Anthriscus cerefolium*)**Description**

Chervil is an annual plant that grows up to 2 feet tall. It's lacy leaves resemble parsley but are a lighter shade of green. The flat heads have delicate white flowers.

**Culture**

Chervil can be raised from seed sown in the garden in early spring. Seedlings are difficult to transplant. Thin plants 3 to 4 inches apart. For denser foliage, cut the flower stems before they bloom.

**Harvesting**

Pick leaves just before the buds break. Cut and dry the green, tender leaves.

---

**Chives** (*Allium schoenoprasum*)**Description**

Chives are small, dainty, onion-like plants that grow in clumps reaching about 10 inches in height. They are a hardy perennial with decorative, light purple flowers.

**Culture**

Chives demand little care other than dividing when they become overcrowded. They are easily propagated by division or from seed and make attractive border plants.

**Harvesting**

Cut fresh leaves for use as they grow.

---

**Coriander** (*Coriandrum sativum*)**Description**

Coriander is a dainty annual plant that grows about 2 feet tall. It has finely divided leaves that are both strong-smelling and ill-tasting. Small white or purplish-tinged flowers appear in small, flat heads.

**Culture**

Coriander is easily grown from seed sown in the garden in spring. This plant does well in any good garden soil. Thin plants 7 to 10 inches apart.

**Harvesting**

Harvest plants when 6 inches high or pick leaves sparingly when plants are 4 to 6 inches tall. Gather seeds as they ripen in mid-summer.

---

**Dill** (*Anethum graveolens*)**Description**

Dill, a popular annual, has bluish-green stems that contrast with finely divided, yellow-green, plume-like leaves and yellowish flowers. Dill grows about 2 to 3 feet high.

**Culture**

Dill is easily grown from seed sown in the garden in spring after all danger of frost has passed. Sow the seed where you want it to grow as it is difficult to transplant. Stake tall plants.

**Harvesting**

For best results, pick leaves just as flowers open. Pick seeds when they are flat and brown.

---

**Fennel (Florence)** (*Foeniculum dulce*)**Description**

Fennel is a perennial (but usually grown as an annual) that grows to about 3 to 4 feet tall. The leaves are finely divided into thread-like segments and are light green.

**Culture**

Fennel grows easily from seed planted in the garden in spring. Sow in full sun. Space rows 3 feet apart. Thin plants 10 to 12 inches apart and stake when 18 inches tall to protect from wind.

**Harvesting**

Pick seeds when ripe. The best stems for eating are the tender flower stalks just before they blossom.

---

**Horehound** (*Marrubium vulgare*)**Description**

Horehound is a somewhat coarse perennial plant that is covered with a whitish down. The leaves are crinkled and tend to turn downward.

**Culture**

Horehound grows well in light soil and withstands full sun and intense heat. It is a hardy plant but needs protection where winters are very cold. Horehound can be propagated from seed,

cuttings, or by division. Because of its weedy growth habits, it is best to place this plant in the background.

### **Harvesting**

Leaves and small stems can be cut in May before plants bloom.

---

## **Hyssop** (*Hyssopus officinalis*)

### **Description**

Hyssop is a hardy perennial that grows no more than 2 feet tall. It has woody stems, small pointed leaves, and spikes of small purple flowers. There also are forms with pink or white flowers. If kept clipped, it makes a good border or small hedge.

### **Culture**

Hyssop will grow in rather poor soil and is easily propagated from seed. When it is established, it is a quite hardy plant.

### **Harvesting**

Use the youngest leaves and stems as needed.

---

## **Lavender** (*Lavandula vera*)

### **Description**

Lavender is a many-branched, somewhat woody, perennial plant growing 1 ♦ to 3 feet tall. The narrow leaves are about 2 inches long and have a pleasing gray-green color. The small lavender flowers are borne on long-stemmed, slender spikes.

### **Culture**

Lavender grows best in rocky, dry, sunny places with an abundant amount of lime in the soil. It can be propagated by seed or cuttings. If winters are severe, the plant needs protected.

### **Harvesting**

Cut whole flower spikes when the first flowers begin to open, and dry.

---

## **Lovage** (*Levisticum officinale*)

### **Description**

Lovage is a hardy perennial with large, rich green leaves that resemble those of celery. The leaves are stronger tasting, but sweeter than celery.

**Culture**

Lovage does best in a rich, fairly moist soil and can be propagated from seed planted in late summer.

**Harvesting**

Use the leaves fresh, or dry them at any time.

---

**Marjoram (Sweet) (*Marorana hortensis*)****Description**

Sweet marjoram, usually grown as an annual, is one of the most fragrant and popular of all herbs. Its growth habit is low and spreading, and it reaches a height of about 8 to 12 inches. It has small, oval, gray-green leaves that are velvety to the touch.

**Culture**

This plant can be easily grown from seed or cuttings. In colder climates, it is best treated as an annual or kept overwinter as a pot plant. Its color makes it an attractive border plant.

**Harvesting**

Sweet marjoram leaves can be used anytime. Cut the leafy stems at flowering and dry for future use.

---

**Oregano (Wild marjoram) (*Origanum vulgare*)****Description**

Oregano, also called "wild marjoram," is a hardy perennial that has sprawling stems which can grow to 2 feet tall. This plant is much coarser than sweet marjoram and smells more like thyme. It has small pink or white flowers.

**Culture**

Oregano grows well in poor soil and can be propagated by seed or division. Thin plants 10 to 12 inches apart. Stimulate foliage by cutting back flowers. Replant when plants become woody in 3 to 4 years.

**Harvesting**

Use fresh leaves as needed. Preserve leaves by drying.

---

**Parsley (*Petroselinum crispum*)**

**Description**

Parsley is a hardy biennial that is usually treated as an annual. It is popular because of its much-divided, sometimes curly leaves which have a characteristic flavor and smell.

**Culture**

Cut parsley when the leaves are of suitable size. Leaves can be used fresh or dried.

---

**Peppermint** (*Mentha piperita*)**Description**

Peppermint is a perennial plant with spreading rootstalks and many upright stems 2 feet or more in height. Its dark green leaves and reddish-tinged stems have a characteristic warm, spicy scent. Tiny purplish flowers appear in thick terminal spikes 1 to 3 inches long.

**Culture**

Peppermint does best in a rich, moist soil. Propagate by division or cuttings. The plant will grow in sun or shade. It is best to renew beds every 3 to 4 years.

**Harvesting**

The more frequently the sprigs are cut, the better the growth. Use leaves at any time. Leaves to be dried are best taken just as flowers begin to appear.

---

**Rosemary** (*Rosmarinus officinalis*)**Description**

Rosemary is a hardy evergreen shrub in areas where winter temperatures stay above 5°F (-15°C). In the Northeast, however, this perennial should be taken indoors and kept as a pot plant during winter. The narrow leaves have a leather-like feel and a spicy, resinous fragrance.

**Culture**

Rosemary grows best in well-drained, sunny locations in lime-rich soil. It can be propagated by cuttings or grown from seed. Pinch the tips to direct growth.

**Harvesting**

Use fresh leaves as needed.

---

**Sage** (*Salvia officinalis*)**Description**

Sage is a woody, hardy perennial plant with oblong, wooly, gray-green leaves that are lighter

underneath and darker on top. Sage grows 2 to 3 feet or more in height and has a tendency to sprawl.

### **Culture**

Start from seed or cuttings. A slow starter, sow seed indoors and transplant. Plant sage where it will receive full sun. Space plants 2 to 2 ½ feet apart. Plants eventually become woody and should be renewed every 3 to 4 years.

### **Harvesting**

Pick the leaves before or at blooming. Cut back the stems after blooming.

---

## **Savory (Summer) (*Satureja hortensis*)**

### **Description**

Summer savory is a tender annual that grows up to 18 inches tall. It has small bronze-green leaves and very small white or lavender flowers. The leaves are pungent and spicy.

### **Culture**

Summer savory grows best in a well-worked loamy soil. Seed can be planted in the garden in spring.

### **Harvesting**

Cut leafy tops when the plants are in bud. Hang in an airy, shaded place until crisp and dry.

---

## **Savory (Winter) (*Satureja montana*)**

### **Description**

Winter savory has dark green, shiny, pointed leaves much stiffer in texture than summer savory. It is a woody perennial plant growing to 2 feet in height with small white or lavender flowers.

### **Culture**

Winter savory does best in a light, sandy soil. Keep dead wood trimmed out. Propagate by cuttings or raise from seed.

### **Harvesting**

Pick young shoots and leaves at any time. The leaves are almost evergreen but not as pungent in winter. It is best dried for winter use.

---

## **Spearmint (*Mentha spicata*)**

**Description**

This hardy perennial plant has pointed, slightly crinkled leaves that are a lighter shade of green than peppermint. The whole plant has a sweet characteristic smell.

**Culture**

Spearmint grows best in a somewhat moist soil and can be propagated by cuttings or division. Renew beds every 3 to 4 years. Growth is enhanced by frequent cuttings.

**Harvesting**

Pick the fresh leaves and leafy stem tips for use at any time. For drying, it is best to cut leaves just as flowering begins.

---

**Tarragon** (*Artemisia dracunculus*)**Description**

Tarragon is an herbaceous perennial that grows to about 2 feet tall. It has multibranched growth with narrow, somewhat twisted, green leaves.

**Culture**

Tarragon will grow in full sun but seems to do better in semishade. It can be propagated from root cuttings or by division. It needs protection in winter in cold climates. Make new plantings every 3 to 4 years.

**Harvesting**

It is best to use fresh young leaves and stem tips. Flavor is lost when tarragon is dried.

---

**Thyme** (*Thymus vulgaris*)**Description**

Thyme is a low-growing, wiry-stemmed perennial that reaches about 6 to 10 inches in height. The stems are stiff and woody and leaves are small, oval, and gray-green in color. The lilac flowers are borne in small clusters and the leaves are very aromatic.

**Culture**

This plant grows best in light, well-drained soil. Thin plants 8 to 12 inches apart. It is best to renew the plants every few years. Propagate with cuttings, divisions, or by direct seeding. Thyme is an attractive edging plant or a spreading plant among and over rocks.

**Harvesting**

Cut leafy tops and flower clusters when first blossoms open and dry.

---

## **Woodruff (Sweet)** (*Asperula odorata*)

### **Description**

Sweet woodruff is a low, spreading, perennial plant that forms clumps about 8 inches in height. The slender leaves are borne in starry whorls. The flowers are tiny and white and form in loose clusters. When the plant is crushed, it has a sweet scent similar to freshly mown hay and vanilla.

### **Culture**

Sweet woodruff can be grown as a perennial if winters are not too severe, but it needs winter protection or should be taken indoors in cold climates. It will thrive in semishade and makes an attractive ground cover under taller plants.

### **Harvesting**

Harvest and dry plants in the spring when fragrance is the strongest.

## *Appendix D*

### General Garden Rules

1. No debris of any kind should be left at the site. Use trash receptacles available next to the gardens.
2. Dispose of weeds and plant materials in designated compost areas.
3. Keep rocks out of pathways and borders. They make mowing impossible. Put them in the designated area.
4. Borrowed tools should be cleaned and returned to the storage area when done. Tools are not to be taken home overnight.
5. Any items borrowed from the tool shed (tools, books, containers) should be signed out on the form and upon any damage pre-determined fees will be applied.
6. If vandalism or theft occurs, notify the garden committee immediately.
7. Keep gates in the garden closed at all times.
8. The bulletin board is a way for all of us to stay in touch. Please use it for any garden-related purposes.
9. If you have any questions, suggestions, or complaints, please contact one of the garden committee members.
10. We encourage you to attend Green Thumbs meetings throughout the year.
11. Your compliance with the above regulations will help everyone have an enjoyable and prosperous garden. Failure to comply with above regulations during the season may result in a loss of future gardening privileges.

### Additional Rules for Individual Plot Managers

1. Plot corners are clearly marked with stakes. Do not remove these stakes during the season. Metal stakes throughout the site are permanent boundary markers and should not be moved.
2. We request that all members volunteer their time for general maintenance (especially adjacent walkways) to keep the garden site looking good. The use of the site is contingent on our ability to maintain it. Check the bulletin board for chores that need to be done.
3. All plots will be inspected three times. Managers of plots that have not been planted, are weedy, or do not meet the guidelines will be notified. Failure to respond within 14 days will result in forfeiture of the plot.
4. Use of herbicides and black plastic mulches is prohibited.
5. Notify the garden coordinator if you are no longer able to tend your plot, will be absent for a long period of time, or have asked a friend to tend your garden.
6. Cleanup deposits will be refunded after your plot is cleaned in the fall and approved by the garden committee.

*Appendix E*

*MAPS*



Figure I: Aerial view of the four garden sites on Colgate Campus



Figure II: Aerial photograph of Lebanon Farm Site and the Colgate University Campus